WM-FX251

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model

Photo: US, Canadian model

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MF-WMFX251-114

SPECIFICATIONS

- **Frequency range**
  FM: 87.5-108MHz (0.1MHz step) (US, Canadian)
  FM: 87.5-108MHz (0.05MHz step) (AEP, Italian, E, Mexican)
  FM: 65.0-74, 87.5-108MHz (0.05MHz step) (East European)
  AM: 530-1710kHz (10kHz step) (US, Canadian)
  AM: 531-1602kHz (9kHz step) (EXCEPT US, Canadian)
- **Power requirements**
  3V DC batteries AA (R6) × 2/External DC 3V power sources
- **Power Output**
  Headphones: 8mW+8mW (US, Canadian, 2CE7)
  Earphones: 5mW+5mW (EXCEPT US, Canadian, 2CE7)
- **Dimensions**
  115 × 90.5 × 34.4mm (4 5/8 × 3 5/8 × 1 3/8 inches) (w/h/d) incl. projecting parts and controls
- **Mass**
  Approx. 150g (5.3 oz)
  Approx. 245g (8.7 oz) incl. batteries, a tape and earphones (EXCEPT US, Canadian, 2CE7)
  Approx. 285g (10.1 oz) incl. batteries, a tape and headphones (US, Canadian, 2CE7)
- **Supplied accessories**
  Stereo headphones (1) (US, Canadian, 2CE7)
  Stereo earphones (1) (EXCEPT US, Canadian, 2CE7)
  Carrying case (1)

Design and specifications are subject to change without notice

- **Abbreviation**
  2CE7: Headphone (MDR-023) supplied with this set in AEP model.

RADIO CASSETTE PLAYER

MICROFILM

SONY®

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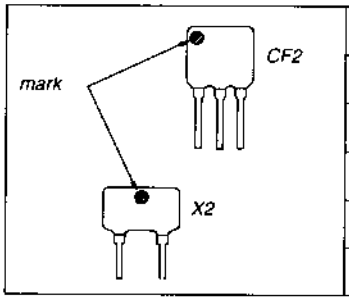
SERVICING NOTES

HOW TO CHANGE THE CERAMIC FILTERS

This model is used two ceramic filters of CF2 and X2.
You must used same type of color marked ceramic filters in order to meet same specifications.
Therefore, the ceramic filter must changed two pieces together since it's supply two pieces in one package as a spare parts.



Mark	Center frequency
red	10.70MHz
blue	10.67MHz
orange	10.73MHz
black	10.64MHz
white	10.76MHz

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

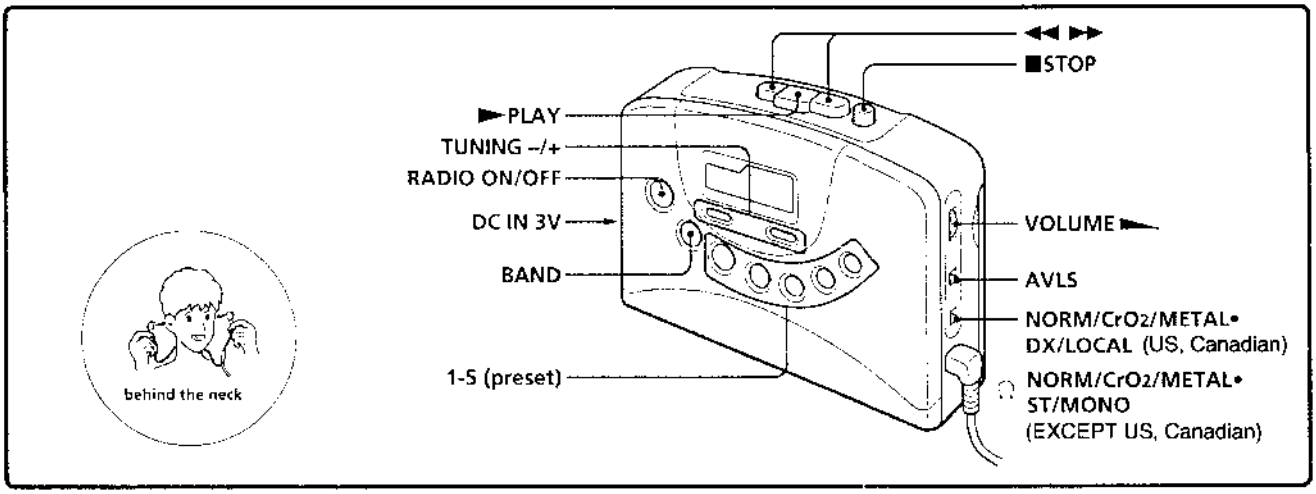
Notes on chip component replacement

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

SECTION 1
GENERAL

This section is extracted from instruction manual.

Location of parts and controls



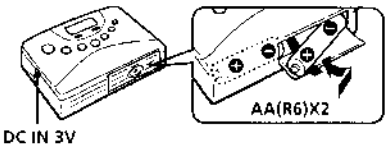
Precautions

- Do not leave the unit in a location near heat sources, or in a place subject to direct sunlight, excessive dust or sand, moisture, rain, mechanical shock, or in a car with its windows closed
- Do not wind the headphones cord around the unit. The buttons may be kept pressed, causing unnecessary battery usage.
- Do not use cassettes longer than 90 minutes except for long continuous playback.
- If the unit has not been used for a long time, set it in the playback mode to warm it up for a few minutes before inserting a cassette.
- For cleaning the case, use a soft cloth slightly moistened with mild detergent solution. Do not use alcohol, benzine or thinner.

If you have any questions or problem concerning your Walkman, please consult your nearest Sony dealer.

Preparations

To insert batteries

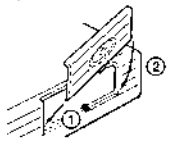


Battery life (approximate hours)

	Sony alkaline LR6 (SG)	Sony R6P (SR)
playback	22	7
radio	33	13

Notes

- When you do not use the unit for a long time, remove the batteries to prevent damage from battery leakage and corrosion.
- When the batteries become weak, the sound will be unstable or cannot be heard. In such case, replace both batteries.
- When replacing batteries, replace both batteries within 30 minutes; otherwise all the memories will be canceled.
- If the battery compartment lid comes off, attach it as shown.



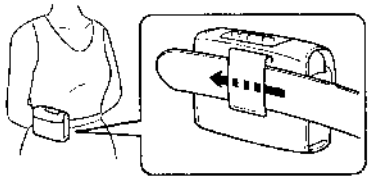
To use external power

- For house current: Connect AC-E30HG AC power adaptor (not supplied) to the DC IN 3V jack.

The polarity of the plug

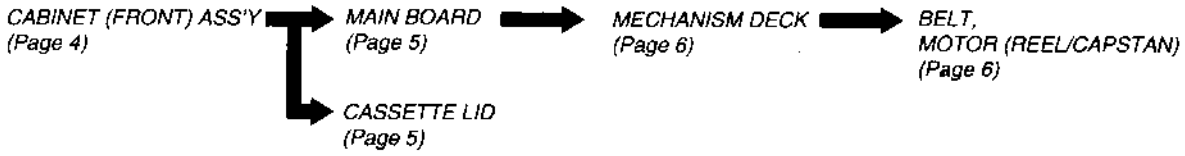
- For 12V/24V car battery: Connect the recommended DCC-E130L or DCC-E230 car battery cord to the DC IN 3V jack.

To use the carrying case



SECTION 2
DISASSEMBLY

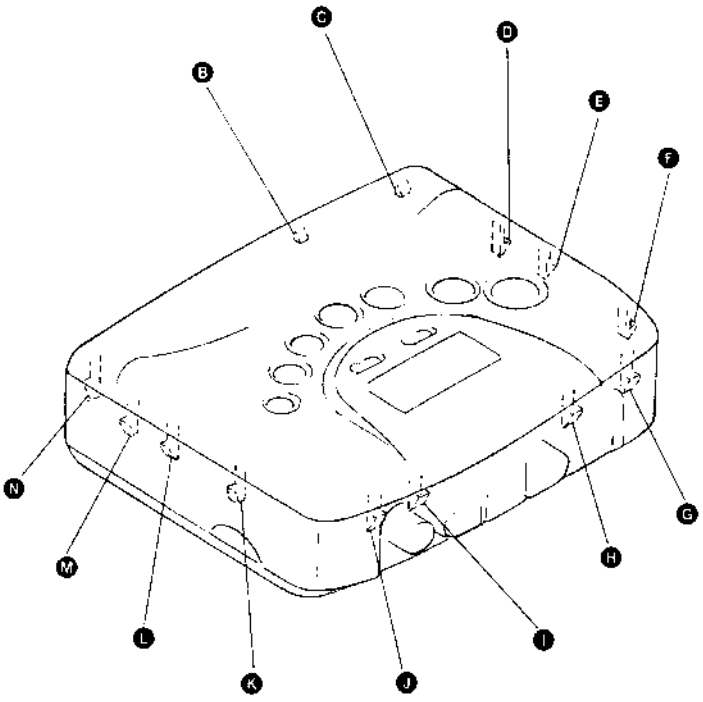
• This set can be disassembled in the order shown below.

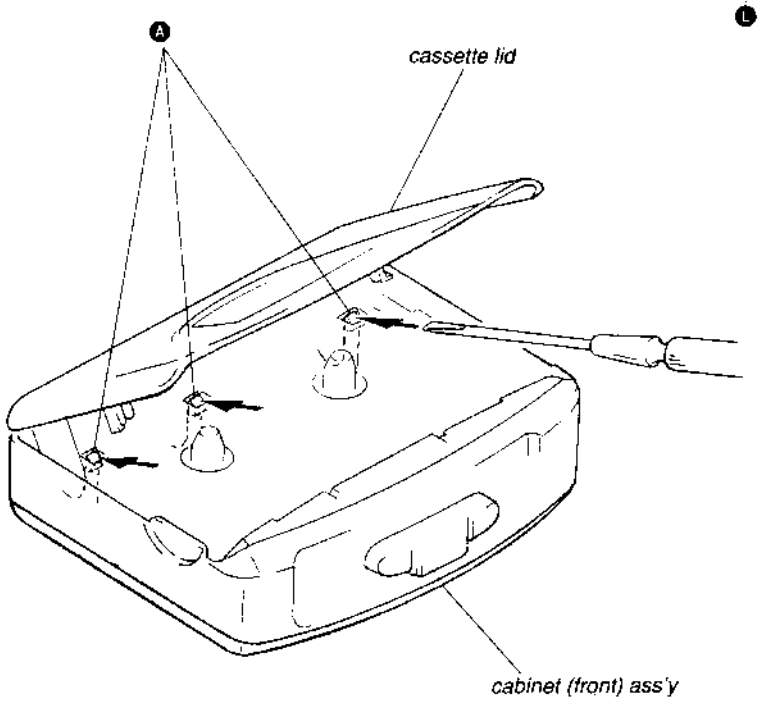


Note: Follow the disassembly procedure in the numerical order given.

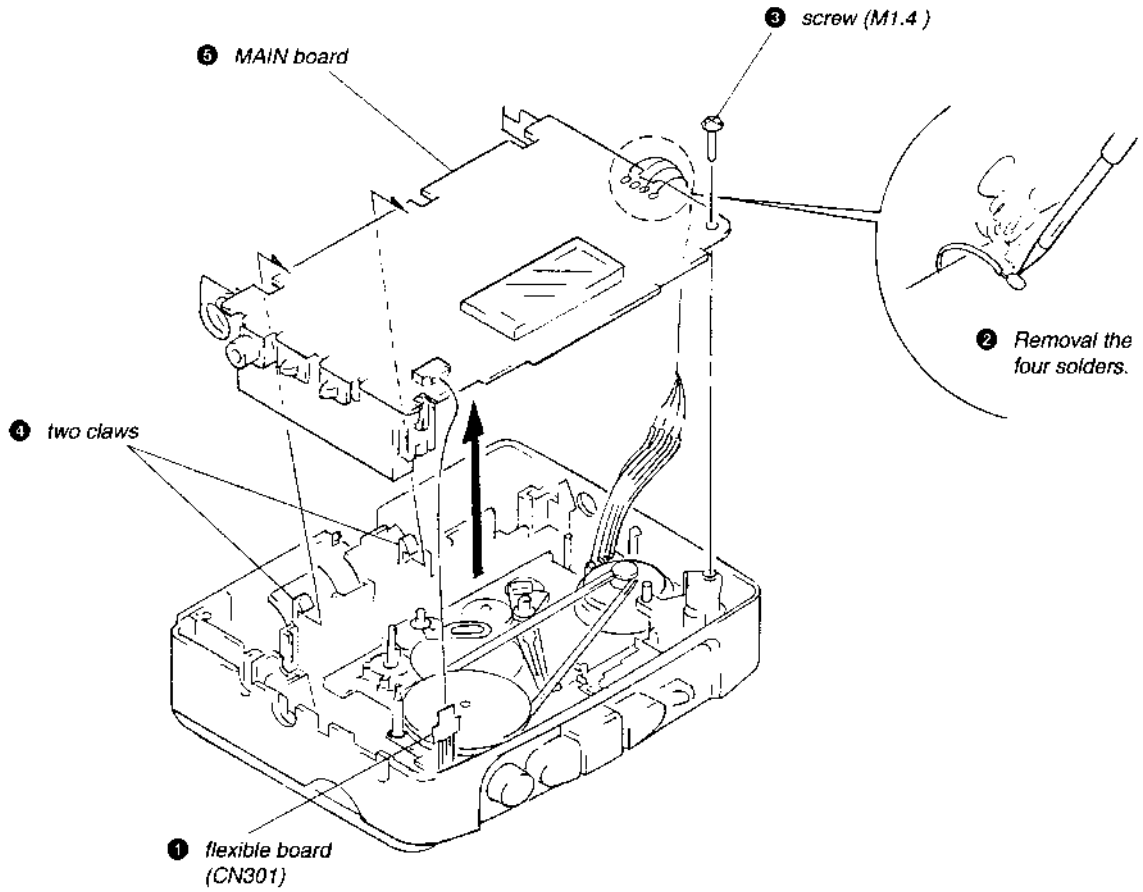
CABINET (FRONT) ASS'Y

❶ *Insert the precision screwdriver (1.4 mm flat-blade) in to the slit at claw Ⓐ and release the claw.*
❷ *Remove the cabinet (front) ass'y. (Release all claw Ⓑ to Ⓝ in alphabetical order.)*



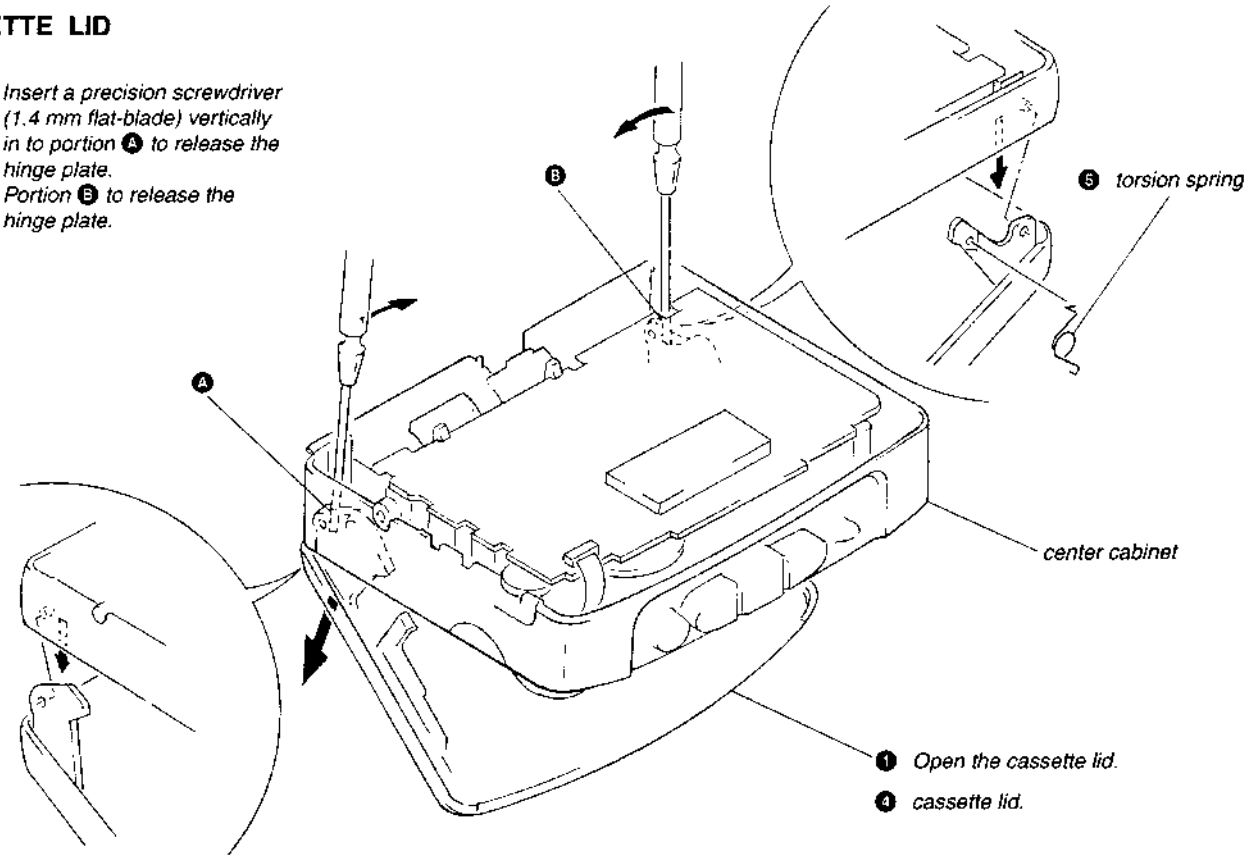


MAIN BOARD

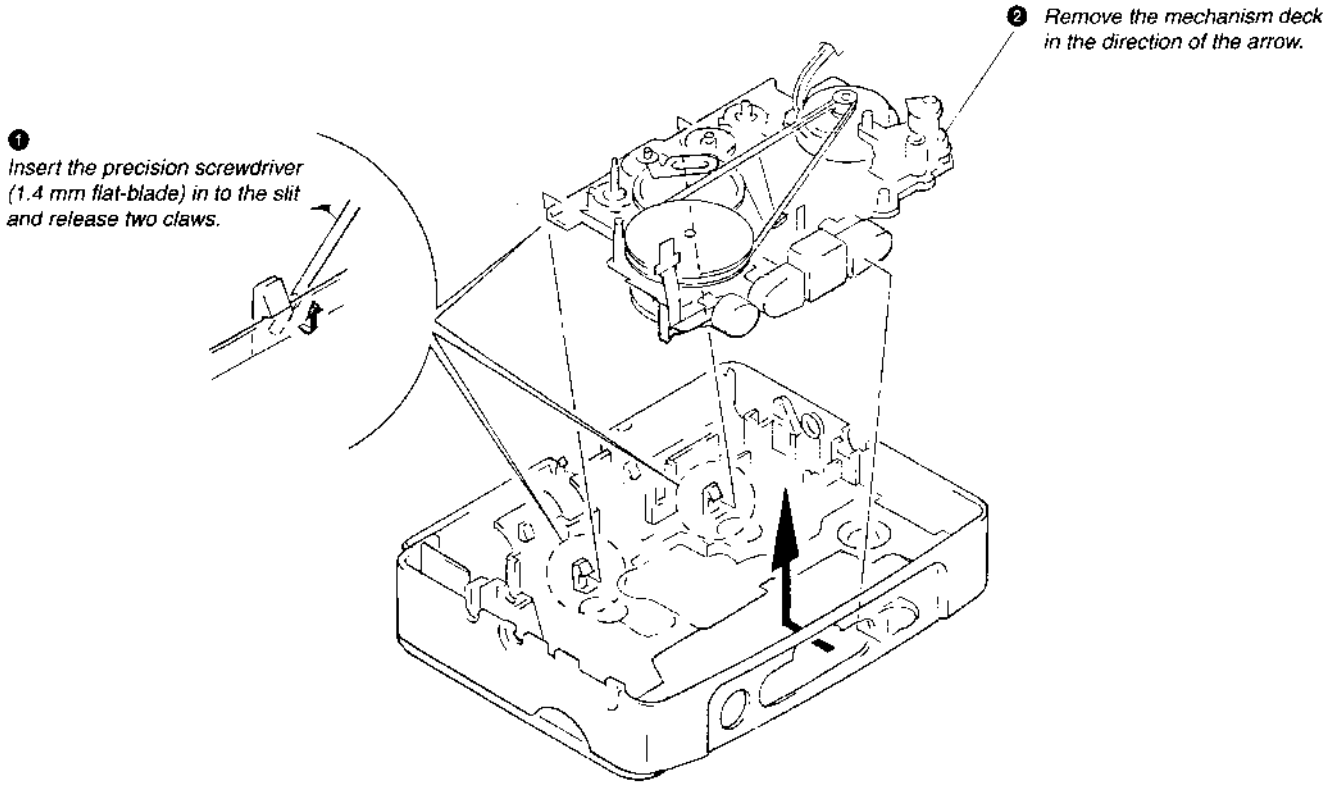


CASSETTE LID

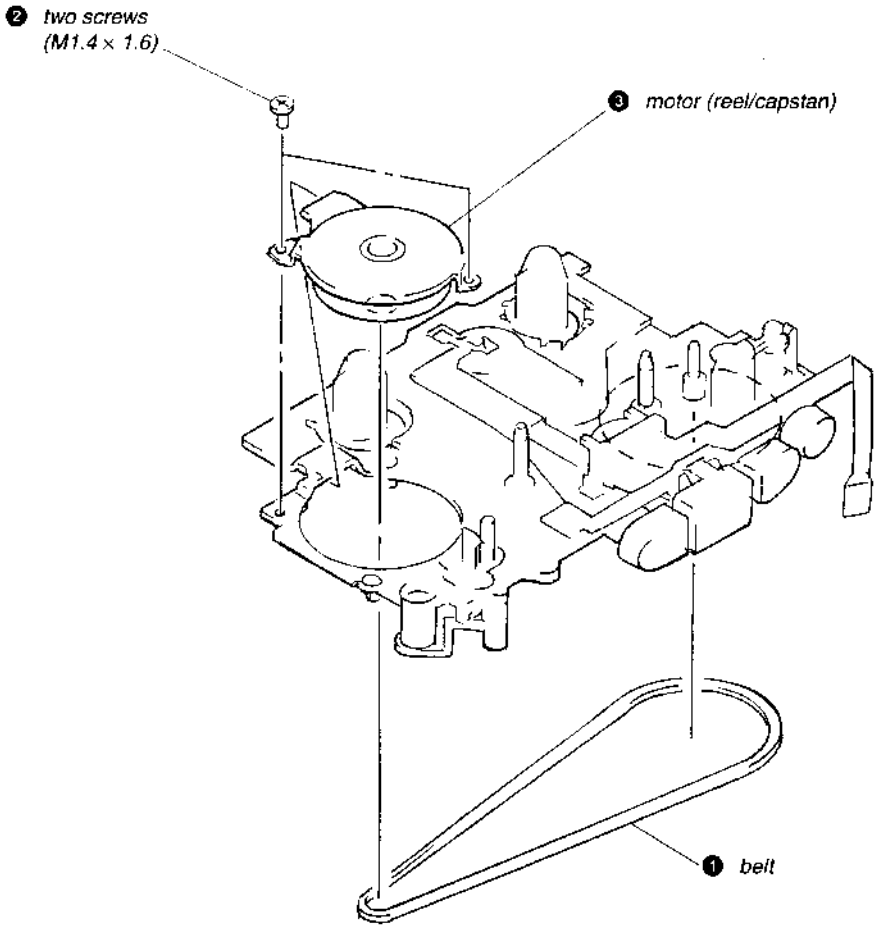
❷ Insert a precision screwdriver (1.4 mm flat-blade) vertically in to portion Ⓐ to release the hinge plate.
❸ Portion Ⓑ to release the hinge plate.



MECHANISM DECK



BELT, MOTOR (REEL/CAPSTAN)



SECTION 3
MECHANICAL ADJUSTMENTS

Precaution

1. Clean the following parts with a denatured-alcoholmoistened swab:
   playback head pinch roller
   capstan rubber belt
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 (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torqu Meter	Meter Reading
FWD	CQ-102C	20 – 42 g•cm (0.28 – 0.58 oz•inch)
FWD Back Tension		less than 2 g•cm (less than 0.03 oz•inch)
REV	CQ-102RC	20 – 42 g•cm (0.28 – 0.58 oz•inch)
REV Back Tension		less than 2 g•cm (less than 0.03 oz•inch)
FF, REW	CQ-201B	more than 60 g•cm (more than 0.83 oz•inch)

SECTION 4
ELECTRICAL ADJUSTMENTS

Precaution

- Supplied voltage: 2.5 V
- Switch and control position
  TAPE switch: NORM
  RADIO switch : ST(Except US, Canadian model)
  : DX (US, Canadian model)
  VOLUME CONTROL: maximum
  AVLS switch: NORM

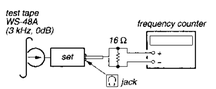
Test tape

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	Tape Speed Adjustment

TAPE SECTION

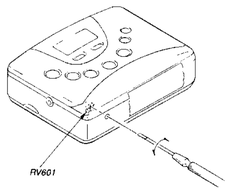
Tape Speed Adjustment

Procedure:



1. Playback WS-48A (tape center part) in the FWD state and adjust RV601 so that the frequency counter reading becomes 3,000 ± 15 Hz.
2. Playback WS-48A (tape center) in the REV state.
   Check that the frequency counter reading is within ± 1.0 % of the reading of step 1.

Adjustment Location:

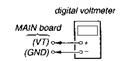


TUNER SECTION

FM SECTION

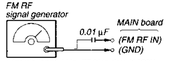
Setting:
FUNCTION switch: RADIO
BAND switch: FM

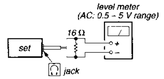
FM Tuning Voltage Adjustment



FM TUNING VOLTAGE ADJUSTMENT
Adjust for a 9.0 +0.5 −0 (14.5 ± 0.5) Vdc reading on digital voltmeter.
L3
108 MHz

FM Tracking Adjustment





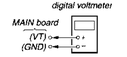
FM TRACKING ADJUSTMENT
Adjust for a maximum reading on level meter
L2
87.5 (65.0) MHz

( ): East European model

AM SECTION

Setting:
FUNCTION switch: RADIO
BAND switch: AM

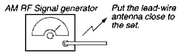
AM Tuning Voltage Adjustment

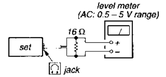


AM TUNING VOLTAGE ADJUSTMENT
Adjust for a 1.4 ± 0.1 Vdc reading on digital voltmeter
L4
530 (531) kHz

( ): Except US, Canadian model

AM IF Adjustment, AM Tracking Adjustment





* Repeat the procedures in each adjustment several times, and the tracking adjustment should be finally done by the trimmer capacitors.

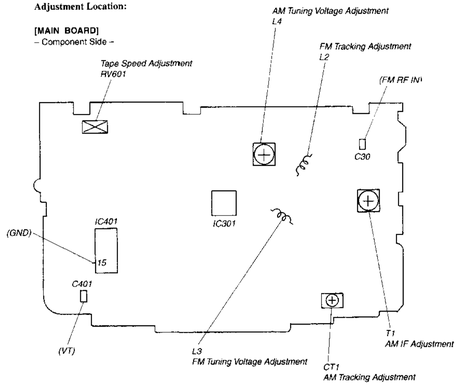
AM IF ADJUSTMENT
Adjust for a maximum reading on level meter
T1
1000 (999) kHz

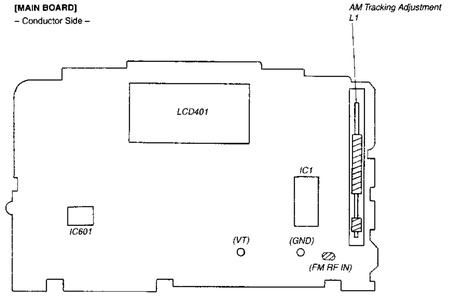
( ): Except US, Canadian model

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter	
L1 (BAR ANTENNA)	CT1
620 (621) kHz	1400 (1395) kHz

( ): Except US, Canadian model

Adjustment Location:





SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION DESCRIPTION

MAIN BOARD IC401 μPD17015GS-545-GJG-E1 (SYSTEM CONTROL, LCD DRIVE)

Pin No.	Pin Name	I/O	Function
1	KEYIN3	I	Key return signal input.
2	KEYOUT1	O	Key source signal output.
3	KEYOUT2	O	
4	KEYOUT3	O	
5	MUTE	O	Mute signal output "L": Mute
6	BEEP/INIT	O	Buzzer output.
7	SD	I	No broadcasting station
8	TAPEON	O	Tape power ON/OFF "H": Tape ON
9	RADIOON	O	Radio power ON/OFF "H": Radio ON
10	BAND	O	BAND select signal output
11	CE	I	Voltage detect.
12	XOUT	O	Connected to the 75kHz crystal oscillator.
13	XIN	I	
14	VDD	–	Power supply 3V
15	GND	–	Ground
16	EO	O	PLL error output.
17	VREG	–	Connected to the regulator circuit capacitor (PLL).
18	VCOFM	I	FM VCO input.
19	VCOAM	I	AM VCO input.
20	LCD8	O	Liquid crystal display segment signal output.
21	LCD7	O	
22	LCD6	O	
23	LCD5	O	
24	LCD4	O	
25	LCD3	O	
26	LCD2	O	
27	LCD1	O	
28	LCD0	O	
29	COM3	O	Liquid crystal display common signal output.
30	COM2	O	
31	COM1	O	
32	COM0	O	
33	VLCD1	–	Power supply for liquid crystal display drive.
34	CAP1	–	Connected to the power voltage capacitor for liquid crystal display drive.
35	CAP0	–	
36	VLCD0	–	Power supply for liquid crystal display drive.
37	KEYIN1	I	Key return signal input.
38	KEYIN2	I	

5-2. PRINTED WIRING BOARD

• Semiconductor Location

Ref. No.	Location
D1	C-6
D2	B-7
D3	C-7
D301	C-2
D302	B-3
D303	B-17
D401	D-3
D402	D-3
IC1	C-13
IC301	C-5
IC401	E-2
IC601	C-18
Q2	D-7
Q101	D-4
Q201	D-4
Q301	C-4
Q302	B-4
Q304	C-4
Q305	C-4
Q306	C-3
Q307	B-17
Q308	B-5
Q309	C-5
Q401	E-2
Q402	F-2
Q403	F-3
Q405	D-8

Note on Printed Wiring Board:

- ⟷ : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ⊡ : indicates side identified with part number.
- △ : internal component.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:

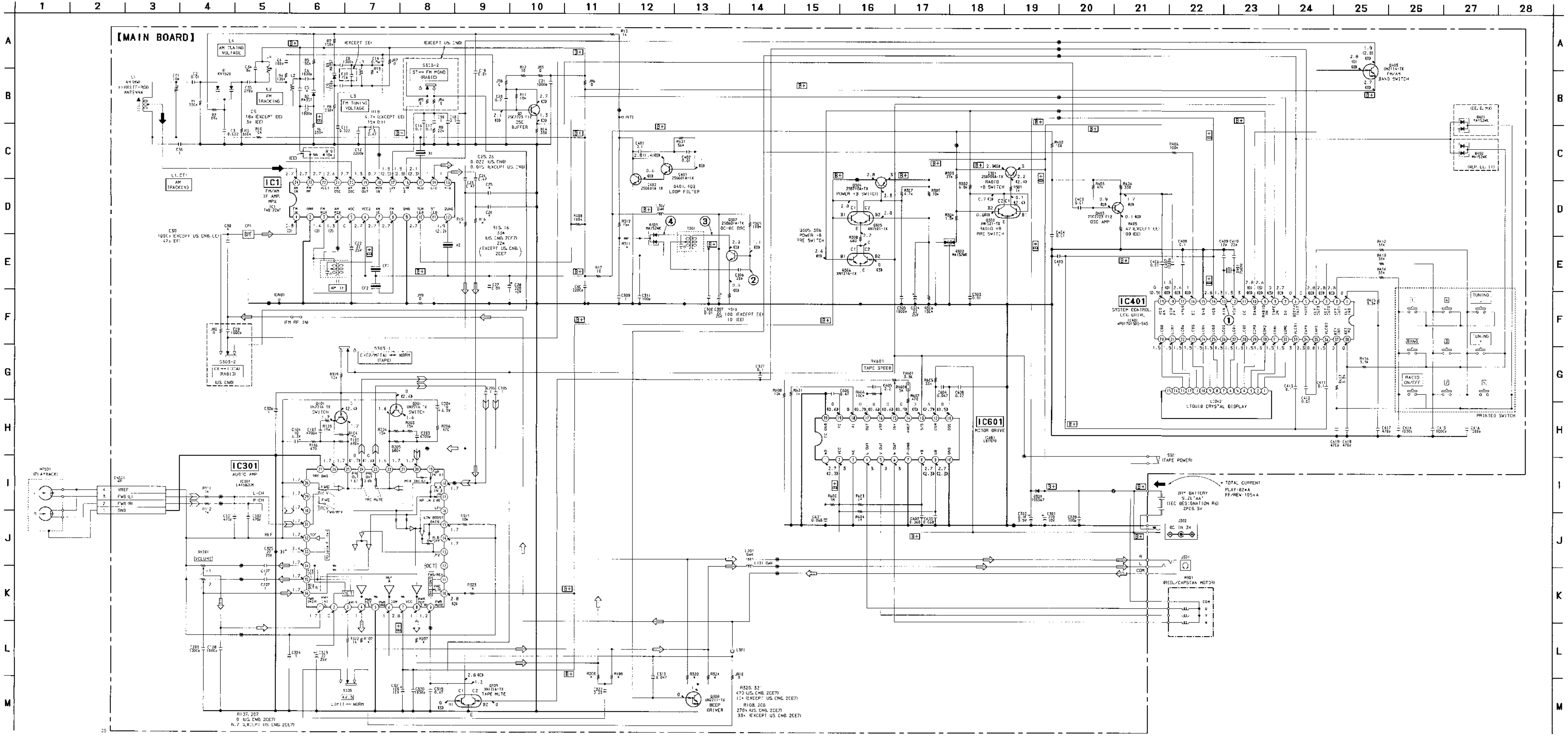
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

• Abbreviation
CND : Canadian
IT : Italian
EE : East European
MX : Mexican

【MAIN BOARD】(COMPONENT SIDE)

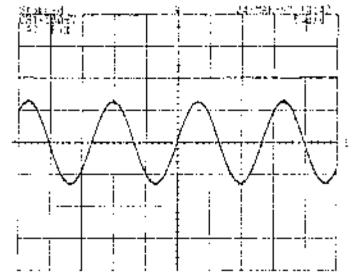
【MAIN BOARD】(CONDUCTOR SIDE)

* : Printed switch

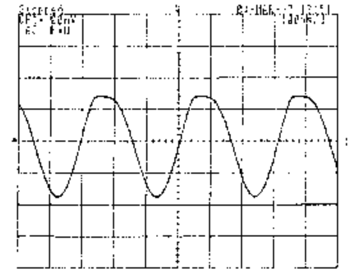


• Waveforms

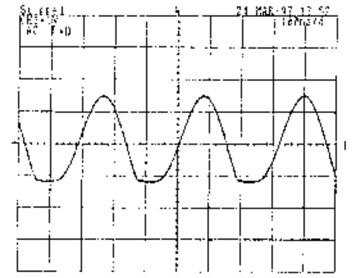
❶ IC401 ⑬ (XIN)



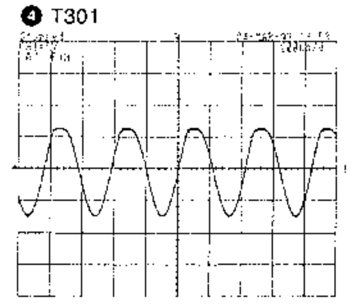
❷ Q307 (BASE)



❸ Q307 (COLLECTOR)



❹ T301



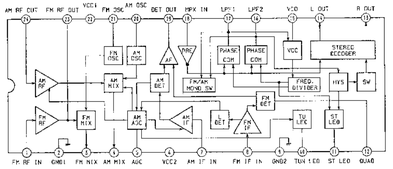
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.
- [B+] : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ( ) : AM
  << >> : PB (TAPE)
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
  ➡ : AM
  ⊳ : PB (TAPE)
- Abbreviation
  CND : Canadian
  IT : Italian
  EE : East European
  MX : Mexican
  2CE7 : Headphone (MDR-023) supplied with this set in AEP model.

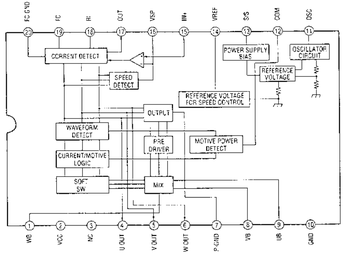
SECTION 6
EXPLODED VIEWS

• IC Block Diagrams

IC1 TA8122AF



IC601 LB1979V-TLM

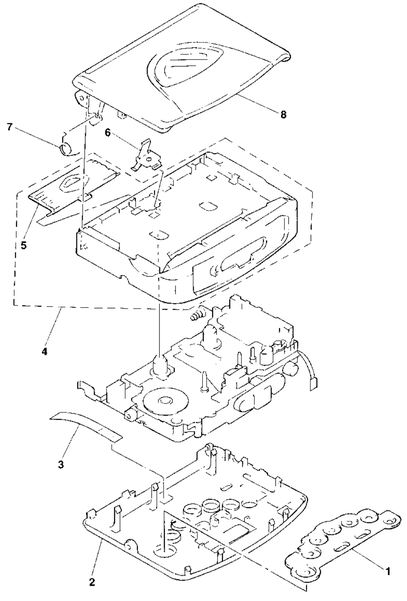


NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

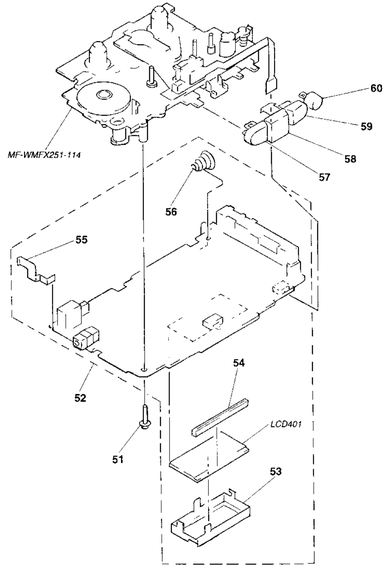
- Abbreviation
  CND : Canadian
  IT : Italian
  EE : East European
  MX : Mexican
  2CH7 : Headphone (MDR-023) supplied with this set in AEP model.

(1) MAIN SECTION-1



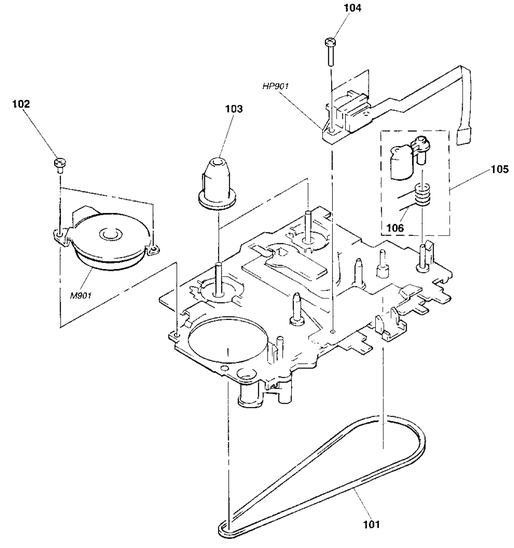
Ref.No.	Part No.	Description	Remark
1	3-007-008-01	BUTTON (PRESET) (-, +)	
2	X-3373-214-1	CABINET (FRONT) SUB ASSY	
3	3-011-760-01	SHEET, BATTERY	
4	X-3372-963-1	CABINET (CT-V17D) SUB ASSY (US,CND)	
4	X-3373-381-1	CABINET (CENTER) SUB ASSY (AEP, IT, EE, E, MX, 2CE7)	
5	3-007-001-01	LID, BATTERY CASE	
6	3-007-011-01	SPRING (CASSETTE)	
7	3-007-012-01	SPRING (TORSION)	
8	X-3373-921-1	HOLDER (SUB) ASSY, CASSETTE (US, CND, E, MX)	
8	X-3373-922-1	HOLDER (SUB) ASSY, CASSETTE (AEP, IT, EE, 2CE7)	

(2) MAIN SECTION-2



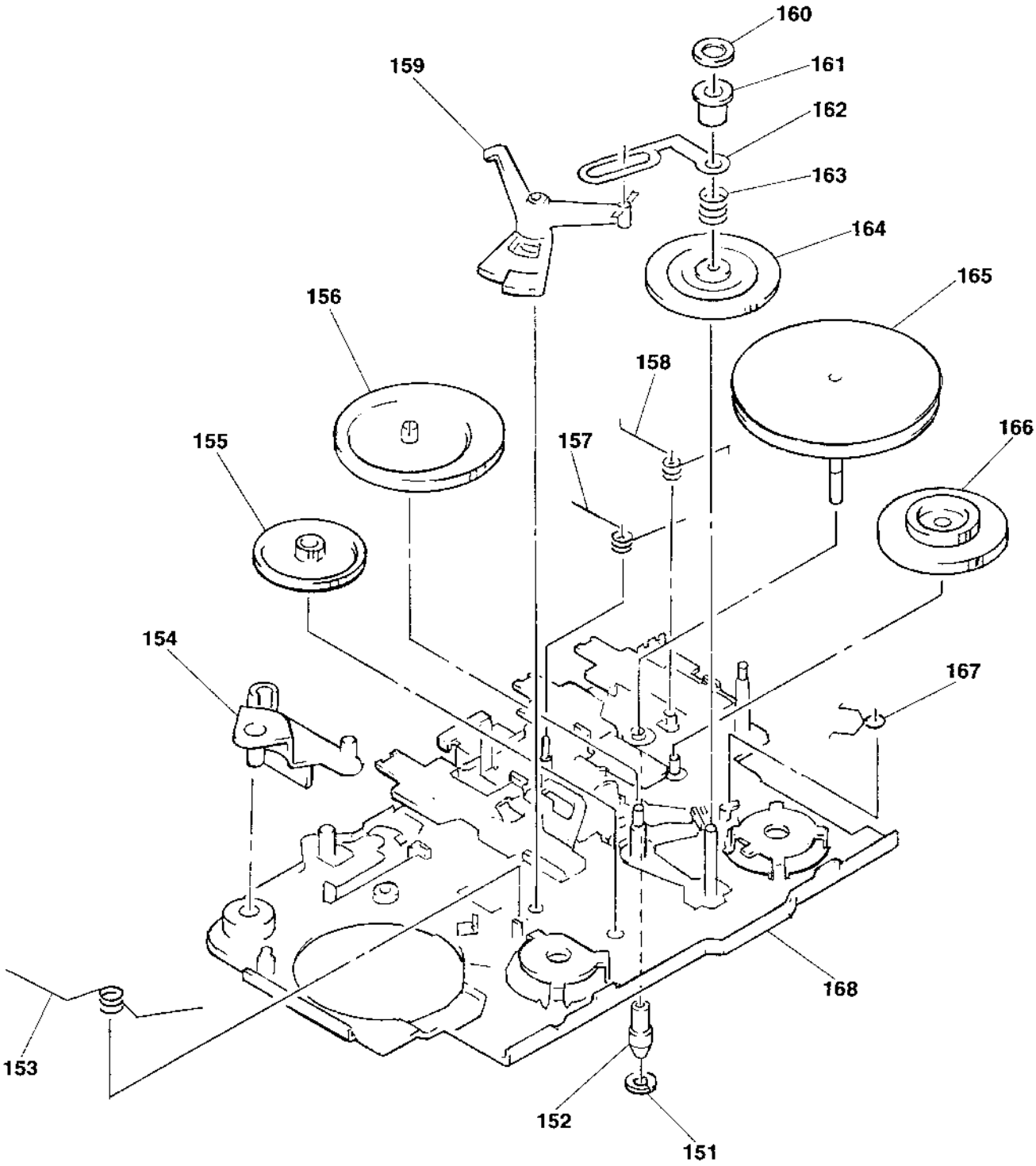
Ref.No.	Part No.	Description	Remark
51	3-088-599-01	SCREW (M 1.4), TOOTH (WH)	
52	A-3016-908-A	MAIN BOARD, COMPLETE (US, CND)	
52	A-3016-907-A	MAIN BOARD, COMPLETE (AEP, IT)	
52	A-3016-902-A	MAIN BOARD, COMPLETE (EE)	
52	A-3016-593-A	MAIN BOARD, COMPLETE (E, MX)	
52	A-3016-595-A	MAIN BOARD, COMPLETE (2CE7)	
* 53	3-007-007-01	HOLDER, LCD	
* 54	1-564-178-11	CONNECTOR, RUBBER	
55	3-007-009-01	TERMINAL (-), BATTERY	
56	3-007-010-01	TERMINAL (+), BATTERY	
57	3-007-005-01	BUTTON (REW) (◀◀)	
58	3-007-003-01	BUTTON (PLAY) (▶)	
59	3-007-004-01	BUTTON (FF) (▶▶)	
60	3-007-006-01	BUTTON (STOP) (■)	
	LCD401	1-801-462-11 DISPLAY PANEL, LIQUID CRYSTAL	

(3) MACHAMISM SECTION-1 (MF-WMFX251-114)



Ref.No.	Part No.	Description	Remark
101	3-938-627-11	BELT	
102	3-703-816-31	SCREW (M1.4X4.6), SPECIAL HEAD	
103	3-921-042-01	GEAR (REEL)	
104	3-703-816-73	SCREW (M1.4X4.5), SPECIAL HEAD	
105	X-3369-749-1	PINCH LEVER (N) ASSY	
106	3-920-596-01	SPRING (PINCH N)	
HP901	1-500-403-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-688-839-11	MOTOR (REEL/CAPSTAN)	

(4) MACHAMISM SECTION-2 (MF-WMFX251-114)



Ref. No.	Part No.	Description	Remark
151	3-921-797-01	WASHER	
152	3-921-003-01	BEARING	
153	3-938 628-01	SPRING (PLAY-CP)	
154	3-007-762-01	STOPPER	
155	3-920-999-01	GEAR (A)	
156	X 3369 752 1	CLUTCH ASSY	
157	3-013-142-01	SPRING (FR-CP)	
158	3-920-992-01	SPRING (STOP)	
159	3-938-613-01	LEVER (OW), DETECTION	

Ref. No.	Part No.	Description	Remark
160	3-728 091 01	WASHER, STOPPER	
161	3-923 530-01	SLEEVE (M)	
162	3 921-335-01	WASHER, LEVER	
163	3-920 990 01	SPRING (UD), COMPRESSION	
164	3-921-050-01	GEAR (B)	
165	X 3369 747 1	WHEEL ASSY, CAPSTAN	
166	3-921-043-01	GEAR (D)	
167	3-933-324-01	SPRING (FR LEVER)	
168	X-3371-589-1	CHASSIS ASSY	

MAIN

SECTION 7
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.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Abbreviation
  CND : Canadian
  IT : Italian
  EE : East European
  MX : Mexican
  2CE7 : Headphone (MDR-023) supplied with this set in AEP model.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA. . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. .
  uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3016-900-A	MAIN BOARD, COMPLETE (US, CND)			
	A-3016-901-A	MAIN BOARD, COMPLETE (AEP, IT)			
	A-3016-902-A	MAIN BOARD, COMPLETE (EE)			
	A-3016-903-A	MAIN BOARD, COMPLETE (E, MX)			
	A-3016-905-A	MAIN BOARD, COMPLETE (2CE7)			
		**********			
*	1-694-178-11	CONNECTOR, RUBBER			
*	3-007-007-01	HOLDER, LCD			
	3-007-009-01	TERMINAL (+), BATTERY			
	3-007-010-01	TERMINAL (−), BATTERY			
		< CAPACITOR >			
C2	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C3	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C4	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C5	1-163-086-00	CERAMIC CHIP	3PF		50V (EE)
C5	1-163-163-00	CERAMIC CHIP	18PF	5%	50V (EXCEPT EE)
C6	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C7	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C8	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C9	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C10	1-163-097-00	CERAMIC CHIP	15PF	5%	50V (EXCEPT EE)
C11	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C12	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C13	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C14	1-163-082-00	CERAMIC CHIP	0.5PF	0.25PF	50V
C16	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C17	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C18	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C19	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C20	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C21	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C22	1-128-551-11	ELECT	22uF	20%	25V
C23	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C24	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C25	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V (US, CND)
C25	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V (EXCEPT US, CND)
C26	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V (US, CND)
C26	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V (EXCEPT US, CND)
C27	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C28	1-126-923-11	ELECT	220uF	20%	10V
C29	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (US, CND)
C30	1-162-949-11	CERAMIC CHIP	47PF	5%	50V (EE)
C30	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (EXCEPT US, CND, EE)
C34	1-163-091-00	CERAMIC CHIP	8PF		50V
C35	1-163-002-11	CERAMIC CHIP	270PF	10%	50V
C36	1-115-156-11	CERAMIC CHIP	1uF		10V
C39	1-115-156-11	CERAMIC CHIP	1uF		10V
C40	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C101	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C102	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C103	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C104	1-126-157-11	ELECT	10uF	20%	16V
C105	1-115-156-11	CERAMIC CHIP	1uF		10V
C107	1-115-156-11	CERAMIC CHIP	1uF		10V
C108	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C203	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C204	1-126-157-11	ELECT	10uF	20%	16V
C205	1-115-156-11	CERAMIC CHIP	1uF		10V
C207	1-115-156-11	CERAMIC CHIP	1uF		10V
C208	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-126-923-11	ELECT	220uF	20%	10V
C302	1-117-579-11	CAPACITOR	0.1F		3.5V
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C304	1-128-551-11	ELECT	22uF	20%	25V
C305	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C306	1-163-100-00	CERAMIC CHIP	20PF	5%	50V
C307	1-128-551-11	ELECT	22uF	20%	25V
C308	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C309	1-115-156-11	CERAMIC CHIP	1uF		10V
C310	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C311	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C319	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V

Ref. No.	Part No.	Description			Remark
C320	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C321	1-126-933-11	ELECT	100uF	20%	10V
C322	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C323	1-128-551-11	ELECT	22uF	20%	25V
C324	1-115-156-11	CERAMIC CHIP	1uF		10V
C325	1-128-551-11	ELECT	22uF	20%	25V
C326	1-115-156-11	CERAMIC CHIP	1uF		10V
C327	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C328	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C401	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C402	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C403	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C404	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C405	1-115-156-11	CERAMIC CHIP	1uF		10V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C407	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C408	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C409	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C410	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C411	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C414	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C415	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C416	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C417	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C418	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C419	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C601	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C602	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C603	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C604	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C605	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C606	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C608	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
		< FILTER >			
CF1	1-760-345-21	FILTER, CERAMIC			
CF2	1-767-336-11	FILTER, CERAMIC (EXCEPT EE)			
CF2	1-767-336-31	FILTER, CERAMIC (EE)			
		< CONNECTOR >			
* CN301	1-778-774-11	HOUSING, CONNECTOR (FPC) 4P			
		< CONPOSITION CIRCUIT BLOCK >			
CP1	1-236-711-21	FILTER, BAND PASS (EXCEPT EE)			
CP1	1-239-813-21	FILTER, BAND PASS (EE)			
		< TRIMMER >			
CT1	1-141-463-11	CAP, ADJ 10PF			
		< DIODE >			
D1	8-719-049-75	DIODE KV1520TL00			
D2	8-719-053-30	DIODE MA2S357-(TX). SO			
D3	8-719-053-30	DIODE MA2S357-(TX). SO			
D301	8-719-049-09	DIODE 1SS367-T3SONY			
D302	8-719-801-78	DIODE 1SS184			
D303	8-719-801-78	DIODE 1SS184			
D401	8-719-801-78	DIODE 1SS184 (EE, E, MX)			
D402	8-719-801-78	DIODE 1SS184 (AEP, EE, IT)			
		< IC >			
IC1	8-759-230-39	IC TA8122AF			
IC301	8-759-285-29	IC LA4582CM			
IC401	8-759-459-71	IC uPD17015GS-545-GJG-E1			
IC601	8-759-447-73	IC LB1979V-TLM			
		< JACK >			
J301	1-565-287-11	JACK (Ω)			
J302	1-750-061-11	JACK, DC (POLARITY UNIFIED TYPE)			(DC IN 3V)
		< JUMPER RESISTOR >			
JR2	1-216-864-11	METAL CHIP	0	5%	1/16W (US, CND)
JR3	1-216-864-11	METAL CHIP	0	5%	1/16W
JR4	1-216-864-11	METAL CHIP	0	5%	1/16W (EXCEPT US, CND)
JR5	1-216-864-11	METAL CHIP	0	5%	1/16W (EXCEPT US, CND)
JR6	1-216-864-11	METAL CHIP	0	5%	1/16W
JR7	1-216-295-00	CONDUCTOR, CHIP		(2012)	
JR8	1-216-864-11	METAL CHIP	0	5%	1/16W
JR9	1-216-296-00	CONDUCTOR, CHIP		(3216)	
JR10	1-216-864-11	METAL CHIP	0	5%	1/16W
		< COIL >			
L1	1-501-865-11	ANTENNA, FERRITE-ROD (MW)			
L2	1-416-036-11	COIL, AIR-CORE (EXCEPT EE)			
L2	1-416-038-11	COIL, AIR-CORE (EE)			
L3	1-416-035-11	COIL, AIR-CORE (EXCEPT EE)			
L3	1-416-037-11	COIL, AIR-CORE (EE)			
L4	1-411-989-11	COIL (WITH CORE) (AM OSC)			
L101	1-414-760-21	INDUCTOR CHIP 0uH			
L201	1-414-760-21	INDUCTOR CHIP 0uH			
L301	1-414-385-11	INDUCTOR, FERRITE BEAD			
L302	1-414-760-21	INDUCTOR CHIP 0uH			
		< LIQUID CRYSTAL DISPLAY >			
LCD401	1-801-462-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q2	8-729-102-27	TRANSISTOR 2SC2223-T1F12			
Q101	8-729-424-67	TRANSISTOR UN2216			
Q201	8-729-424-67	TRANSISTOR UN2216			
Q301	8-729-216-22	TRANSISTOR 2SA1162-G			
Q302	8-729-402-13	TRANSISTOR XN1501			
Q304	8-729-041-05	TRANSISTOR 2SB710A-TX			
Q305	8-729-402-13	TRANSISTOR XN1501			
Q306	8-729-421-23	TRANSISTOR XN1216			
Q307	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q308	8-729-421-22	TRANSISTOR UN2211			
Q309	8-729-421-23	TRANSISTOR XN1216			
Q401	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q402	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q403	8-729-102-27	TRANSISTOR 2SC2223-T1F12			
Q405	8-729-901-46	TRANSISTOR DTA114YK			

MAIN

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R1	1-216-851-11	METAL CHIP	330K	5%	1/16W
R2	1-216-839-11	METAL CHIP	33K	5%	1/16W
R3	1-216-851-11	METAL CHIP	330K	5%	1/16W
R4	1-216-845-11	METAL CHIP	100K	5%	1/16W
R5	1-216-847-11	METAL CHIP	150K	5%	1/16W
R6	1-216-851-11	METAL CHIP	330K	5%	1/16W
R7	1-216-847-11	METAL CHIP	150K	5%	1/16W
R8	1-216-851-11	METAL CHIP	330K	5%	1/16W
R9	1-216-837-11	METAL CHIP	22K	5%	1/16W
R10	1-216-833-11	METAL CHIP	10K	5%	1/16W
R11	1-216-833-11	METAL CHIP	10K	5%	1/16W
R12	1-216-797-11	METAL CHIP	10	5%	1/16W
R13	1-216-821-11	METAL CHIP	1K	5%	1/16W
R14	1-216-815-11	METAL CHIP	330	5%	1/16W
R15	1-216-837-11	METAL CHIP	22K	5%	1/16W (EXCEPT US, CND, 2CE7)
R15	1-216-839-11	METAL CHIP	33K	5%	1/16W (US, CND, 2CE7)
R16	1-216-837-11	METAL CHIP	22K	5%	1/16W (EXCEPT US, CND, 2CE7)
R16	1-216-839-11	METAL CHIP	33K	5%	1/16W (US, CND, 2CE7)
R17	1-216-797-11	METAL CHIP	10	5%	1/16W
R18	1-216-829-11	METAL CHIP	4.7K	5%	1/16W (EXCEPT EE)
R18	1-216-835-11	METAL CHIP	15K	5%	1/16W (EE)
R19	1-216-833-11	METAL CHIP	10K	5%	1/16W (EE)
R103	1-216-835-11	METAL CHIP	15K	5%	1/16W
R104	1-216-835-11	METAL CHIP	15K	5%	1/16W
R105	1-216-855-11	METAL CHIP	680K	5%	1/16W
R106	1-216-817-11	METAL CHIP	470	5%	1/16W
R107	1-216-796-11	METAL GLAZE	8.2	5%	1/16W (EXCEPT US, CND, 2CE7)
R107	1-216-864-11	METAL CHIP	0	5%	1/16W (US, CND, 2CE7)
R108	1-216-839-11	METAL CHIP	33K	5%	1/16W (EXCEPT US, CND, 2CE7)
R108	1-216-850-11	METAL CHIP	270K	5%	1/16W (US, CND, 2CE7)
R111	1-216-821-11	METAL CHIP	1K	5%	1/16W
R112	1-216-821-11	METAL CHIP	1K	5%	1/16W
R203	1-216-835-11	METAL CHIP	15K	5%	1/16W
R204	1-216-835-11	METAL CHIP	15K	5%	1/16W
R205	1-216-855-11	METAL CHIP	680K	5%	1/16W
R206	1-216-817-11	METAL CHIP	470	5%	1/16W
R207	1-216-796-11	METAL GLAZE	8.2	5%	1/16W (EXCEPT US, CND, 2CE7)
R207	1-216-864-11	METAL CHIP	0	5%	1/16W (US, CND, 2CE7)
R208	1-216-839-11	METAL CHIP	33K	5%	1/16W (EXCEPT US, CND, 2CE7)
R208	1-216-850-11	METAL CHIP	270K	5%	1/16W (US, CND, 2CE7)
R301	1-216-821-11	METAL CHIP	1K	5%	1/16W
R302	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R303	1-216-838-11	METAL CHIP	27K	5%	1/16W
R304	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R305	1-216-833-11	METAL CHIP	10K	5%	1/16W
R306	1-216-847-11	METAL CHIP	150K	5%	1/16W
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R308	1-216-819-11	METAL CHIP	680	5%	1/16W
R309	1-216-845-11	METAL CHIP	100K	5%	1/16W
R310	1-216-797-11	METAL CHIP	10	5%	1/16W (EE)
R310	1-216-809-11	METAL CHIP	100	5%	1/16W (EXCEPT EE)
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-835-11	METAL CHIP	15K	5%	1/16W
R315	1-216-833-11	METAL CHIP	10K	5%	1/16W
R319	1-216-833-11	METAL CHIP	10K	5%	1/16W
R320	1-216-817-11	METAL CHIP	470	5%	1/16W (US, CND, 2CE7)
R320	1-216-833-11	METAL CHIP	10K	5%	1/16W (EXCEPT US, CND, 2CE7)
R321	1-216-190-00	METAL GLAZE	470	5%	1/8W (US, CND, 2CE7)
R321	1-216-222-00	METAL GLAZE	10K	5%	1/8W (EXCEPT US, CND, 2CE7)
R322	1-216-821-11	METAL CHIP	1K	5%	1/16W
R323	1-216-821-11	METAL CHIP	1K	5%	1/16W
R401	1-216-842-11	METAL CHIP	56K	5%	1/16W
R402	1-216-809-11	METAL CHIP	100	5%	1/16W
R403	1-216-841-11	METAL CHIP	47K	5%	1/16W
R404	1-216-815-11	METAL CHIP	330	5%	1/16W
R405	1-216-805-11	METAL CHIP	47	5%	1/16W (EXCEPT EE)
R405	1-216-809-11	METAL CHIP	100	5%	1/16W (EE)
R406	1-216-845-11	METAL CHIP	100K	5%	1/16W
R408	1-216-845-11	METAL CHIP	100K	5%	1/16W
R412	1-216-839-11	METAL CHIP	33K	5%	1/16W
R413	1-216-839-11	METAL CHIP	33K	5%	1/16W
R414	1-216-839-11	METAL CHIP	33K	5%	1/16W
R415	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R416	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R417	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R601	1-216-821-11	METAL CHIP	1K	5%	1/16W
R602	1-216-857-11	METAL CHIP	1M	5%	1/16W
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W
R604	1-216-857-11	METAL CHIP	1M	5%	1/16W
R605	1-216-839-11	METAL CHIP	33K	5%	1/16W
R606	1-216-845-11	METAL CHIP	100K	5%	1/16W
R607	1-216-817-11	METAL CHIP	470	5%	1/16W
R608	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< VARIABLE RESISTOR >			
RV301	1-225-362-11	RES. VAR, CARBON (VOLUME)			
RV601	1-230-720-11	RES, ADJ, CARBON 5K			
		< SWITCH >			
S301	1-762-742-22	SWITCH, DETECTION (SMALL TYPE)			(TAPE POWER)
S303	1-692-298-11	SWITCH, SLIDE (NORM • CrO2/METAL, DX • LOCAL) (US, CND)			
S303	1-692-298-11	SWITCH, SLIDE (NORM • CrO2/METAL, ST • FM MONO) (EXCEPT US, CND)			
S305	1-692-298-11	SWITCH, SLIDE (AVLS)			

Ref. No.	Part No.	Description	Remark
		< TRANSFORMER >	
T1	1-406-694-11	COIL, AM IFT	
T301	1-426-851-11	TRANSFORMER, DC-DC CONVERTER	(EXCEPT EE)
T301	1-426-917-11	TRANSFORMER, DC-DC CONVERTER (EE)	
		< THERMISTOR >	
TH601	1-810-794-11	THERMISTOR, POSITIVE	
		< VIBRATOR >	
X1	1-577-091-21	OSCILLATOR, CRYSTAL	
X2	1-767-336-11	FILTER, CERAMIC (EXCEPT EE)	
X2	1-767-336-31	FILTER, CERAMIC (EE)	
X401	1-577-262-11	VIBRATOR, CRYSTAL (75kHz)	
**********			
		MISCELLANEOUS	
		**********	
HP901	1-500-403-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-698-839-11	MOTOR (REEL/CAPSTAN)	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-505-521-11	HEADPHONE (MDR-023) (US, CND, 2CE7)	
	3-011-421-01	CASE, CARRYING	
	3-858-914-11	MANUAL, INSTRUCTION (ENGLISH)(US, CND)	
	3-858-914-21	MANUAL, INSTRUCTION (FRENCH) (CND)	
	3-858-914-31	MANUAL, INSTRUCTION (SPANISH) (MX)	
	3-858-914-41	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, ITALIAN) (AEP, IT, EE, 2CE7)	
	3-858-914-51	MANUAL, INSTRUCTION (SPANISH, DUTCH, SWEDISH, PORTUGUESE) (AEP, 2CE7)	
	3-858-914-61	MANUAL, INSTRUCTION (POLISH, CZECK, GREEK, TURKISH) (AEP)	
	3-858-914-71	MANUAL, INSTRUCTION (RUSSIAN, HUNGARIAN, BULGARIAN) (EE)	
	3-858-914-81	MANUAL, INSTRUCTION (ENGLISH, SPANISH, CHINESE, KOREAN) (E)	
	8-953-130-90	HEADPHONE MDR-E801//K SET	(AEP, IT, EE, E, MX)

9-923-168-11

Sony Corporation
Personal A&V Products Company

97C0585-1
Printed in Japan
Published by Quality Engineering Dept.
(Shibaura)

WM-FX251

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model

CORRECTION-1

Correct your service manual as shown below.

☛ **: indicates corrected portion.**

Page	INCORRECT				CORRECT			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
22	101	3-938-627-11	BELT		101	3-013-560-11 ☛	BELT	
23	167	3-933-324-01	SPRING (FR LEVER)		167	3-014-709-01 ☛	SPRING (FR LEVER OW)	
	168	X-3371-589-1	CHASSIS ASSY		168	X-3372-959-1 ☛	CHASSIS COMP ASSY (GL-O)	

(RPC-97011)

9-923-168-91

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Personal A&V Products Company

97L0590-1
Printed in Japan
Published by Quality Engineering Dept.
(Shibaura)

WM-FX251

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model

Ver 1.0 1998. 07

SUPPLEMENT-1

File this supplement with the service manual.

Subject: Change of motor (M901)

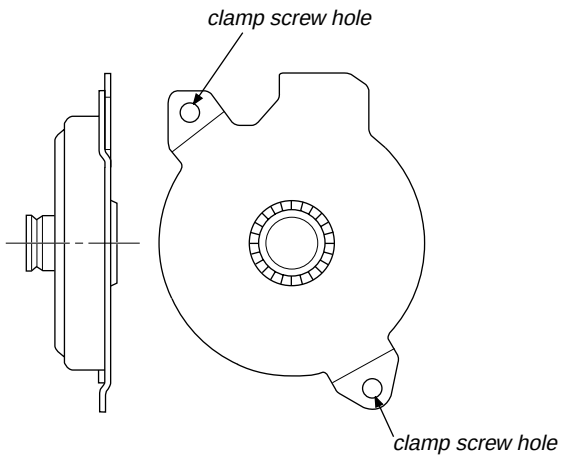
(ENG-98005)

Mounting shape to the mechanism deck and to the exterior cabinet is not compatible. Therefore, if the service of the set concerned requires the motor to be replaced, make sure the shape of motor following the identification method shown below, then replace it with the same type motor.

- **NEW / FORMER DISCRIMINATION**

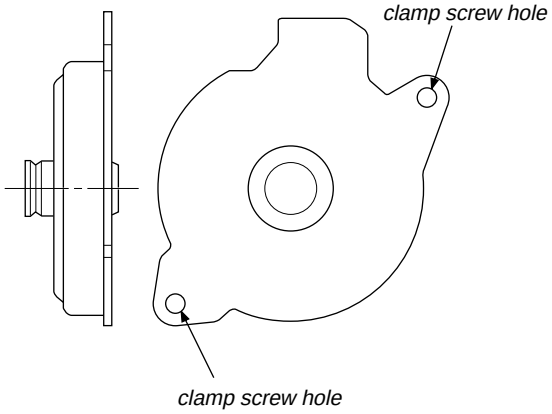
The direction of clamp screw holes is different. (Service manual see page 22, 27)

FORMER



Ref. No.	Part No.	Description	Remark
M901	1-698-839-11	MOTOR (CAPSTAN/REEL)	

NEW



Ref. No.	Part No.	Description	Remark
M901	1-763-073-11	MOTOR (CAPSTAN/REEL)	

9-923-168-81

Sony Corporation
Personal A&V Products Company

98G0583-1
Printed in Japan

Published by Quality Engineering Dept. (Shibaura)

WM-FX251

SONY

SERVICE MANUAL

Ver 1.0 1998. 11

US Model
Canadian Model
AEP Model
E Model

SUPPLEMENT-2

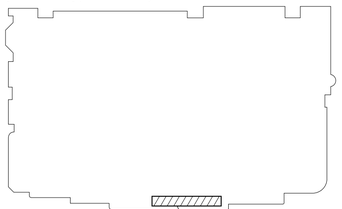
File this supplement with the service manual.

Subject: Change of Main Board (Except East European Model)

(ENG-98009)

- **New/Former Type Discrimination**

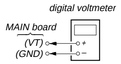
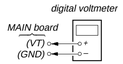
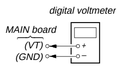
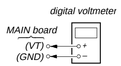
[MAIN BOARD] (Conductor Side)



Former Type : 1-663-023-13
New Type : 1-667-170-14

1. ELECTRICAL ADJUSTMENTS

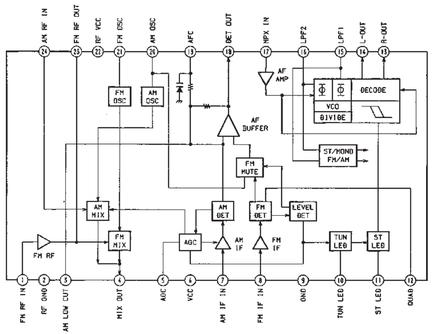
: **Indicates changed portion.**

Page	Former Type	New Type
8	**FM Tuning Voltage Adjustment**  **FM TUNING VOLTAGE ADJUSTMENT** Adjust for a 9.0 $^{+0.5}_{0}$ (14.5 ± 0.5)Vdc reading on digital voltmeter L3 108 MHz ( ): East European model	**FM Tuning Voltage Adjustment**  **FM TUNING VOLTAGE ADJUSTMENT** Adjust for a 9.0 – 9.2 Vdc reading on digital voltmeter L3 108 MHz
	AM Tuning Voltage Adjustment  **AM TUNING VOLTAGE ADJUSTMENT** Adjust for a 1.4 ± 0.1 Vdc reading on digital voltmeter L4 530 (531) kHz ( ): Except US, Canadian model	**AM Tuning Voltage Adjustment**  **AM TUNING VOLTAGE ADJUSTMENT** Adjust for a 1.0 – 1.1 Vdc reading on digital voltmeter L4 530 (531) kHz ( ): Except US, Canadian model

2. DIAGRAMS

- **IC Block Diagram**

IC1 TA2111F- (EL)



2-1. PRINTED WIRING BOARD

• **Semiconductor Location**

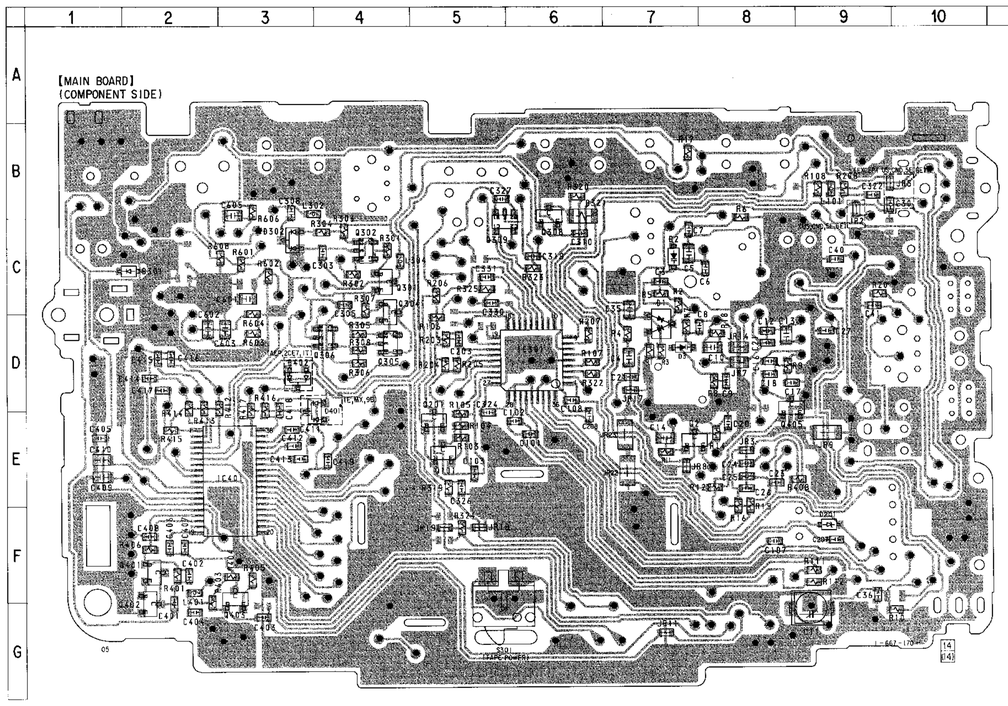
Ref. No.	Location	Ref. No.	Location
D1	D-7	D101	E-5
D2	C-7	D201	E-5
D3	D-7	D301	C-4
D201	F-9	D302	C-4
D301	C-2	D304	C-4
D302	C-3	D305	D-4
D303	C-18	D306	D-4
D401	D-3	D307	B-19
D402	D-3	D308	B-6
		D309	C-5
IC1	D-14	D401	F-2
IC301	D-6	D402	G-2
IC401	E-3	D403	F-3
IC601	C-20	D405	D-8
Q2	E-7		

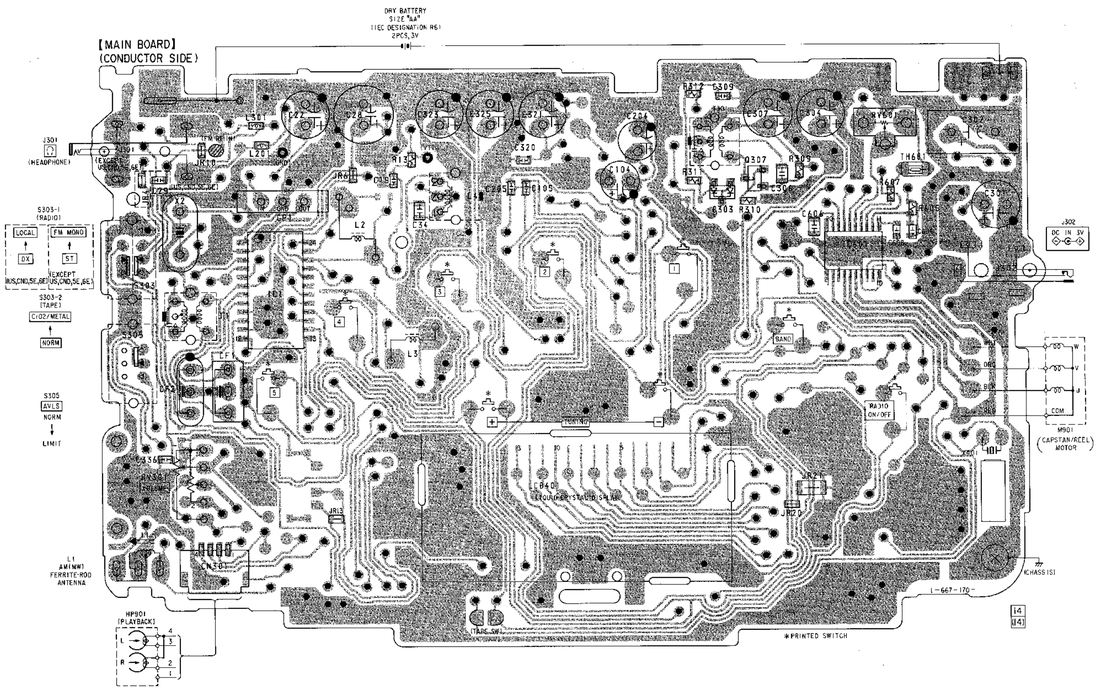
Note on Printed Wiring Board:
- ——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ⊡ : indicates side identified with part number.
- ● : Through hole.
- △ : internal component.
- : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) Parts on the parts face side seen from the parts face are indicated.

• Abbreviation
CND : Canadian
IT : Italian
MX : Mexican
2CE7 : Headphone (MDR-023) supplied with this set in AEP model.
E : Radio Section (ST/MONO)
5E, 6E: Radio Section (DX/LOCAL)
9E : The display of country of origin is not shown.





2-2. SCHEMATIC DIAGRAM • See page 3 for IC Block Diagram.

【MAIN BOARD】

IC1 FM/AM RF AMP, MIX AMP, IF AMP, DET, MPX

IC301 TAPE EQ AMP, BASS BOOST AMP, HEADPHONE AMP

IC401 SYSTEM CONTROLLER, LCD DRIVER

IC601 CAPSTAN/REEL MOTOR DRIVE

0301, 302 B+ SWITCH & REGULATOR

0304-306 B+ SWITCH

TUNING

BAND

RADIO ON/OFF

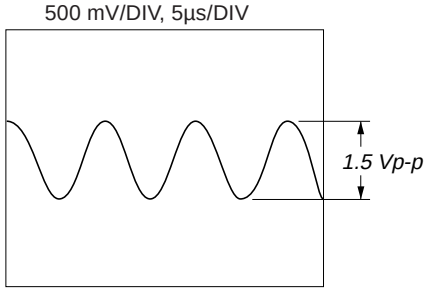
PRINTED SWITCH

TAPE SPEED

·TOTAL CURRENT
PLAY:93mA
FF/REV:92mA
HM:55mA
AM:45mA

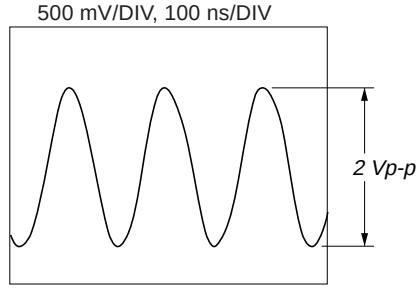
• Waveforms

❶ IC401 ⑬ (XIN)
500 mV/DIV, 5µs/DIV



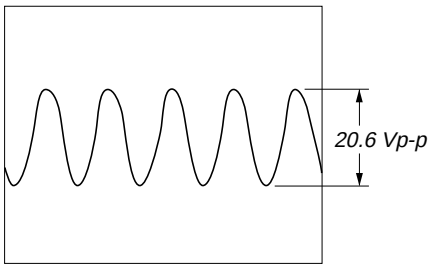
75.2 kHz

❸ Q307 (COLLECTOR)
500 mV/DIV, 100 ns/DIV



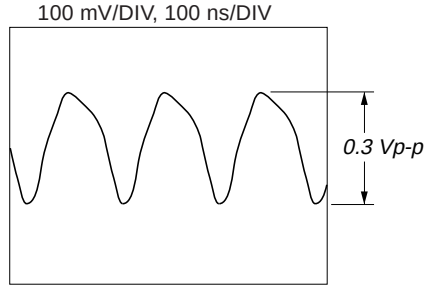
3.38 MHz

❷ T301 (SECONDARY)
5 V/DIV, 200 ns/DIV



2.53 MHz

❹ Q307 (BASE)
100 mV/DIV, 100 ns/DIV



3.38 MHz

Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.
- B + : B+ Line.
- ▬ : adjustment for repair.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ( ) : AM
  〈〈 〉〉 : TAPE PLAYBACK
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
  ➡ : AM
  Σ : TAPE PLAYBACK
- Abbreviation
  CND : Canadian
  IT : Italian
  MX : Mexican
  2CE7 : Headphone (MDR-023) supplied with this set in AEP model.
  E : Radio Section (ST/MONO)
  5E, 6E: Radio Section (DX/LOCAL)
  9E : The display of country of origin is not shown.

3. 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.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Abbreviation
  CND : Canadian
  IT : Italian
  MX : Mexican
  2CE7 : Headphone (MDR-023) supplied with this set in AEP model.
  E : Radio Section (ST/MONO)
  5E, 6E: Radio Section (DX/LOCAL)
  9E : The display of country of origin is not shown.

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. . uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3021-148-A	MAIN BOARD, COMPLETE (5E, 6E)			
	A-3021-149-A	MAIN BOARD, COMPLETE (US, CND)			
	A-3021-150-A	MAIN BOARD, COMPLETE (2CE7)			
	A-3021-152-A	MAIN BOARD, COMPLETE (AEP, IT)			
	A-3021-153-A	MAIN BOARD, COMPLETE (E, MX, 9E)			
		**********			
*	1-694-178-11	CONNECTOR, RUBBER			
*	3-007-007-01	HOLDER, LCD			
	3-007-009-01	TERMINAL (+), BATTERY			
	3-007-010-01	TERMINAL (-), BATTERY			
		< CAPACITOR >			
C2	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C3	1-162-995-11	CERAMIC CHIP	0.022uF	50V	
C4	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C5	1-163-093-00	CERAMIC CHIP	10PF	5% 50V	
C6	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C7	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C8	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C9	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C10	1-163-097-00	CERAMIC CHIP	15PF	5% 50V	
C12	1-162-966-11	CERAMIC CHIP	0.0022uF	10% 50V	
C13	1-164-005-11	CERAMIC CHIP	0.47uF	25V	
C14	1-163-220-11	CERAMIC CHIP	3PF	0.25PF 50V	
C16	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C17	1-115-156-11	CERAMIC CHIP	1uF	10V	
C18	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C19	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C20	1-162-974-11	CERAMIC CHIP	0.01uF	50V	
C21	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C22	1-126-963-11	ELECT	4.7uF	20% 50V	
C23	1-113-619-11	CERAMIC CHIP	0.47uF	10V	
C24	1-113-619-11	CERAMIC CHIP	0.47uF	10V	
C25	1-164-227-11	CERAMIC CHIP	0.022uF	10% 25V (US, CND, 5E, 6E)	
C25	1-164-245-11	CERAMIC CHIP	0.015uF	10% 25V (AEP, E, MX, 2CE7, 9E, IT)	
C26	1-164-227-11	CERAMIC CHIP	0.022uF	10% 25V (US, CND, 5E, 6E)	
C26	1-164-245-11	CERAMIC CHIP	0.015uF	10% 25V (AEP, E, MX, 2CE7, 9E, IT)	
C27	1-162-974-11	CERAMIC CHIP	0.01uF	50V	
C28	1-126-924-11	ELECT	330uF	20% 6.3V	
C29	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V (US, CND, 5E, 6E)	
C30	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V (AEP, E, MX, 2CE7, 9E, IT)	
C34	1-163-098-00	CERAMIC CHIP	16PF	5% 50V (AEP, E, MX, 2CE7, 9E, IT)	
C34	1-163-163-00	CERAMIC CHIP	18PF	5% 50V (US, CND, 5E, 6E)	
C35	1-163-003-11	CERAMIC CHIP	330PF	10% 50V	
C36	1-115-156-11	CERAMIC CHIP	1uF	10V	
C40	1-162-966-11	CERAMIC CHIP	0.0022uF	10% 50V	
C41	1-113-619-11	CERAMIC CHIP	0.47uF	10V	
C101	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C102	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C103	1-162-968-11	CERAMIC CHIP	0.0047uF	10% 50V	
C104	1-126-157-11	ELECT	10uF	20% 16V	
C105	1-115-156-11	CERAMIC CHIP	1uF	10V	
C107	1-115-156-11	CERAMIC CHIP	1uF	10V	
C108	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C203	1-162-968-11	CERAMIC CHIP	0.0047uF	10% 50V	
C204	1-126-157-11	ELECT	10uF	20% 16V	
C205	1-115-156-11	CERAMIC CHIP	1uF	10V	
C207	1-115-156-11	CERAMIC CHIP	1uF	10V	
C208	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C301	1-126-934-11	ELECT	220uF	20% 10V	
C302	1-117-579-11	DOUBLE LAYER	0.1F	3.5V	
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C304	1-128-551-11	ELECT	22uF	20% 25V	
C305	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C306	1-163-100-00	CERAMIC CHIP	20PF	5% 50V	
C307	1-128-551-11	ELECT	22uF	20% 25V	
C308	1-162-974-11	CERAMIC CHIP	0.01uF	50V	
C309	1-115-156-11	CERAMIC CHIP	1uF	10V	
C310	1-164-361-11	CERAMIC CHIP	0.047uF	16V	
C319	1-113-619-11	CERAMIC CHIP	0.47uF	10V	
C320	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C321	1-104-665-11	ELECT	100uF	20% 10V	
C322	1-165-128-11	CERAMIC CHIP	0.22uF	16V	
C323	1-128-551-11	ELECT	22uF	20% 25V	
C324	1-115-156-11	CERAMIC CHIP	1uF	10V	
C325	1-128-551-11	ELECT	22uF	20% 25V	
C326	1-115-156-11	CERAMIC CHIP	1uF	10V	
C327	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C330	1-165-176-11	CERAMIC CHIP	0.047uF	10% 16V	
C331	1-115-467-11	CERAMIC CHIP	0.22uF	10% 10V	
C336	1-162-974-11	CERAMIC CHIP	0.01uF	50V	
C401	1-107-826-11	CERAMIC CHIP	0.1uF	10% 16V	
C402	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C403	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C404	1-162-974-11	CERAMIC CHIP	0.01uF	50V	
C405	1-115-156-11	CERAMIC CHIP	1uF	10V	
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C407	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C408	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C409	1-163-095-00	CERAMIC CHIP	12PF	5% 50V	
C410	1-163-101-00	CERAMIC CHIP	22PF	5% 50V	
C411	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C413	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C414	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C415	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C416	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C417	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C418	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C419	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C601	1-164-344-11	CERAMIC CHIP	0.068uF	10% 25V	
C602	1-164-344-11	CERAMIC CHIP	0.068uF	10% 25V	
C603	1-164-344-11	CERAMIC CHIP	0.068uF	10% 25V	
C604	1-165-176-11	CERAMIC CHIP	0.047uF	10% 16V	
C605	1-164-505-11	CERAMIC CHIP	2.2uF	16V	
C606	1-107-823-11	CERAMIC CHIP	0.47uF	10% 16V	
C608	1-115-467-11	CERAMIC CHIP	0.22uF	10% 10V	
		< FILTER >			
CF1	1-760-345-21	FILTER, CERAMIC			
CF2	1-767-733-11	FILTER ASSY, CERAMIC			
		< CONNECTOR >			
* CN301	1-778-774-11	HOUSING, CONNECTOR (FPC) 4P			
		< CONPOSITION CIRCUIT BLOCK >			
CP1	1-236-711-21	FILTER, BAND PASS			
		< TRIMMER >			
CT1	1-141-422-11	CAP, ADJ 10PF			
		< DIODE >			
D1	8-719-049-75	DIODE	KV1520TL00		
D2	8-719-053-30	DIODE	MA2S357- (TX).SO		
D3	8-719-053-30	DIODE	MA2S357- (TX).SO		
D201	8-719-056-89	DIODE	MAB120-TX		
D301	8-719-049-09	DIODE	1SS367-T3SONY		
D302	8-719-801-78	DIODE	1SS184		
D303	8-719-801-78	DIODE	1SS184		
D401	8-719-801-78	DIODE	1SS184 (E, MX, 9E)		
D402	8-719-801-78	DIODE	1SS184 (AEP, 2CE7, IT)		
		< IC >			
IC1	8-759-493-20	IC	TA2111F- (EL)		
IC301	8-759-285-29	IC	LA4582CM		
IC401	8-759-459-71	IC	uPD17015GS-545-GJG-E1		
IC601	8-759-447-73	IC	LB1979V-TLM		
		< JACK >			
J301	1-565-287-11	JACK (🎧)			
J302	1-750-061-11	JACK, DC (POLARITY UNIFIED TYPE) (DC IN 3V)			
		< JUMPER RESISTOR >			
JR2	1-216-864-11	METAL CHIP	0	5% 1/16W (US, CND, 5E, 6E)	
JR3	1-216-864-11	METAL CHIP	0	5% 1/16W (AEP, E, MX, 2CE7, 9E, IT)	
JR4	1-216-864-11	METAL CHIP	0	5% 1/16W (AEP, E, MX, 2CE7, 9E, IT)	
JR5	1-216-864-11	METAL CHIP	0	5% 1/16W (AEP, E, MX, 2CE7, 9E, IT)	
JR6	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR7	1-216-295-91	SHORT	0		
JR8	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR9	1-216-296-91	SHORT	0		
JR10	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR11	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR13	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR14	1-216-295-91	SHORT	0		
JR17	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR18	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR19	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR20	1-216-864-11	METAL CHIP	0	5% 1/16W	
JR21	1-216-296-91	SHORT	0		
JR22	1-216-296-91	SHORT	0		
JR23	1-216-296-91	SHORT	0		
		< COIL >			
L1	1-501-865-11	ANTENNA, FERRITE-ROD (MW)			
L2	1-416-528-11	COIL, AIR-CORE			
L3	1-416-449-11	COIL, AIR-CORE			
L4	1-416-423-11	COIL (WITH CORE) (AM OSC)			
L101	1-414-760-21	FERRITE	0uH		
L201	1-414-760-21	FERRITE	0uH		
L301	1-414-760-21	INDUCTOR CHIP	0uH		
L302	1-414-760-21	FERRITE	0uH		
L304	1-414-760-21	FERRITE	0uH		
L401	1-414-760-21	FERRITE	0uH		
		< LIQUID CRYSTAL DISPLAY >			
LCD401	1-801-462-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q2	8-729-102-27	TRANSISTOR	2SC2223-T1F12		
Q101	8-729-424-67	TRANSISTOR	UN2216		
Q201	8-729-424-67	TRANSISTOR	UN2216		
Q301	8-729-216-22	TRANSISTOR	2SA1162-G		
Q302	8-729-402-13	TRANSISTOR	XN1501		
Q304	8-729-041-05	TRANSISTOR	2SB710A-TX		
Q305	8-729-402-13	TRANSISTOR	XN1501		
Q306	8-729-421-23	TRANSISTOR	XN1216		
Q307	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q308	8-729-421-22	TRANSISTOR	UN2211		
Q309	8-729-421-23	TRANSISTOR	XN1216		
Q401	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q402	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q403	8-729-102-27	TRANSISTOR	2SC2223-T1F12		
Q405	8-729-901-46	TRANSISTOR	DTA114YK		
		< RESISTOR >			
R1	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R2	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R3	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R4	1-216-837-11	METAL CHIP	22K	5% 1/16W	
R5	1-216-847-11	METAL CHIP	150K	5% 1/16W	
R6	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R7	1-216-847-11	METAL CHIP	150K	5% 1/16W	
R8	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R9	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R10	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R11	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R12	1-216-797-11	METAL CHIP	10	5% 1/16W	
R13	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R14	1-216-815-11	METAL CHIP	330	5% 1/16W	
R15	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R16	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R17	1-216-797-11	METAL CHIP	10	5% 1/16W	
R18	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R20	1-216-815-11	METAL CHIP	330	5% 1/16W	
R103	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R104	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R105	1-216-855-11	METAL CHIP	680K	5% 1/16W	
R106	1-216-817-11	METAL CHIP	470	5% 1/16W	
R107	1-216-796-11	RES, CHIP	8.2	5% 1/16W (AEP, E, MX, 5E, 6E, 9E, IT)	
R107	1-216-864-11	METAL CHIP	0	5% 1/16W (US, CND, 2CE7)	
R108	1-216-839-11	METAL CHIP	33K	5% 1/16W (AEP, E, MX, 5E, 6E, 9E, IT)	
R108	1-216-850-11	METAL CHIP	270K	5% 1/16W (US, CND, 2CE7)	
R111	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R112	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R203	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R204	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R205	1-216-855-11	METAL CHIP	680K	5% 1/16W	
R206	1-216-817-11	METAL CHIP	470	5% 1/16W	
R207	1-216-796-11	RES, CHIP	8.2	5% 1/16W (AEP, E, MX, 5E, 6E, 9E, IT)	
R207	1-216-864-11	METAL CHIP	0	5% 1/16W (US, CND, 2CE7)	
R208	1-216-839-11	METAL CHIP	33K	5% 1/16W (AEP, E, MX, 5E, 6E, 9E, IT)	
R208	1-216-850-11	METAL CHIP	270K	5% 1/16W (US, CND, 2CE7)	
R301	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R302	1-216-831-11	METAL CHIP	6.8K	5% 1/16W	
R303	1-216-838-11	METAL CHIP	27K	5% 1/16W < THERMISTOR >	
TH601	1-810-794-11	THERMISTOR, POSITIVE			
		< VIBRATOR >			
X2	1-767-733-11	FILTER ASSY, CERAMIC			
X401	1-577-262-11	VIBRATOR, CRYSTAL (75kHz)			
R304	1-216-823-11	METAL CHIP	1.5K	5% 1/16W	
R305	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R306	1-216-847-11	METAL CHIP	150K	5% 1/16W	
R307	1-216-829-11	METAL CHIP	4.7K	5% 1/16W	
R308	1-216-819-11	METAL CHIP	680	5% 1/16W	
R309	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R310	1-216-864-11	METAL CHIP	0	5% 1/16W	
R311	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R312	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R319	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R320	1-216-817-11	METAL CHIP	470	5% 1/16W (US, CND, 2CE7)	
R320	1-216-833-11	METAL CHIP	10K	5% 1/16W (AEP, E, MX, 5E, 6E, 9E, IT)	
R321	1-216-190-00	RES, CHIP	470	5% 1/8W (US, CND, 2CE7)	
R321	1-216-222-00	RES, CHIP	10K	5% 1/8W (AEP, E, MX, 5E, 6E, 9E, IT)	
R322	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R323	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R324	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R325	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R401	1-216-842-11	METAL CHIP	56K	5% 1/16W	
R403	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R404	1-216-815-11	METAL CHIP	330	5% 1/16W	
R405	1-216-805-11	METAL CHIP	47	5% 1/16W	
R406	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R408	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R412	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R413	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R414	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R415	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R416	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R417	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R601	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R602	1-216-857-11	METAL CHIP	1M	5% 1/16W	
R603	1-216-857-11	METAL CHIP	1M	5% 1/16W	
R604	1-216-857-11	METAL CHIP	1M	5% 1/16W	
R605	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R606	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R607	1-216-817-11	METAL CHIP	470	5% 1/16W	
R608	1-216-833-11	METAL CHIP	10K	5% 1/16W	
RV301	1-225-362-11	RES, VAR, CARBON (VOLUME)			
RV601	1-241-784-11	RES, ADJ, CARBON 5K			
S301	1-762-742-31	SWITCH, DETECTION (SMALL TYPE) (TAPE POWER)			
S303	1-692-298-11	SWITCH, SLIDE (NORM, CrO2/METAL)			
S305	1-692-298-11	SWITCH, SLIDE (AVLS)			
T1	1-406-694-11	COIL, AM IFT			
T301	1-426-917-11	TRANSFORMER, DC-DC CONVERTER			

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