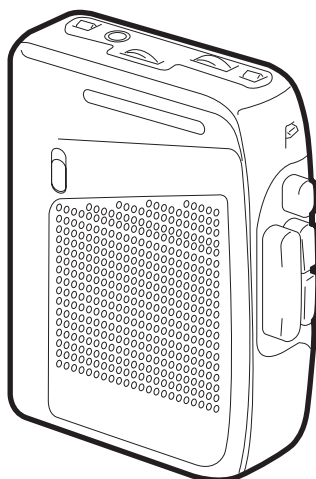


# WM-PA1

## SERVICE MANUAL

*E Model*



Model Name Using Similar Mechanism	WM-FX123
Tape Transport Mechanism Type	MF-WMFX103-48CY

### SPECIFICATIONS

#### Radio Section

FM :87.6 – 108MHz

AM :530 – 1,710kHz

#### Power Requirements

3V DC Batteries AA (R6) x 2

External DC 3V power sources

#### Battery Life

(approximate hours when using the batteries specified below)

Battery	Playback	Radio
Sony Alkaline LR6 (SG)	16 hours	48 hours
Sony R6P (SR)	4.5 hours	16 hours

#### Dimensions

94.2x 119.0 x 36.0 mm

#### Mass

260g incl. batteries and tape

#### Supplied Accessories

- Stereo headphones (1)
- Belt clip (1)

Design and specifications are subject to change without notice.

## RADIO CASSETTE PLAYER

# SONY®



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### 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.

### • HOW TO CHANGED THE CERAMIC FILTERS

This model is used two ceramic filters of CF2 and X2.

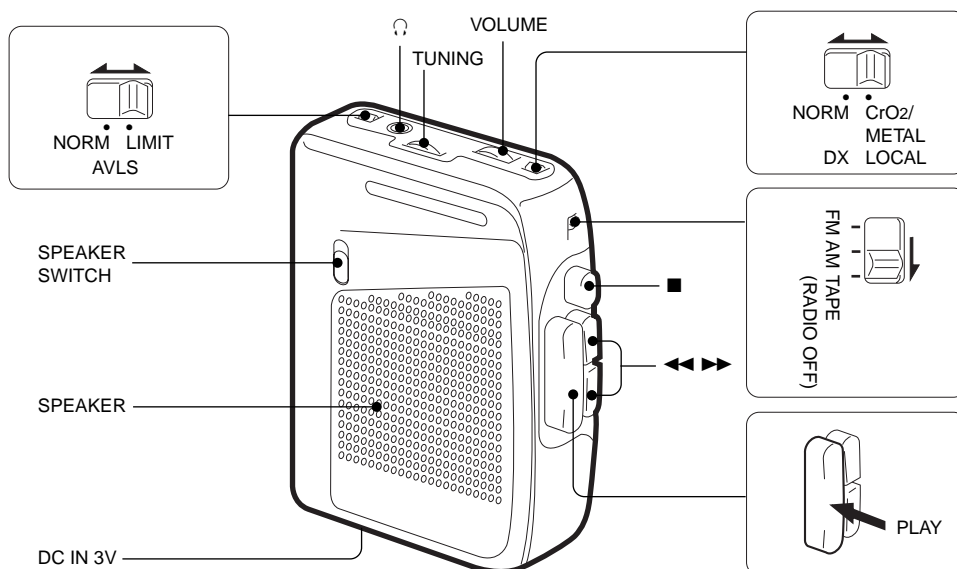
You must used same type of color marked ceramic filters in order to meet same specifications.

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

## SECTION 1 GENERAL

### LOCATION AND FUNCTION OF CONTROLS



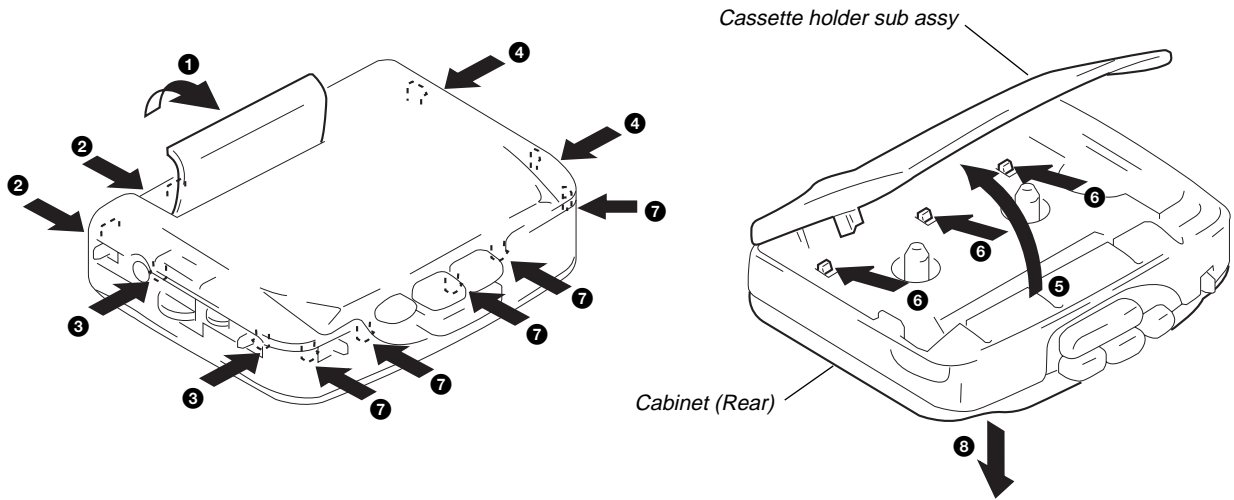
## SECTION 2 DISASSEMBLY

● The equipment can be removed using the following procedure.

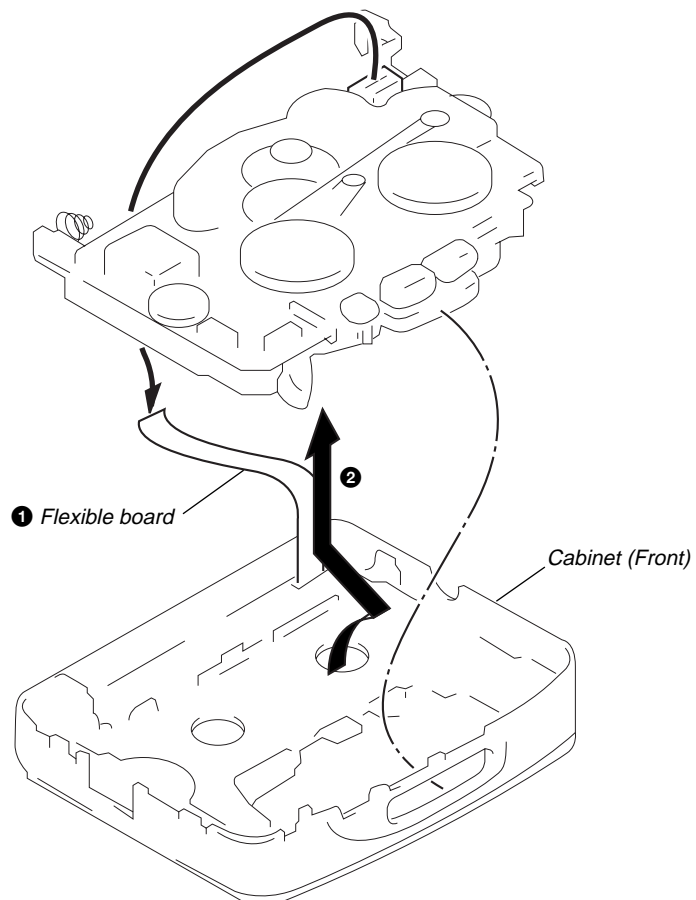
Set → Cabinet (Rear) → Cabinet (Front) → Main board, Mechanism deck → Cassette holder sub assy → Switch board

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

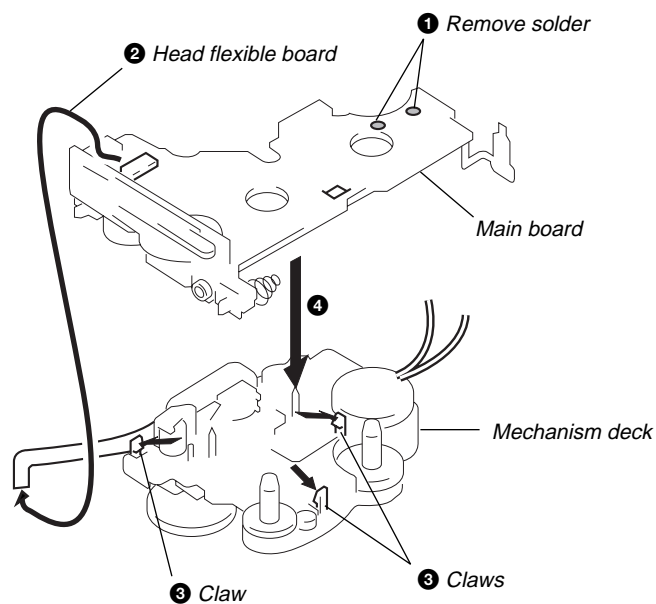
### 2-1. CABINET (REAR) REMOVAL



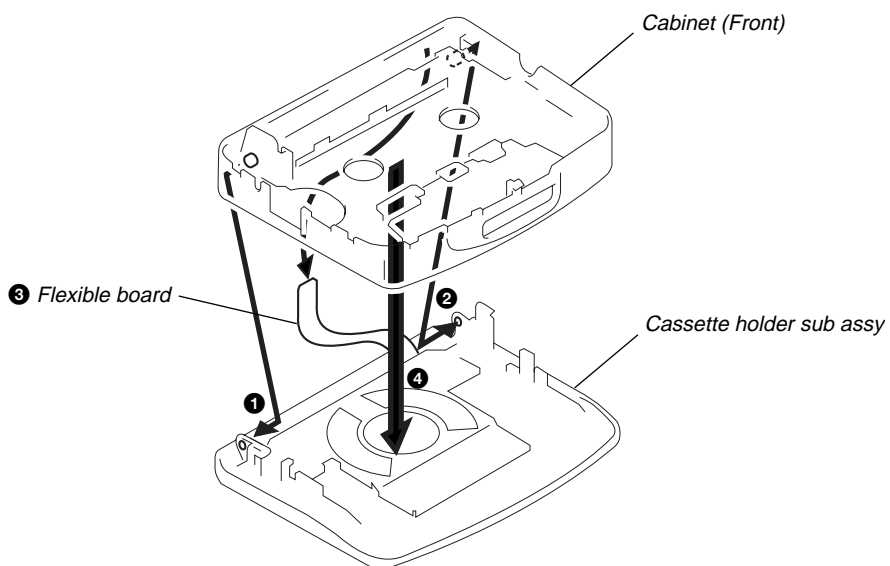
### 2-2. CABINET (FRONT) REMOVAL



### 2-3. MAIN BOARD, MECHANISM DECK REMOVAL



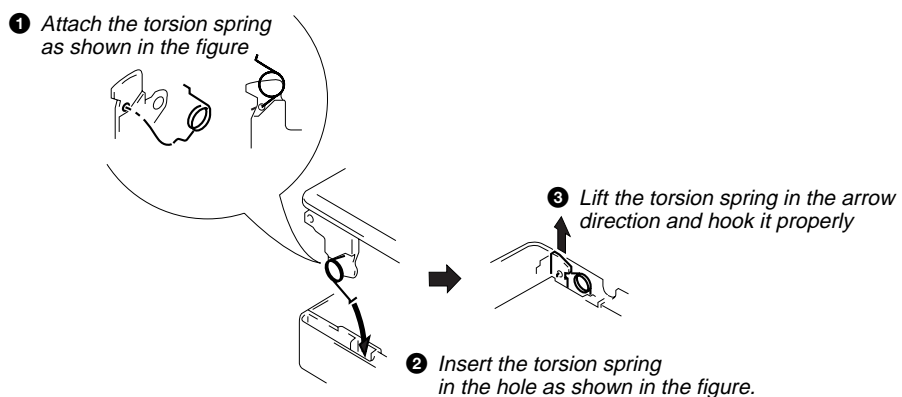
### 2-4. CASSETTE HOLDER SUB ASSY REMOVAL



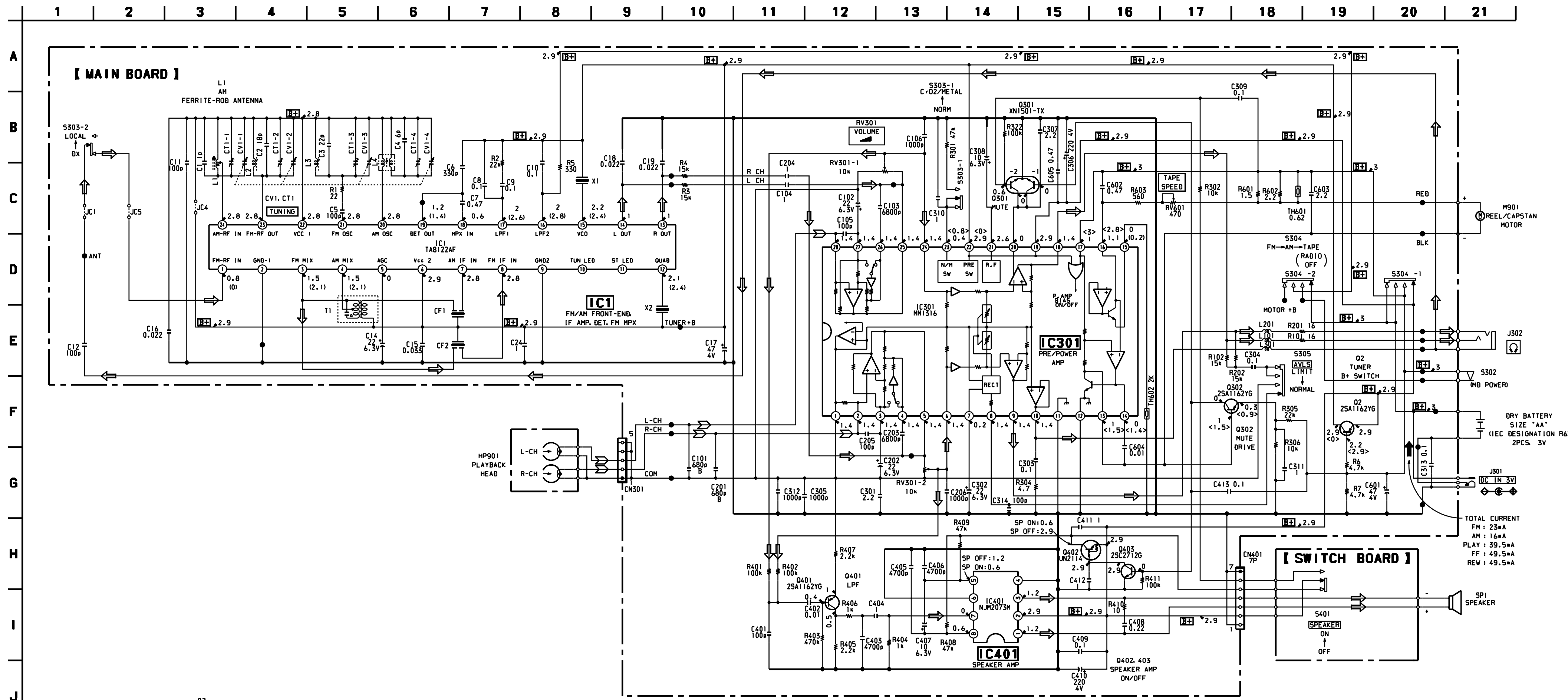
### NOTE FOR INSTALLATION

The torsion spring will be removed together with the cassette lid that perform the following for installation.

#### ● TORSION SPRING

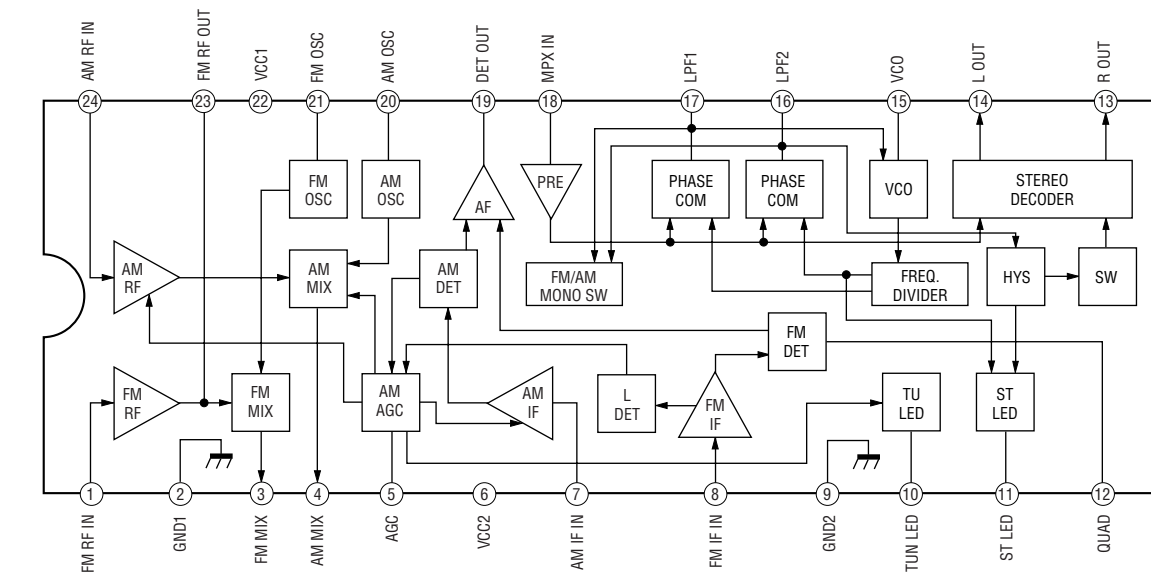






• IC BLOCK DIAGRAM

IC1 TA8122AF



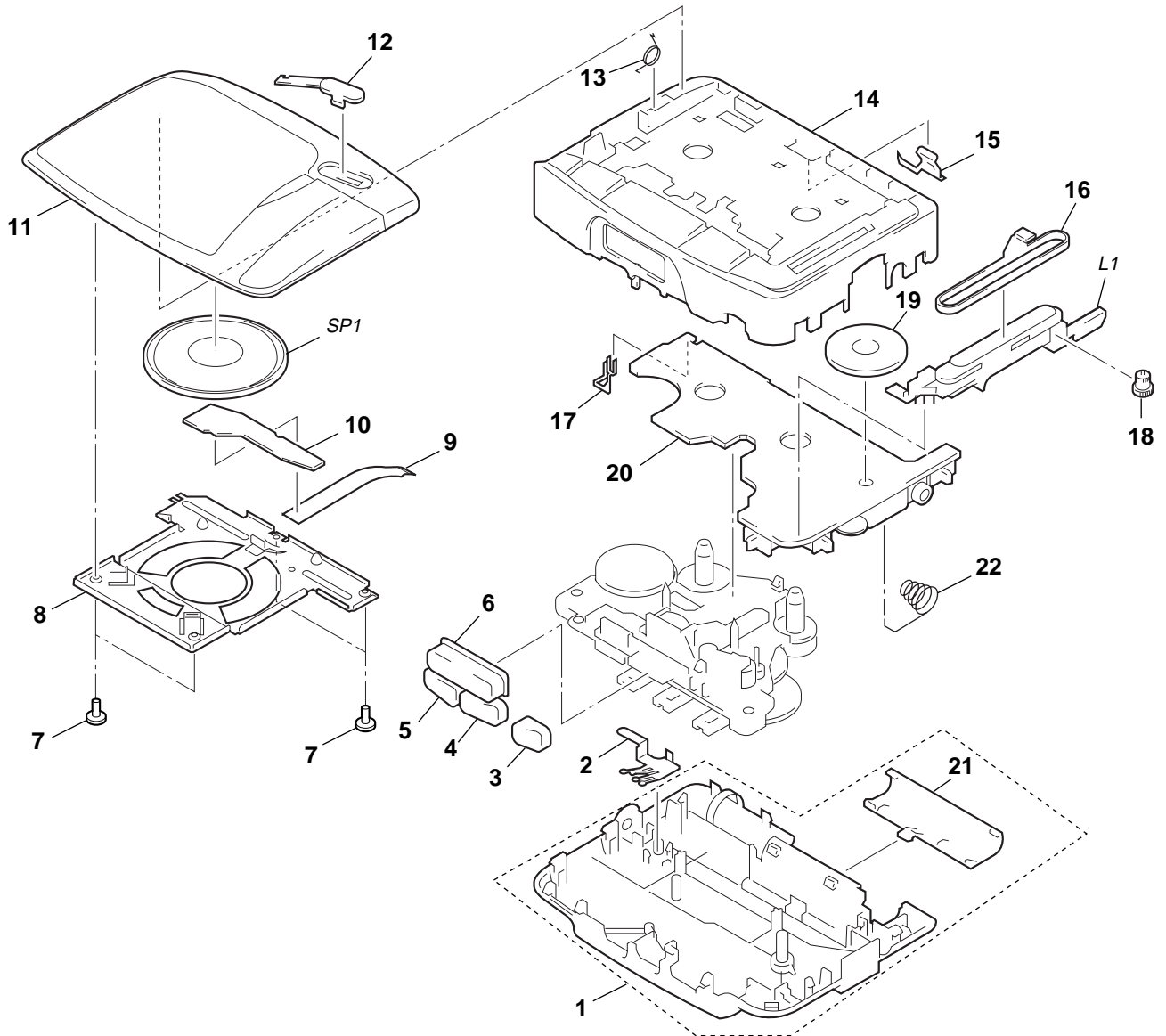
- Note:
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50 WV or less are not indicated except for electrolytics and tantalums.
  - All resistors are in  $\Omega$  and  $1/4\text{-}W$  or less unless otherwise specified.
  - $\Delta$  : internal component.
  - $\text{B+}$  : B+ Line.
  - $\square$  : adjustment for repair.
  - Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack (J301).
  - Voltages are dc with respect to ground under no-signal (detuned) conditions.
  - no mark : FM
  - ( ) : AM
  - < > : PLAY
  - Voltages are taken with a VOM (Input impedance 10 M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
  - Signal path.
  - $\Rightarrow$  : FM
  - $\nabla$  : PB

## SECTION 5 EXPLODED VIEWS

**NOTE :**

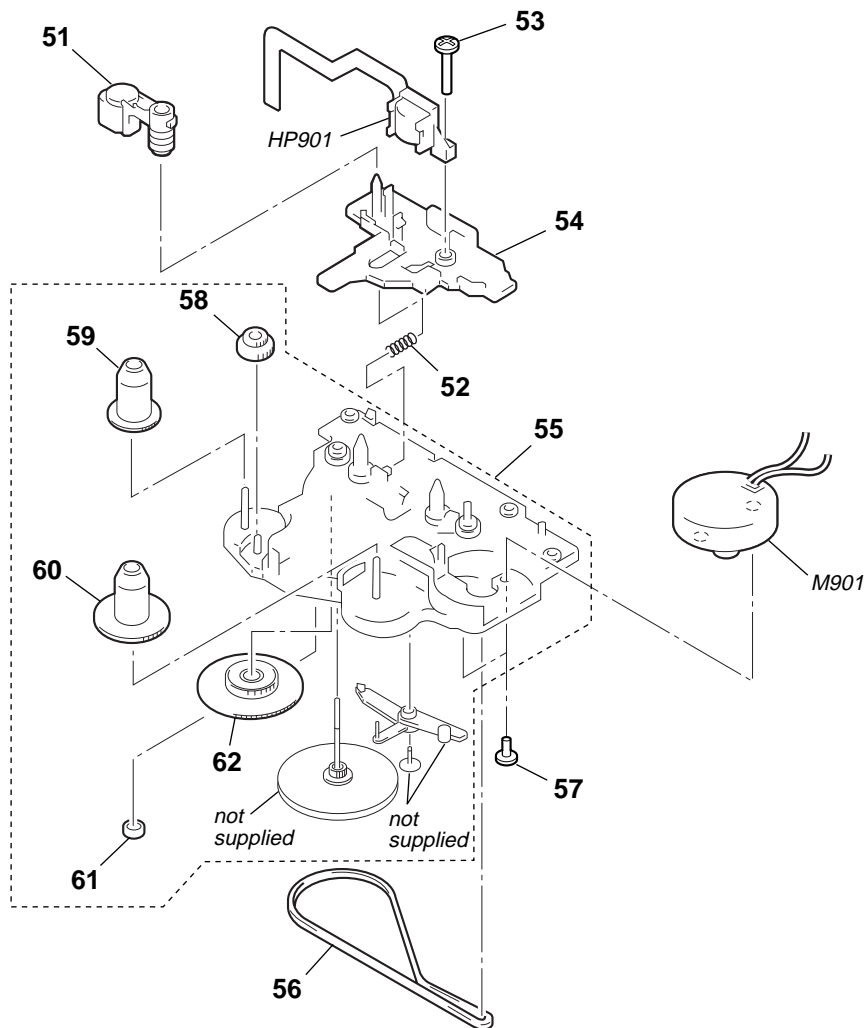
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked “ \* ” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.

### 5-1. CABINET AND BOARD SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-3374-460-1	CABINET (REAR) SUB ASSY		13	3-018-931-01	SPRING, TORSION	
2	3-910-896-01	GROUND, MOTOR		14	3-937-353-01	CABINET (FRONT) (CF-0)	
3	3-933-647-01	BUTTON (STOP)		15	3-364-675-01	SPRING (CASSETTE)	
4	3-933-644-01	BUTTON (FF)		16	3-933-678-01	POINTER	
5	3-933-643-01	BUTTON (REW)		17	3-933-642-01	TERMINAL (+), BATTERY	
6	3-933-646-01	BUTTON (PLAY)		18	3-933-675-01	GEAR (TUNE)	
7	3-318-382-01	SCREW (1.7X3), TAPPING		19	3-910-902-12	KNOB (TUNE)	
8	3-017-324-01	RETAINER, SPEAKER		20	A-3016-981-A	MAIN BOARD, COMPLETE	
9	1-667-057-11	FLEXIBLE BOARD		21	3-937-356-01	LID, BATT	
* 10	1-667-779-11	SWITCH BOARD		22	3-910-895-01	TERMINAL (-), BATTERY	
11	X-3374-461-1	HOLDER SUB ASSY, CASSETTE		L1	X-3371-847-1	ANTENNA SUB ASSY, FERRITE-ROD	
12	3-017-323-01	KNOB (SW)		SP1	1-505-794-11	SPEAKER	

## 5-2. MECHANISM DECK SECTION (MF-WMFX103-48CY)



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
51	X-3367-902-1	ARM (N) ASSY, PINCH		58	3-909-727-01	GEAR (REVERSE)	
52	3-364-328-01	SPRING, COMPRESSION		59	3-364-320-01	GEAR (S REEL)	
53	3-910-635-01	SCREW		60	3-910-640-01	GEAR (T REEL)	
54	3-910-647-01	LEVER (PR/O), PLAY		61	3-321-483-11	RING, RETAINING	
55	X-3368-729-1	CHASSIS ASSY		62	X-3367-905-1	CLUTCH ASSY	
56	3-354-868-01	BELT		HP901	1-500-115-11	HEAD, MAGNETIC (PLAYBACK)	
57	3-352-758-21	SCREW (M1.7), TOOTHED LOCK		M901	1-698-353-11	MOTOR, DC (REEL, CAPSTAN)	



## SECTION 6 ELECTRICAL PARTS LIST

MAIN

**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, -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

- 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 :  $\mu$  , for example :  
uA.... :  $\mu$  A.... , uPA.... :  $\mu$  PA....  
uPB.... :  $\mu$  PB.... , uPC.... :  $\mu$  PC....  
uPD.... :  $\mu$  PD....
- CAPACITORS  
uF :  $\mu$  F
- COILS  
uH :  $\mu$  H

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-3016-981-A	MAIN BOARD, COMPLETE *****		C308	1-126-157-11	ELECT	10uF 20% 16V
				C309	1-163-038-91	CERAMIC CHIP	0.1uF 25V
	3-910-895-01	TERMINAL (-), BATTERY		C310	1-164-234-11	CERAMIC CHIP	1uF 10V
	3-933-642-01	TERMINAL (+), BATTERY		C311	1-164-234-11	CERAMIC CHIP	1uF 10V
		< CAPACITOR >		C312	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C1	1-163-083-00	CERAMIC CHIP	1PF 50V	C313	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C2	1-163-099-00	CERAMIC CHIP	18PF 5% 50V	C314	1-163-117-00	CERAMIC CHIP	100PF 10% 50V
C3	1-163-101-00	CERAMIC CHIP	22PF 5% 50V	C401	1-163-117-00	CERAMIC CHIP	100PF 10% 50V
C4	1-163-089-00	CERAMIC CHIP	6PF 50V	C402	1-163-021-91	CERAMIC CHIP	0.01uF 5% 50V
C5	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	C403	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C6	1-163-003-11	CERAMIC CHIP	330PF 10% 50V	C404	1-164-234-11	CERAMIC CHIP	1uF 10V
C7	1-164-005-11	CERAMIC CHIP	0.47uF 25V	C405	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C8	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C406	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C9	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C407	1-126-157-11	ELECT	10uF 20% 16V
C10	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C408	1-164-222-11	CERAMIC CHIP	0.22uF 25V
C11	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	C409	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C12	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	C410	1-126-176-11	ELECT	220uF 20% 4V
C14	1-126-153-11	ELECT	22uF 20% 6.3V	C411	1-164-234-11	CERAMIC CHIP	1uF 10V
C15	1-163-078-11	CERAMIC CHIP	0.033uF 10% 25V	C412	1-164-234-11	CERAMIC CHIP	1uF 10V
C16	1-163-063-91	CERAMIC CHIP	0.022uF 10% 50V	C413	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C17	1-126-154-11	ELECT	47uF 20% 6.3V	C601	1-126-154-11	ELECT	47uF 20% 6.3V
C18	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V	C602	1-164-005-11	CERAMIC CHIP	0.47uF 25V
C19	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V	C603	1-164-505-11	CERAMIC CHIP	2.2uF 16V
C24	1-164-234-11	CERAMIC CHIP	1uF 10V	C604	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C101	1-163-007-11	CERAMIC CHIP	680PF 10% 50V	C605	1-164-005-11	CERAMIC CHIP	0.47uF 25V
C102	1-126-153-11	ELECT	22uF 20% 6.3V			< FILTER >	
C103	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V	CF1	1-527-870-00	FILTER	
C104	1-164-234-11	CERAMIC CHIP	1uF 10V	CF2	1-578-672-71	FILTER, CRYSTAL	
C105	1-163-117-00	CERAMIC CHIP	100PF 5% 50V			< CONNECTOR >	
C106	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	CN301	1-569-252-21	HOUSING, CONNECTOR (FPC) 5P	
C201	1-163-007-11	CERAMIC CHIP	680PF 10% 50V	CN401	1-565-289-11	HOUSING, CONNECTOR 7P	
C202	1-126-153-11	ELECT	22uF 20% 6.3V			< TRIMMER >	
C203	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V	CT1	1-141-567-11	CAP, VAR (TUNING)	
C204	1-164-234-11	CERAMIC CHIP	1uF 10V			< VARIABLE CAPACITOR >	
C205	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	CV1	1-141-567-11	CAP, VAR (TUNING)	
C206	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V			< IC >	
C301	1-164-505-11	CERAMIC CHIP	2.2uF 16V	IC1	8-759-230-39	IC TA8122AF	
C302	1-126-153-11	ELECT	22uF 20% 6.3V	IC301	8-759-497-06	MM1316AFBE	
C303	1-163-038-91	CERAMIC CHIP	0.1uF 25V				
C304	1-163-038-91	CERAMIC CHIP	0.1uF 25V				
C305	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V				
C306	1-126-176-11	ELECT	220uF 20% 4V				
C307	1-164-505-11	CERAMIC CHIP	2.2uF 16V				

MAIN

SWITCH

Ref. No.	Part No.	Description	Remark
IC401	8-759-702-02	IC NJM062M	
		< JACK >	
J301	1-750-061-11	JACK,DC(POLARITY UNIFIED TYPE)(DC IN 3V)	
J302	1-565-287-11	JACK (⊖)	
		< JUMPER RESISTOR >	
JC1	1-216-295-00	METAL CHIP 0 5% 1/10W	
JC4	1-216-295-00	METAL CHIP 0 5% 1/10W	
JC5	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< COIL >	
L1	X-3371-847-1	ANTENNA SUB ASSY, FERRITE-ROD	
L2	1-460-120-11	COIL (WITH CORE)	
L3	1-403-696-11	COIL (WITH CORE)	
L4	1-406-408-11	COIL (OSC)	
L101	1-500-245-11	INDUCTOR	
L201	1-500-245-11	INDUCTOR	
L301	1-412-006-31	INDUCTOR CHIP 10uH	
		< TRANSISTOR >	
Q2	8-729-216-22	TRANSISTOR 2SA1162-G	
Q301	8-729-402-13	TRANSISTOR XN1501	
Q302	8-729-216-22	TRANSISTOR 2SA1162-G	
Q401	8-729-216-22	TRANSISTOR 2SA1162-G	
Q402	8-729-207-73	TRANSISTOR RN2407	
Q403	8-729-230-49	TRANSISTOR 2SC2712-YG	
		< RESISTOR >	
R1	1-216-009-00	METAL CHIP 22 5% 1/10W	
R2	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R3	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R4	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R5	1-216-037-00	METAL CHIP 330 5% 1/10W	
R6	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R7	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R101	1-216-006-11	METAL GLAZE 16 5% 1/10W	
R102	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R201	1-216-006-11	METAL GLAZE 16 5% 1/10W	
R202	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R301	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R302	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R304	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R305	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R306	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R322	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R401	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R402	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R403	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R404	1-216-049-91	METAL CHIP 1K 5% 1/10W	
R405	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R406	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R407	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R408	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R409	1-216-089-91	METAL GLAZE 47K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R410	1-216-001-00	METAL CHIP 10 5% 1/10W	
R411	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R601	1-217-905-11	METAL GLAZE 1.5 5% 1/10W	
R602	1-216-298-00	METAL CHIP 2.2 5% 1/10W	
R603	1-216-043-91	METAL GLAZE 560 5% 1/10W	
		< VARIABLE RESISTOR >	
RV301	1-225-578-11	RES, VAR, CARBON (▲ VOLUME)	
RV601	1-225-252-11	RES, ADJ, CARBON 470 (TAPE SPEED)	
		< SWITCH >	
S302	1-571-986-11	SWITCH, LEAF (MD POWER)	
S303	1-692-298-11	SWITCH, SLIDE (LOCAL/DX, NORM/METAL)	
S304	1-692-299-11	SWITCH, SLIDE (FM, AM, TAPE RADIO OFF)	
S305	1-692-898-11	SWITCH, SLIDE (AVLS)	
		< TRANSFORMER >	
T1	1-404-949-11	TRANSFORMER, IF	
		< THERMISTOR >	
TH601	1-809-279-11	THERMISTOR, POSITIVE	
TH602	1-810-764-11	THERMISTOR, POSITIVE	
		< FILTER >	
X1	1-577-091-11	OSCILLATOR, CRYSTAL	
X2	1-578-672-71	FILTER, CRYSTAL	
*****			
*	1-667-779-11	SWITCH BOARD	
		*****	
	1-667-057-11	FLEXIBLE BOARD	
		< SWITCH >	
S401	1-572-922-11	SWITCH, SLIDE (SPEAKER)	
*****			
		MISCELLANEOUS	
		*****	
9	1-667-057-11	FLEXIBLE BOARD	
HP901	1-500-115-11	HEAD, MAGNETIC (PLAYBACK)	
L1	X-3371-847-1	ANTENNA SUB ASSY, FERRITE-ROD	
M901	1-698-353-11	MOTOR, DC (REEL, CAPSTAN)	
SP1	1-505-794-11	SPEAKER	
*****			
		ACCESSORIES & PACKING MATERIALS	
		*****	
	3-861-236-21	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE)	
	8-953-130-90	HEADPHONE MDR-E801//K SET	
	X-3372-629-1	CLIP ASSY, BELT	