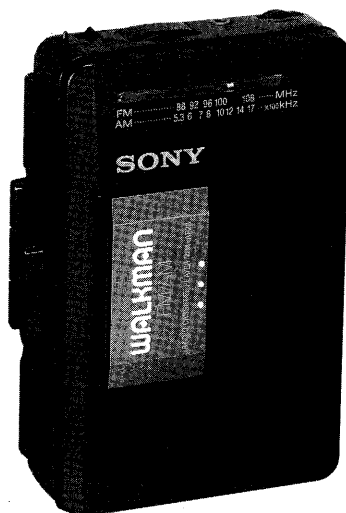


WM-AF23

SERVICE MANUAL

US Model



Model Name Using Similer Mechanism	WM-AF22
Tape Transport Mechanism Type	MF-WMAF23-04

SPECIFICATIONS

Radio

FM: 87.6—108 MHz

AM: 530—1710 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)

Rechargeable battery kit (Only for WM-AF29)

Optional accessories

Rechargeable battery (BP-700)/charger (BC-700) kit
BPC-700K*

AC power adaptor AC-D2L

Car battery cord DCC-70

Battery case EBP-500B

Stereo active speaker system SRS-30, SRS-50

Design and specifications subject to change without notice.

RADIO CASSETTE PLAYER
SONY®



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.

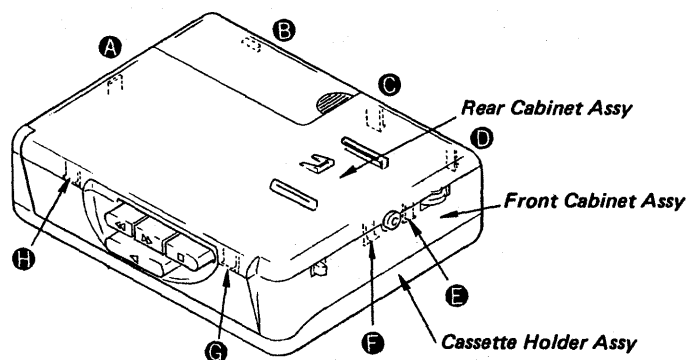
Notes on chip component replacement

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

SECTION 1 DISASSEMBLY

Location and shape of claws

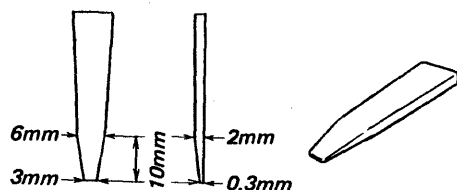
The symbols (A—H) show the order to uncouple the linkage of the claw, and names of the parts.



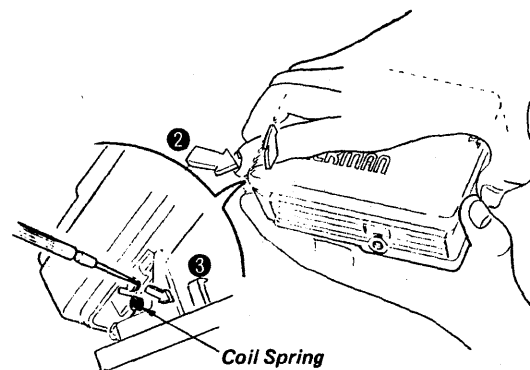
Note: Follow the disassembly procedure the numerical order given.

Tools: Precision Screwdrivers ($\ominus$, width 0.8mm, 1.4mm, and 2.0mm)
Adhesive tape 1–2cm
Wedge (hand made)

Material . . . soft plastic (such as PVC) etc.
Sizes are for the reference.

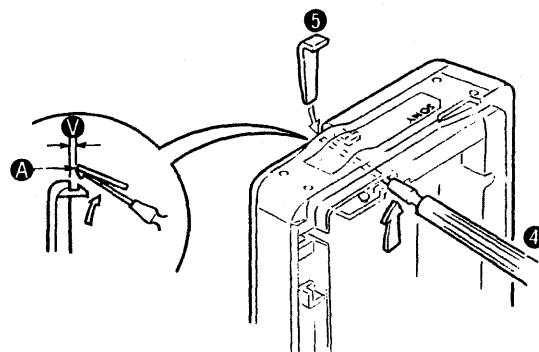


[1] Cassette Holder Removal

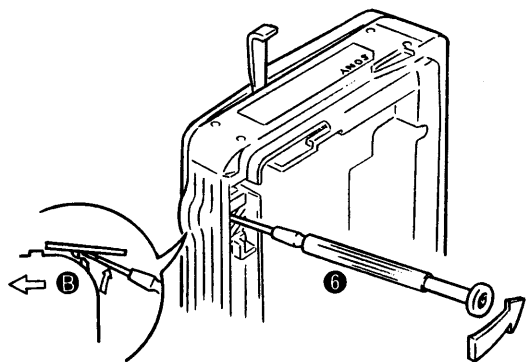


- ① Open the cassette holder.
- ② While pressing the edge of the cassette holder, pull up it in order to take off the cassette holder.
- ③ Take off the end of coil spring with a precision screwdriver (width: 0.8mm).

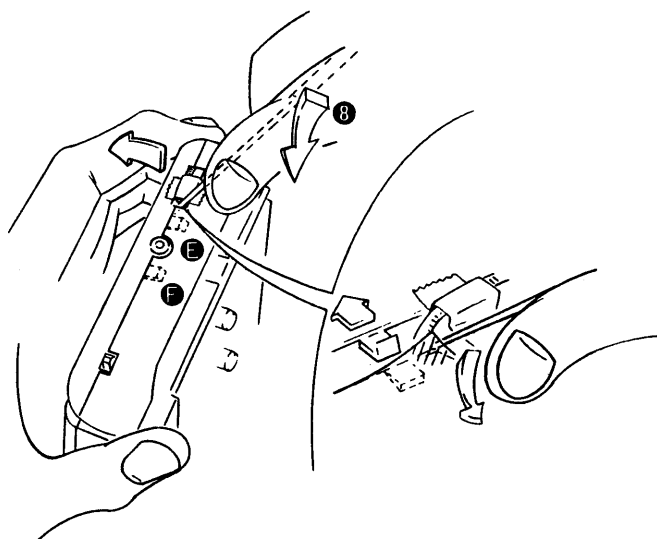
[2] Rear Cabinet Removal



- ④ Insert a precision screwdriver (width: 2.0mm) into the slit of front cabinet, lift the front cabinet as shown in the figure for making a clearance (V).
Insert a wedge in the clearance.

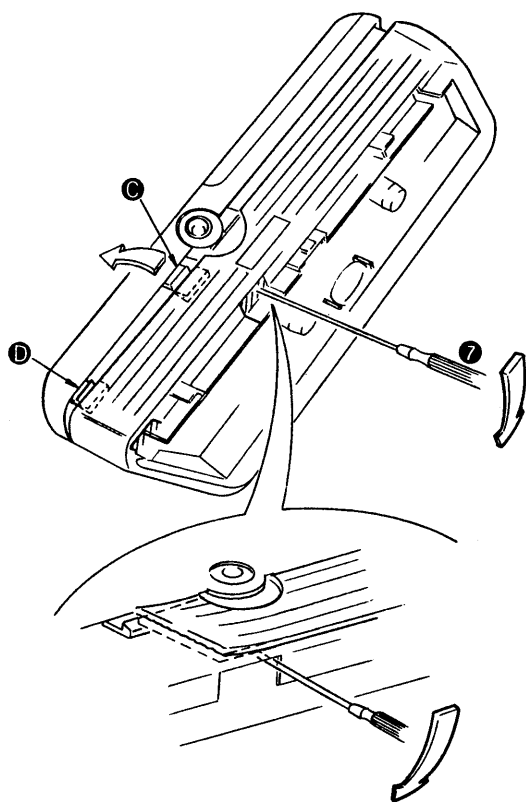


- ⑥ Insert a precision screwdriver (width: 2.0mm), and lift the front cabinet so that the claw ③ comes off.

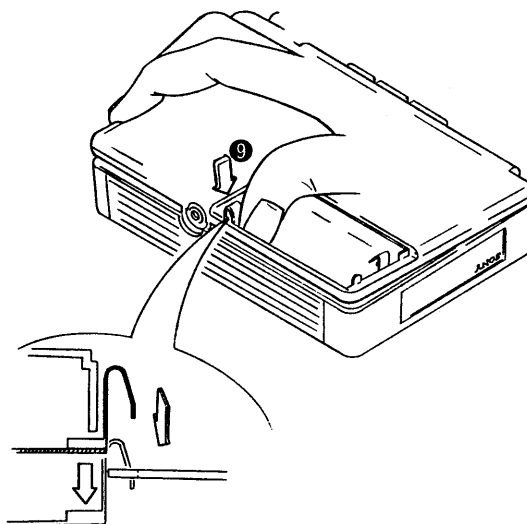


- ⑧ Put a adhesive tape on the volume for protection. Insert a precision screwdriver (width: 1.4 mm) and lift the shaded portion, so that the claw ⑤ and ⑥ come off.

CAUTION: Be sure not to touch the volume knob, when inserting precision screwdriver.



In a similar way as procedure ⑥, uncouple the linkage of the claw ③ and ④.



- ⑨ Press down the battery terminals in order to leave Mounted PCB in the rear cabinet, and then remove the rear cabinet.

SECTION 2

MECHANICAL AND ELECTRICAL ADJUSTMENTS

MECHANICAL ADJUSTMENTS

PRECAUTION

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

playback head	pinch roller
capstan	idlers
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 unless otherwise noted.

Torque Measurement

Torque	Meter Reading	Torque Meter
Forward	22-45g · cm (0.31-0.63oz · inch)	CQ-102C
Fast Forward	55-130g · cm (0.77-1.82oz · inch)	CQ-201B
Rewind	55-150g · cm (0.77-2.1oz · inch)	CQ-201B
Back Tension	1-2g · cm (0.014-0.028oz · inch)	CQ-102C

Tape Tension Measurement

Meter	Meter Reading
CQ-403A	more than 90g (1.26oz)

ELECTRICAL ADJUSTMENTS

CASSETTE SECTION

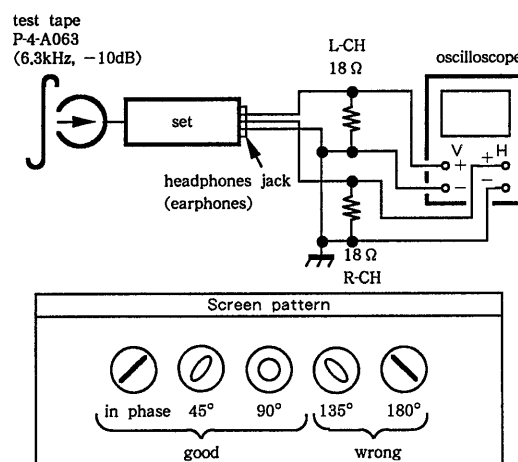
Playback Head Phase Check

Note : When replacing the head, check the both L-ch and R-ch phases.

Procedure :

Phase Check

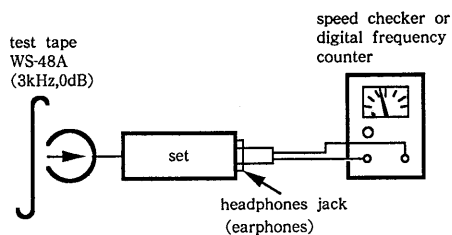
Mode : playback



Tape Speed Adjustment

Procedure :

Mode : playback

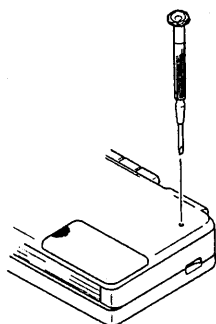


Specification :

speed checker	digital frequency counter
	2,995 – 3,025Hz

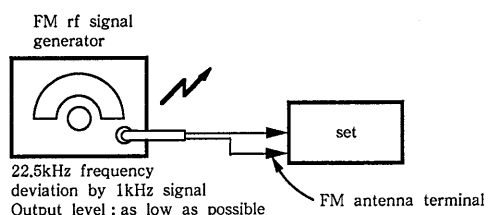
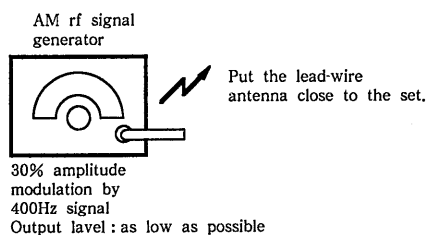
Frequency difference between the beginning and the end of the tape should be within $\pm 1.5\%$ ($\pm 45\text{Hz}$).

Adjustment Location



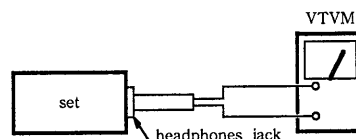
ELECTRICAL ADJUSTMENTS

TUNER SECTION



Note :

For adjustment of SENS SW(S301) at DX.



- 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	86.0MHz	L3	maximum
f maximum	109.5MHz	CT3	maximum

FM Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
86.0MHz	L2	maximum
109.5MHz	CT2	maximum

MW Frequency Coverage Adjustment

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	505kHz	L4	maximum
f maximum	1,720kHz	CT4	

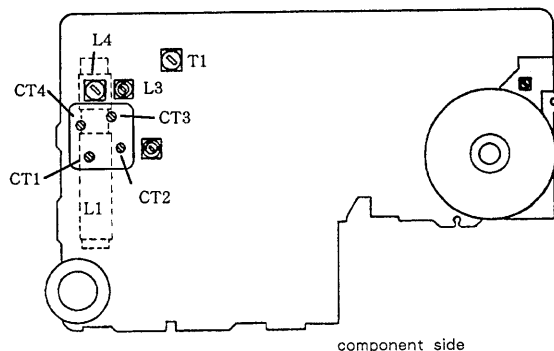
MW Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
620kHz	L1	maximum
1,400kHz	CT1	

MW IF Alignment

SG and set frequency	Adjustment part	Reading on VTVM
455kHz	T1	maximum

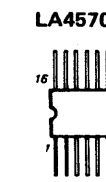
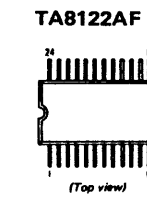
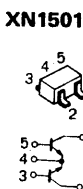
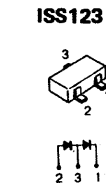
ADJUSTMENT LOCATION



SECTION 3
DIAGRAMS

- Note:
- : parts extracted from the component side.
 - : parts extracted from the conductor side.
 - : parts mounted on the conductor side.
 - : indicates side identified with part number.
 - ⊗ : Through hole.
 - ▨ : Pattern of the rear side.
 - : printed resistor.

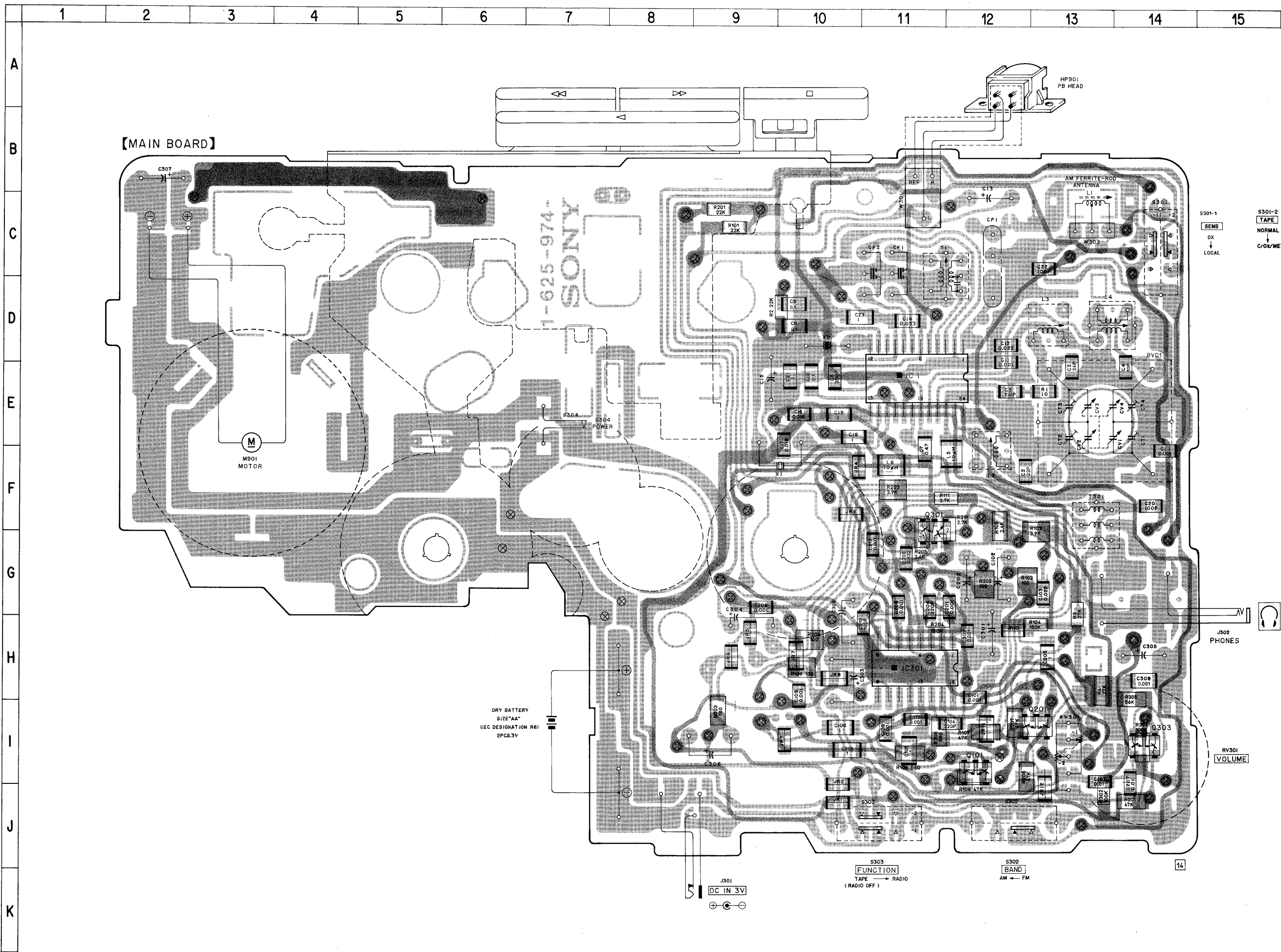
Semiconductor Lead Layouts



Semiconductor Location

Ref.No	Location
IC1	E-11
IC301	H-11
Q101	I-12
Q201	I-13
Q301	F-11
Q303	I-14

3-1. PRINTED WIRING BOARDS



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----



 : internal component.
 : printed resistor.

SECTION 4

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.

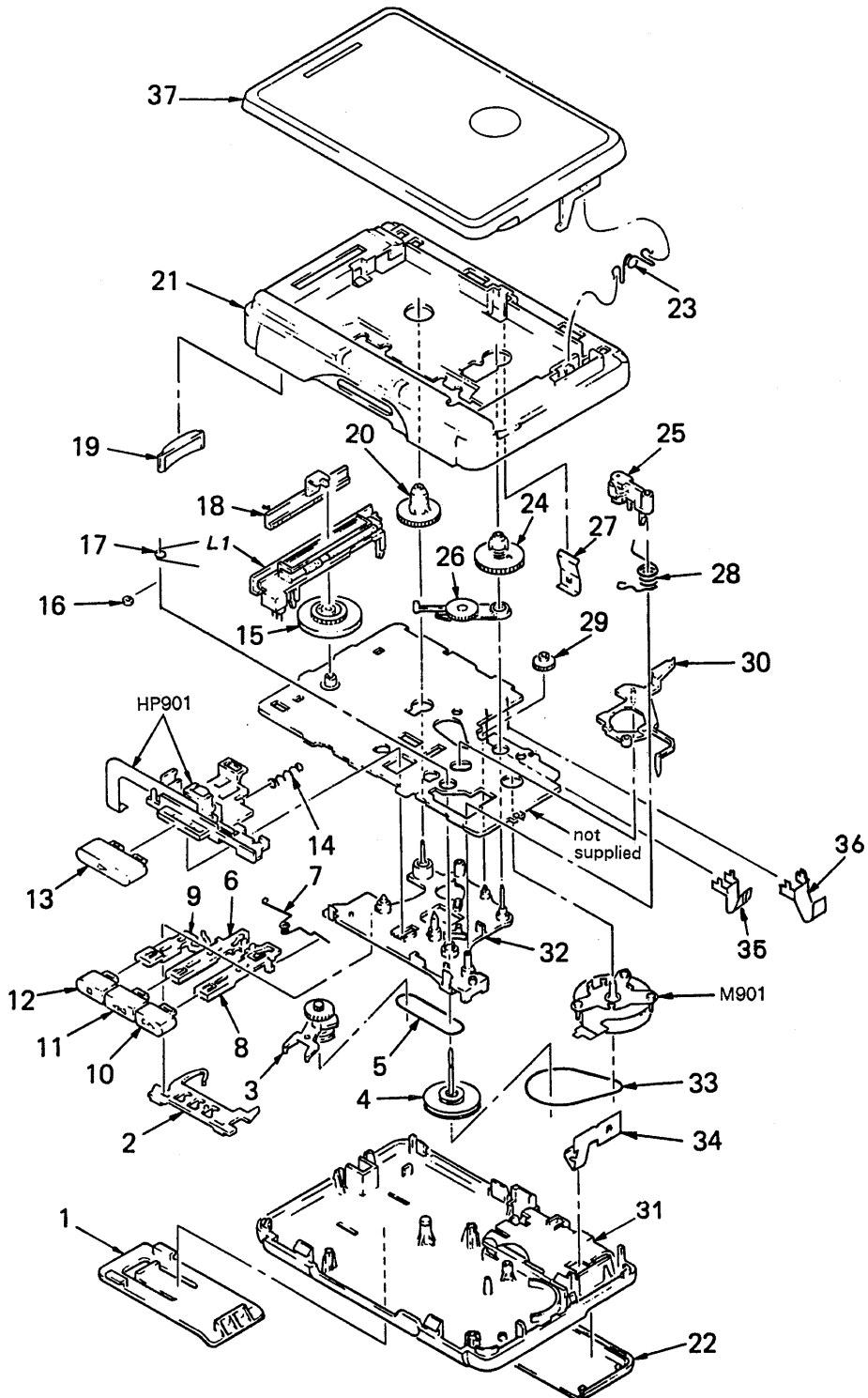
Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

Color Indication of Appearance Parts
Example:

(RED) ... KNOB, BALANCE (WHITE)

↑ ↑

Cabinet's Color Parts Color



<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
1	3-346-518-01	CLIP, BELT		20	3-346-525-01	GEAR (S REEL)	
2	3-346-522-01	PLATE, LOCK		21	3-352-501-01	CABINET FRONT	
3	X-3346-503-1	GEAR ASSY, MIDWAY		22	3-346-517-01	LID, BATTERY CASE	
4	X-3346-505-1	WHEEL ASSY, CAPSTAN		23	3-346-509-01	SPRING	
5	3-335-604-01	BELT, MIDWAY					
6	3-346-527-01	LEVER (REW)		24	X-3346-502-1	TABLE ASSY, T REEL	
7	3-346-539-01	SPRING (FR)		25	X-3334-005-1	PINCH ROLLER ASSY	
8	3-346-526-01	LEVER (FF)		26	X-3346-504-1	GEAR ASSY, PLAY	
9	3-346-528-01	LEVER (STOP)		27	3-346-516-01	SPRING	
				28	3-335-608-01	SPRING	
10	3-346-513-01	BUTTON (FF)		29	3-334-089-01	GEAR, FF	
11	3-346-514-01	BUTTON (REW)		30	3-346-523-01	LEVER (SHUT-OFF)	
12	3-346-515-01	BUTTON (STOP)		31	3-346-506-01	CABINET (REAR) (CF-C)	
13	3-346-512-01	BUTTON (PLAY)		32	X-3346-536-1	BASE ASSY (B), GUIDE	
14	3-335-605-01	SPRING, COMPRESSION					
15	3-346-502-01	KNOB (TU)		33	3-335-603-11	BELT, CAPSTAN	
16	3-343-358-01	RING, RETAINING		34	3-334-057-01	TERMINAL BOARD, RELAY	
17	3-346-538-01	SPRING (GROUND)		35	3-347-109-01	TERMINAL BOARD, PLUS	
18	3-346-503-01	POINTER		36	3-341-794-01	TERMINAL BOARD, MINUS	
19	3-346-504-01	COVER, KNOB		37	X-3346-702-1	HOLDER (CF-A)(1-B) ASSY, CASSETTE	

SECTION 5

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 F.

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...

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
C1	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		C303	1-124-434-00	ELECT	220MF	20%	4V
C2	1-163-101-00	CERAMIC CHIP 22PF	5%	50V		C304	1-124-434-00	ELECT	220MF	20%	4V
C3	1-163-102-00	CERAMIC CHIP 24PF	5%	50V		C305	1-126-157-11	ELECT	10MF	20%	6.3V
C4	1-163-093-00	CERAMIC CHIP 10PF	5%	50V		C306	1-124-434-00	ELECT	220MF	20%	4V
C5	1-163-100-00	CERAMIC CHIP 20PF	5%	50V		C307	1-124-432-00	ELECT	47MF	20%	4V
C6	1-163-129-00	CERAMIC CHIP 330PF	10%	50V		C308	1-163-205-00	CERAMIC CHIP 0.001MF	10%	50V	
C7	1-162-637-11	CERAMIC CHIP 0.47MF		16V		C309	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C8	1-163-077-00	CERAMIC CHIP 0.1MF		50V		CF1	1-527-870-00	FILTER (455kHz)			
C9	1-163-077-00	CERAMIC CHIP 0.1MF		50V		CF2	1-577-344-71	FILTER, CERAMIC (10.7MHz)			
C10	1-163-077-00	CERAMIC CHIP 0.1MF		50V		CP1	1-236-022-11	FILTER, BAND PASS			
C11	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		HP901	A-3108-292-A	PC BOARD ASSY, HEAD			
C12	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V		IC1	8-759-230-39	IC TA8122AF			
C13	1-126-153-11	ELECT	22MF	20%	6.3V	IC301	8-759-820-19	IC LA4570M			
C14	1-163-078-11	CERAMIC CHIP 0.033MF	10%	25V		J301	1-565-286-11	JACK, OUTER POWER			
C15	1-124-432-00	ELECT	47MF	20%	4V	J302	1-565-287-11	JACK (PHONES)			
C16	1-163-024-00	CERAMIC CHIP 0.018MF	10%	50V		JR1	1-216-295-00	METAL GLAZE	0	5%	1/10W
C17	1-163-024-00	CERAMIC CHIP 0.018MF	10%	50V		JR2	1-216-295-00	METAL GLAZE	0	5%	1/10W
C18	1-162-611-00	CERAMIC CHIP 1MF		25V		JR3	1-216-295-00	METAL GLAZE	0	5%	1/10W
C19	1-162-611-00	CERAMIC CHIP 1MF		25V		JR4	1-216-295-00	METAL GLAZE	0	5%	1/10W
C20	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		JR5	1-216-295-00	METAL GLAZE	0	5%	1/10W
C21	1-162-611-00	CERAMIC CHIP 1MF		25V		JR6	1-216-295-00	METAL GLAZE	0	5%	1/10W
C22	1-163-117-00	CERAMIC CHIP 100PF	5%	50V		JR7	1-216-296-00	METAL GLAZE	0	5%	1/8W
C23	1-162-611-00	CERAMIC CHIP 1MF		25V		JR8	1-216-296-00	METAL GLAZE	0	5%	1/8W
C101	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		JR9	1-216-296-00	METAL GLAZE	0	5%	1/8W
C102	1-124-432-00	ELECT	47MF	20%	4V	JR10	1-216-296-00	METAL GLAZE	0	5%	1/8W
C103	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V		JR11	1-216-296-00	METAL GLAZE	0	5%	1/8W
C104	1-163-125-00	CERAMIC CHIP 220PF	10%	50V		JR12	1-216-296-00	METAL GLAZE	0	5%	1/8W
C105	1-162-611-00	CERAMIC CHIP 1MF		25V		L1	1-402-412-21	ANTENNA, FERRITE-ROD (AM)			
C106	1-162-611-00	CERAMIC CHIP 1MF		25V		L2	1-459-843-11	COIL (WITH CORE)(FM RF)			
C107	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V		L3	1-459-845-11	COIL (WITH CORE)(FM OSC)			
C108	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		L4	1-406-331-21	COIL (AM OSC)			
C109	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		L5	1-410-204-31	INDUCTOR CHIP 10UH			
C112	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		L6	1-410-204-31	INDUCTOR CHIP 10UH			
C201	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		M901	1-541-572-11	MOTOR, DC			
C202	1-124-432-00	ELECT	47MF	20%	4V	PVC	1-151-629-11	CAP, VAR, POLYETHYLENE (WITH CT1-4, CV1-4)			
C203	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V		Q101	8-729-402-13	TRANSISTOR XN1501			
C204	1-163-125-00	CERAMIC CHIP 220PF	10%	50V		Q201	8-729-402-13	TRANSISTOR XN1501			
C205	1-162-611-00	CERAMIC CHIP 1MF		25V		Q301	8-729-402-19	TRANSISTOR XN6501			
C206	1-162-611-00	CERAMIC CHIP 1MF		25V		Q303	8-729-402-13	TRANSISTOR XN1501			
C207	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V		R1	1-216-001-00	METAL GLAZE	10	5%	1/10W
C208	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		R2	1-249-433-11	RES, CARBON	22K	5%	1/32W
C209	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V		R3	1-249-434-11	RES, CARBON	27K	5%	1/32W
C212	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V							
C213	1-163-117-00	CERAMIC CHIP 100PF	5%	50V							
C301	1-124-225-00	ELECT	100MF	20%	6.3V						
C302	1-124-434-00	ELECT	220MF	20%	4V						

Ref.No.	Part No.	Description
R4	1-249-434-11	RES, CARBON 27K 5% 1/32W
R101	1-249-433-11	RES, CARBON 22K 5% 1/32W
R102	1-249-405-11	RES, CARBON 100 5% 1/32W
R103	1-249-424-11	RES, CARBON 3.9K 5% 1/32W
R104	1-215-473-00	RES, CARBON 150K 5% 1/32W
R105	1-215-430-00	RES, CARBON 2.4K 5% 1/32W
R106	1-249-437-11	RES, CARBON 47K 5% 1/32W
R107	1-249-437-11	RES, CARBON 47K 5% 1/32W
R108	1-249-414-11	RES, CARBON 560 5% 1/32W
R109	1-249-405-11	RES, CARBON 100 5% 1/32W
R111	1-249-422-11	RES, CARBON 2.7K 5% 1/32W
R201	1-249-433-11	RES, CARBON 22K 5% 1/32W
R202	1-249-405-11	RES, CARBON 100 5% 1/32W
R203	1-249-424-11	RES, CARBON 3.9K 5% 1/32W
R204	1-215-473-00	RES, CARBON 150K 5% 1/32W
R205	1-215-430-00	RES, CARBON 2.4K 5% 1/32W
R206	1-249-437-11	RES, CARBON 47K 5% 1/32W
R207	1-249-437-11	RES, CARBON 47K 5% 1/32W
R208	1-249-414-11	RES, CARBON 560 5% 1/32W
R209	1-249-405-11	RES, CARBON 100 5% 1/32W
R211	1-249-422-11	RES, CARBON 2.7K 5% 1/32W
R301	1-249-437-11	RES, CARBON 47K 5% 1/32W
R302	1-249-441-11	RES, CARBON 100K 5% 1/32W
R303	1-249-408-11	RES, CARBON 180 5% 1/32W
R304	1-249-441-11	RES, CARBON 100K 5% 1/32W
R305	1-249-438-11	RES, CARBON 56K 5% 1/32W
RV301	1-238-072-11	RES, VAR, CABON 10K/10K (VOLUME)
S301	1-571-478-11	SWITCH, SLIDE (TAPE SELECTOR/RADIO SENS)
S302	1-571-478-11	SWITCH, SLIDE (BAND)
S303	1-571-478-11	SWITCH, SLIDE (FUNCTION)
S304	1-570-549-11	SWITCH, LEAF (POWER)
T1	1-404-791-11	TRANSFORMER (AM IF)
T301	1-409-444-11	COIL, TRAP
W301	*1-565-288-11	HOUSING, CONNECTOR 3P
W303	*1-565-285-11	HOUSING, CONNECTOR (PC BOARD) 3P
X1	1-577-091-11	OSCILLATOR, CRYSTAL (19kHz)
X2	1-577-344-71	FILTER, CERAMIC (10.7MHz)

ACCESSORY & PACKING MATERIAL

3-786-982-21	MANUAL, INSTRUCTION
3-351-508-01	TUBE, PROTECTION

Sony Corporation
Audio Group

9-953-583-11

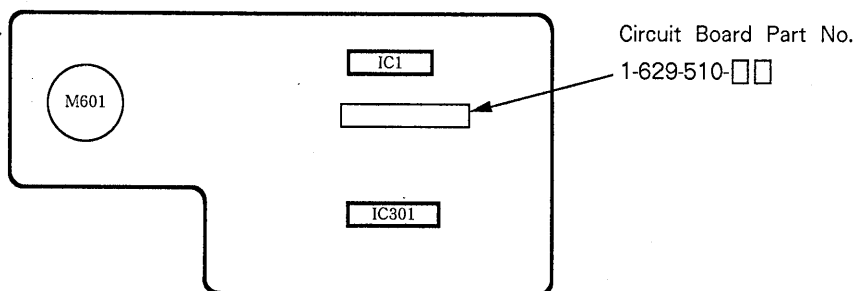
SONY[®] SERVICE MANUAL

US Model

SUPPLEMENT-1

File this Supplement with the Service Manual.

In regard to sets having the main circuit board No.1-629-510-□□, please refer to the information on the Canadian Model of WM-AF23 which can be found in the Service Manual of WM-AF23/AF29/BF23.



〈 Correction 〉

ACCESSORY & PACKING MATERIAL

addition 8-952-313-90 HEADPHONES MDR-005L