

WM-F2078

SERVICE MANUAL



US Model
 Canadian Model
 AEP Model
 UK Model
 E Model

Model Name Using Similar Mechanism	WM-AF23/BF23
Tape Transport Mechanism Type	MF-WMF2078-19

SPECIFICATIONS

Radio section

Frequency range FM: 87.5 - 108 MHz
 AM: US, Canadian, E model :
 530 - 1,710 kHz (10 kHz step)
 AEP, UK model :
 531 - 1,602 kHz (9 kHz step)
 Antennas FM: Headphone cord antenna
 AM: Built-in ferrite bar antenna

Tape player section

Frequency response (Dolby NR off)
 30 - 15,000 Hz
 Power output 10 mW + 10 mW, 16 ohms at DC
 operation
 Output Headphones (stereo minijack): load
 impedance 8 - 300 ohms
 Power requirements
 3 V DC, two R6 (size AA) batteries
 DC IN 3 V jack accepts:
 Optional Sony EBP-500B battery
 case for use with R20 (size D)
 batteries
 Optional Sony AC-D2M AC power
 adaptor
 US, Canadian model :
 120 V AC, 60 Hz
 UK model :
 240 V AC, 50 Hz
 AEP model :
 220 V AC, 50 Hz
 E model :
 120 V AC, 60 Hz or 220 V AC,
 50 Hz
 Optional Sony DCC-70 car battery
 cord for use with 12 V car battery

Battery life Approx. 6 hours of tape playback
 and approx. 16 hours of FM
 reception, using Sony alkaline
 batteries AM3 (N)
 Dimensions Approx. 97 x 119 x 43 mm (w/h/d)
 not incl. projecting parts and
 controls
 Weight Approx. 330 g, incl. batteries
 Accessories supplied
 Belt clip (1)
 Canadian, European and UK model:
 Stereo headphones (open-air type, 1)
 Other model: Stereo earphones
 (open-air type, 1)

Design and specifications subject to change without
 notice.

Note: If an AC power adaptor or a car battery cord not
 manufactured by Sony is used, a fuse must be installed
 in the AC power adaptor or the car battery cord and the
 polarity of the plug must be as illustrated.



RADIO CASSETTE PLAYER
SONY®



TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
Specifications		1
1. GENERAL		3
2. NOTE ON REPAIR		6
3. DISASSEMBLY		7
4. ADJUSTMENTS		
4-1. Mechanical Adjustments		8
4-2. Electrical Adjustments		8
5. DIAGRAMS		
5-1. IC Block Diagram		11
5-2. Printed Wiring Board		12
5-3. Schematic Diagram —Main Section—		15
5-4. Schematic Diagram —Display Section—		18
6. EXPLODED VIEWS		20
7. ELECTRICAL PARTS LIST		23

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.

WARNING !!**ADVARSEL!**

Lithiumbatteri – Eksplosionsfare
 Udskiftning må kun foretages
 af en sagkyndig, og som
 beskrevet i servicemanualen.

LITHIUM BATTERY

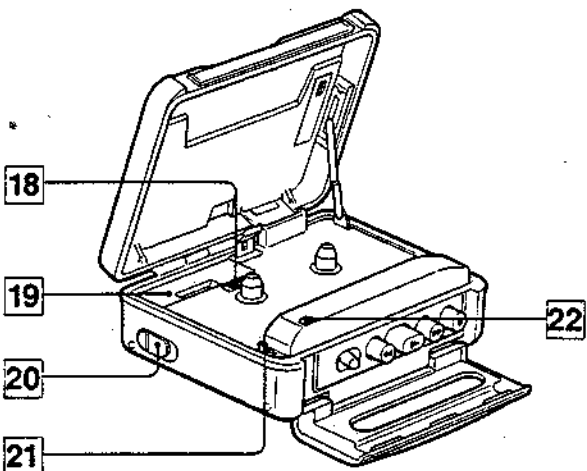
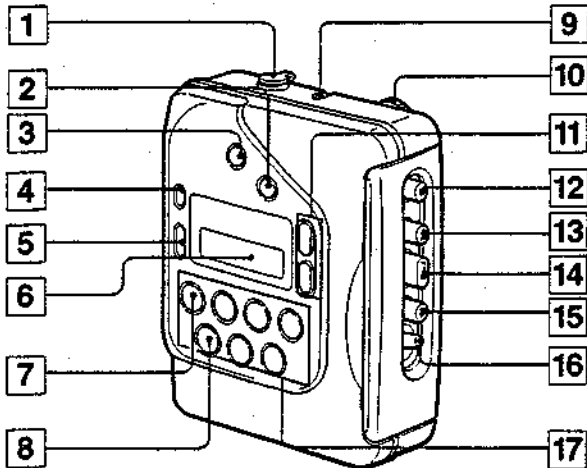
SHOULD ONLY BE CHANGED BY TECHNICAL
 PERSONNEL. THERE IS A RISK FOR EXPLOSION
 AT A WRONG HANDLING.

“Batteriet må kun udskiftes med et batteri af samme
 fabrikat og type”.

Because of the risk for explosion the battery must
 be replaced with the same type and manufacture.

SECTION 1 GENERAL


Parts Identification



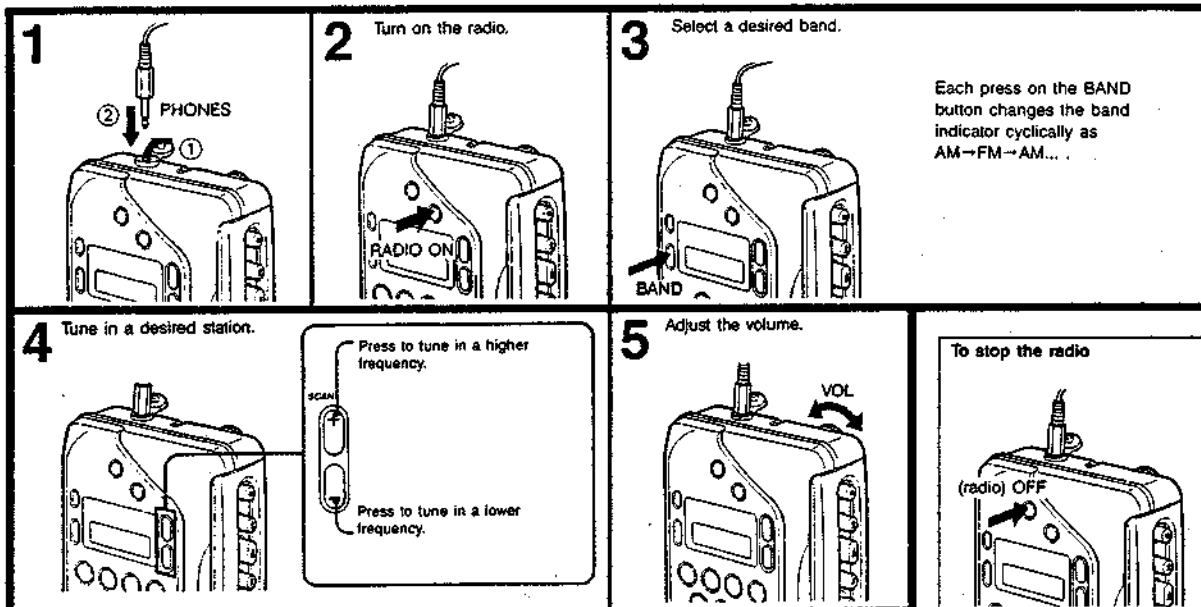
- 1 PHONES (headphones) jack
- 2 RADIO ON button
- 3 (radio) OFF button
- 4 MEMORY/TIME SET button
- 5 BAND select button
- 6 Display window
- 7 CLOCK button
- 8 ALARM button
- 9 OPR/BATT (operation/battery) indicator
- 10 VOL (volume) control
- 11 SCAN +/- button
- 12 ■ STOP button
- 13 ↑ (fast-forward) button
- 14 ▲ PLAY button
- 15 ▼ (rewind) button
- 16 DIRECTION (tape transport direction change) selector
- 17 Preset tuning (channel number) buttons
- 18 TAPE selector (NORM, CrO₂/ METAL)
- 19 Battery compartment lid
- 20 DC IN 3 V (external power input) jack
- 21 DOLBY NR OFF/ON, FM LOCAL/DX (MONO/ST) selector
- 22 MODE selector (↔/⇒)

Features

- The synthesized tuner can:
 - receive a station automatically
 - memorize 7 stations for each FM and AM.
- Auto-reverse function changes the tape playback direction without turning the cassette over.
- Water-resistant design
- Dolby NR* system reduces tape hiss noise during playback.
- TAPE selector for optimum playback with standard tapes as well as high-performance metal tapes

*Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

Radio Reception



To Scan the Stations

There are three ways to scan the stations.

—One step scan

Press a SCAN button repeatedly. You can scan a desired station manually. A beep sound follows each press and the frequency changes in the steps shown below.

AM: 10 kHz
FM: 0.1 MHz
(except for United Kingdom and European countries)

or

AM: 9 kHz
FM: 0.05 MHz

—Seeking scan

When you press the SCAN + or - button for more than half a second, the automatic tuning begins, and then stops automatically when a station is received.

To stop automatic tuning, press the SCAN + or - button again.

—Fast scan

Use the function to rapidly scan a station. Keep a SCAN button pressed. Fast scanning starts. Release the button when the scanning comes near a desired frequency. The scanning continues in the seeking scan mode.

Notes on radio reception

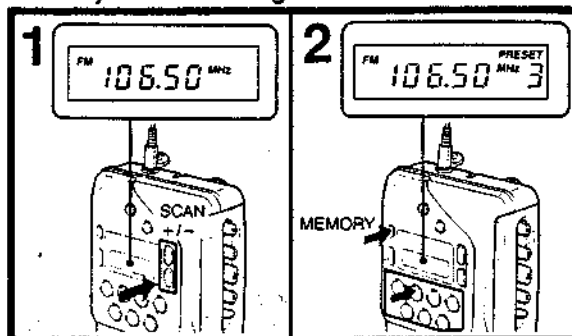
- When you press the tape operation buttons (▲ PLAY, ⏪ or ⏩) during radio reception, the indications on the display window will change to the current time display, the radio will be turned off and the unit will go in the tape operation mode. To restore radio reception, press the RADIO ON button again.
- The automatic tuning function may occasionally miss the best setting for a radio station. If this happens, press the SCAN + or - button to adjust the tuning.
- You should remove the cassette tape if it has a metallic cassette shell or labels. Such cassette may cause interference or difficulty in tuning.

When the battery becomes weak while listening to the radio

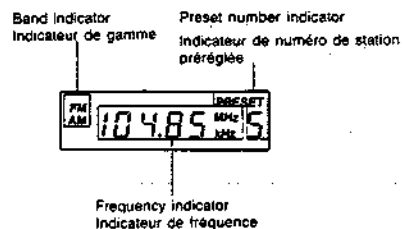
The radio will be turned off. In this case, try playing back a tape. If the "E" indicator appears on the display, replace the batteries with new ones.

When you press the RADIO ON button while listening to the radio, the current time will appear for about two seconds.

Memory Preset Tuning



Display window Fenêtre d'affichage



To memorize station frequencies

- 1 Tune in a desired station.
- 2 Press a desired preset tuning button while keeping the MEMORY button pressed.
The "PRESET" and the preset number indicators you have selected will appear on the display and the station will be memorized.

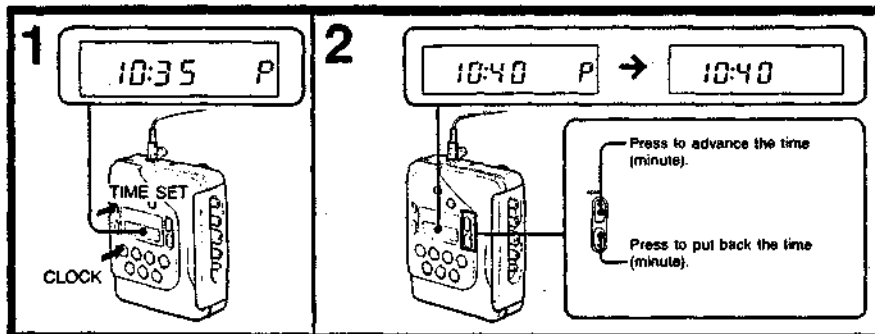
Repeat steps 1 and 2. Up to 7 stations each can be memorized for each band.
To turn off the radio, press the (radio) OFF button.

To tune in a preset station

- 1 Press the RADIO ON button to turn on the radio.
- 2 Select a desired band by pressing the BAND button.
- 3 Press a desired preset tuning button.
- 4 Adjust the volume.

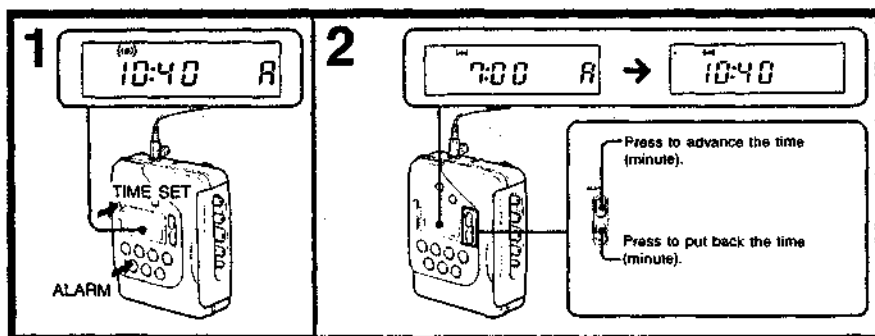
Clock Operation

To Set the Current Time Be sure to turn off the radio. You cannot set the clock and the alarm during radio reception.



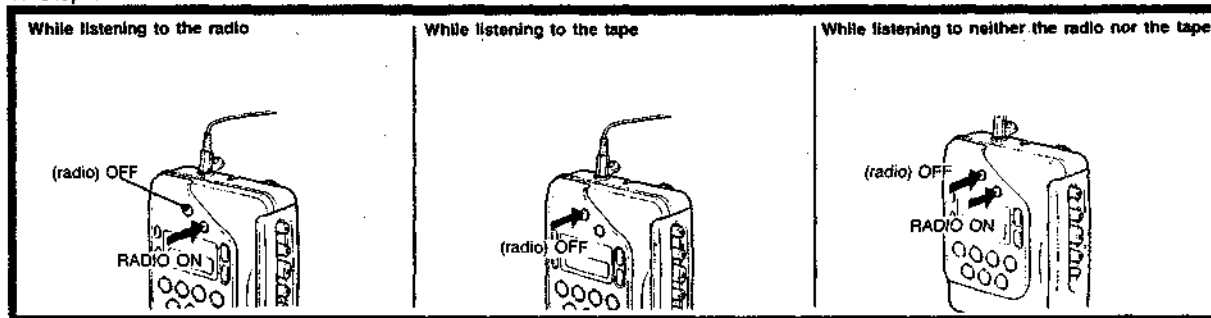
- 1 Press the CLOCK button (preset tuning button 1) while keeping the TIME SET button pressed. The "P" indicator will appear on the display. Be sure to keep the TIME SET button pressed until the current time setting is completed.
- 2 Set the time. After the current time setting is completed, release the TIME SET button. The "P" indicator will disappear.
 - When the SCAN + or - button is kept pressed, the digits advance rapidly.
 - The hour display is on:
 - a 24-hour cycle (for European countries)
 - a 12-hour cycle (for other countries)
 - Replace the batteries within about one hour, or the time you have set will be canceled.
 - The hour display advances by one when the minute display returns to "00" after "59".

To Set the Alarm



- 1 Press the ALARM button (preset tuning button 2) while keeping the TIME SET button pressed. The "A" and "(A)" indicators will appear on the display. Be sure to keep the TIME SET button pressed until the alarm setting is completed.
- 2 Set the time. After the alarm time setting is completed, release the TIME SET button. The display will return to the current time display. The "A" indicator will disappear, but the "(A)" indicator will remain on the display.

To Stop the Alarm



While listening to the radio

The alarm will be heard from the headphones. To stop the alarm, press the RADIO ON button. You can continuously listen to the radio. If you press the (radio) OFF button, the alarm and the radio are both stopped.

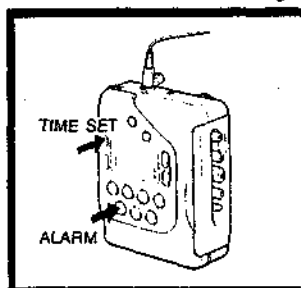
While listening to the tape

The alarm will be heard from the headphones. To stop the alarm, press the (radio) OFF button.

While listening to neither the radio nor the tape

The alarm will be heard from inside the unit (not from the headphones). Press the (radio) OFF button to stop the alarm, or press the RADIO ON button to stop the alarm and to turn on the radio. The "(A)" indicator on the display goes off when you stop the alarm.

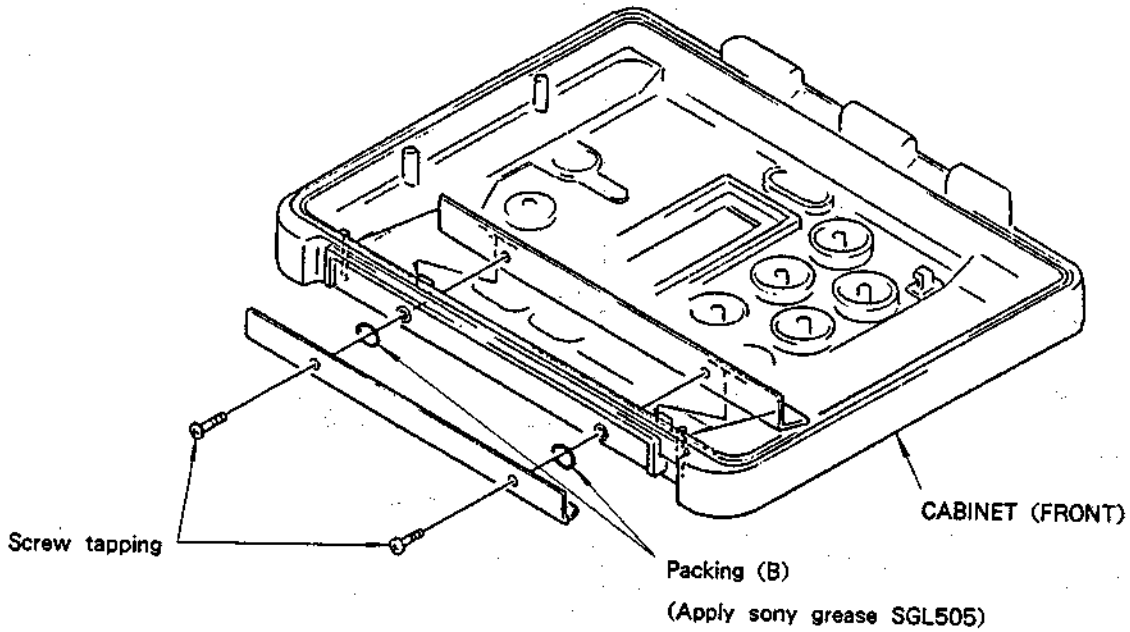
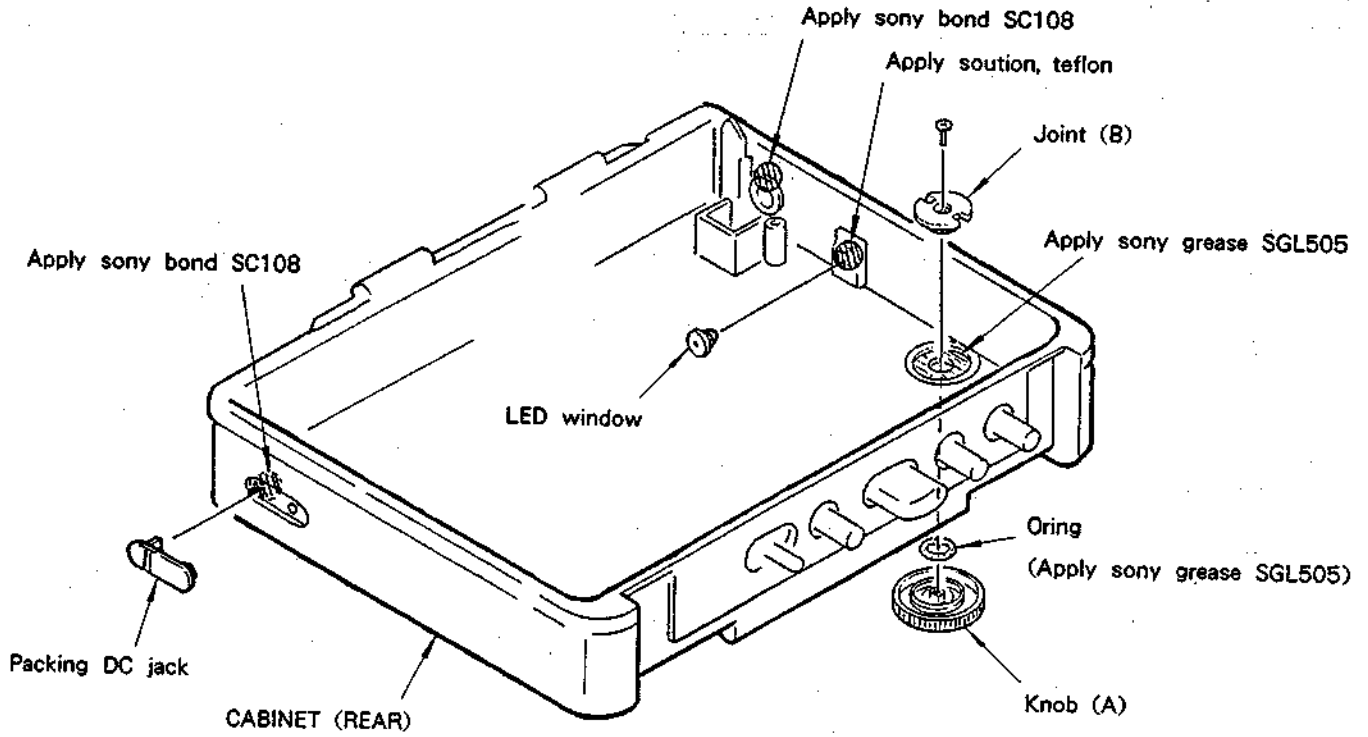
To Cancel the Alarm Setting



If you want to cancel the alarm, press the ALARM button (preset tuning button 2) twice while keeping the TIME SET button pressed. At the first pressing, the "A", "(A)" and alarm time indicators appear on the display and at the second pressing, the "(A)" indicator goes off and the alarm setting is canceled. Release the TIME SET button to return to the current time display.

SECTION 2 NOTE ON REPAIR

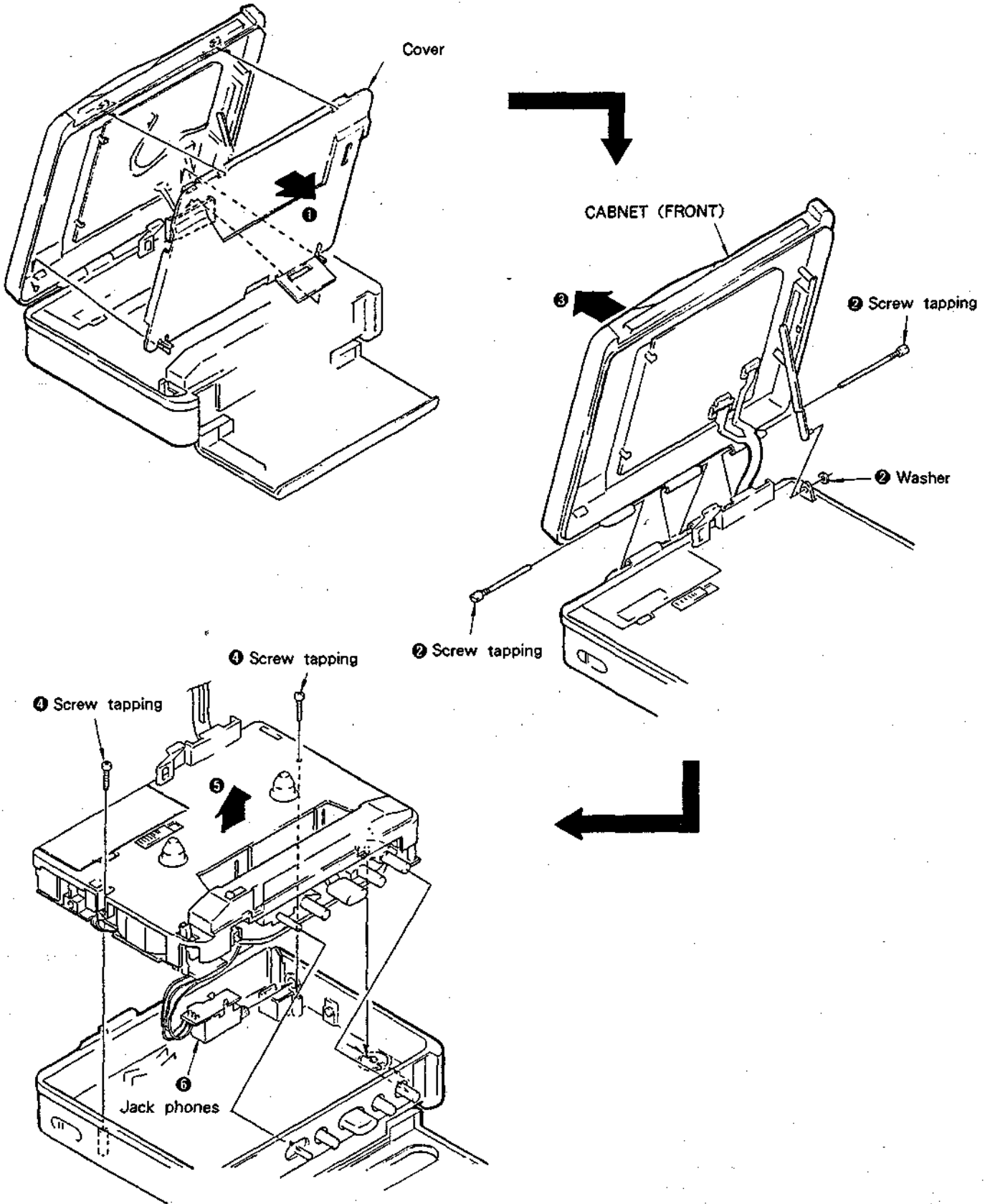
2-1. WATERPROOFED SECTION



- Solution teflon : 7-451-109-02
- Sony bond SC108 : 7-432-909-04
- Sony grease SGL-505 : 7-662-010-04

SECTION 3 DISASSEMBLY

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



SECTION 4 ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

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

playback	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-102D	20 — 35g·cm (0.27 — 0.48oz·inch)
FWD Back Tension		less than 3g·cm (less than 0.04oz·inch)
REV	CQ-102RC	20 — 35g·cm (0.27 — 0.48oz·inch)
REV Back Tension		less than 3g·cm (less than 0.04 oz·inch)
FF, REW	CQ-201B	more than 60g·cm (more than 0.83 oz·inch)

Tape Tension Measurement

Mode	Torque meter	Meter reading
FWD	CQ-403A	more than 65g·cm
REV	CQ-403R	(more than 0.89oz·inch)

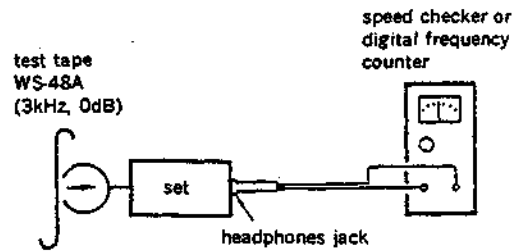
4-2. ELECTRICAL ADJUSTMENTS

CASSETTE SECTION

Tape Speed Adjustment

Procedure :

Mode : playback

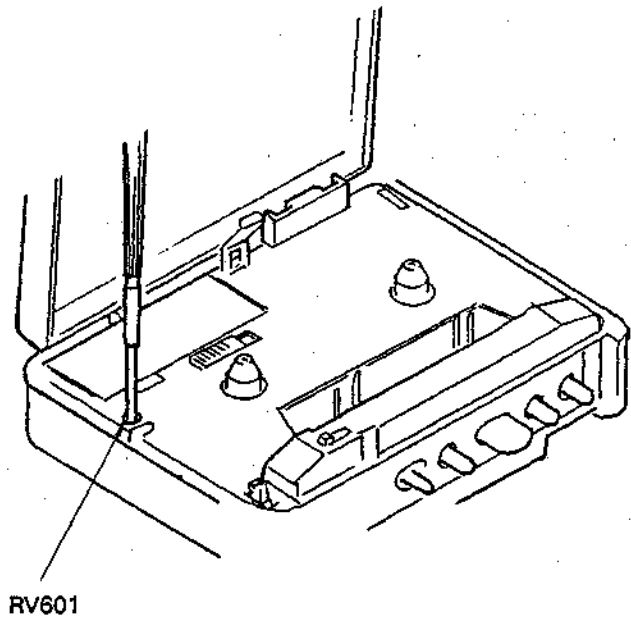


Specification :

speed checker	digital frequency counter
$\pm 1\%$	2.970 — 3.030Hz

Frequency difference between the beginning and the end of the tape should be within $\pm 2.5\%$ ($\pm 75\text{Hz}$).

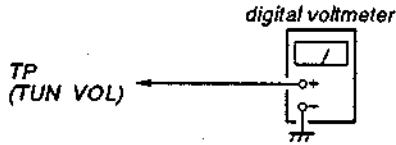
Tape Speed Adjustment :



Radio Section

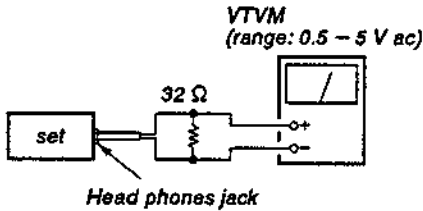
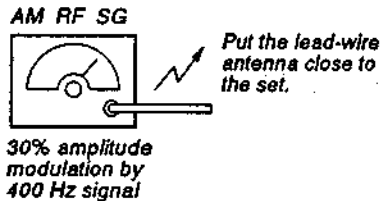
AM SECTION

BAND switch: AM



AM TUNING VOLTAGE ADJUSTMENT	
Adjust for following values on digital voltmeter	
Display indication	AM 530kHz
Digital voltmeter reading	0.80 ± 0.02V
Adjustment part	L5

AM Tracking Adjustment



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

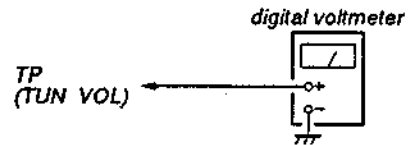
AM TRACKING ADJUSTMENT		
Adjust for a maximum reading on VTVM.		
Display indication	AM 620kHz	AM 1,400kHz
SG frequency	620kHz	1,400kHz
Adjustment part	L1	CT1

AM IF ALIGNMENT	
Adjust for a maximum reading on VTVM.	
SG frequency	1,710kHz
Adjustment parts	T1

FM SECTION

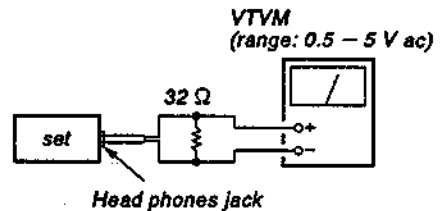
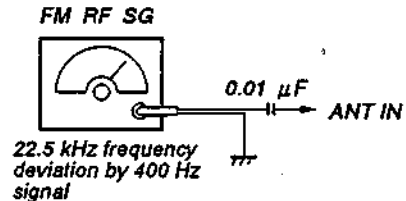
FM Tuning Voltage Adjustment

BAND switch: FM



FM TUNING VOLTAGE ADJUSTMENT	
Adjust for following values on digital voltmeter	
Display indication	FM 87.5MHz
Digital voltmeter reading	3.20 ± 0.02V
Adjustment part	L4

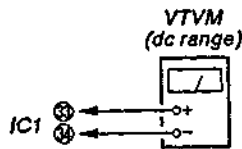
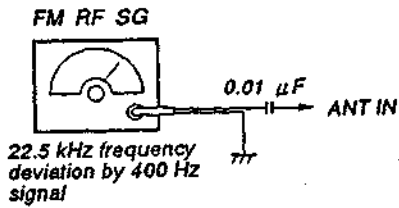
FM Tracking Adjustment



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

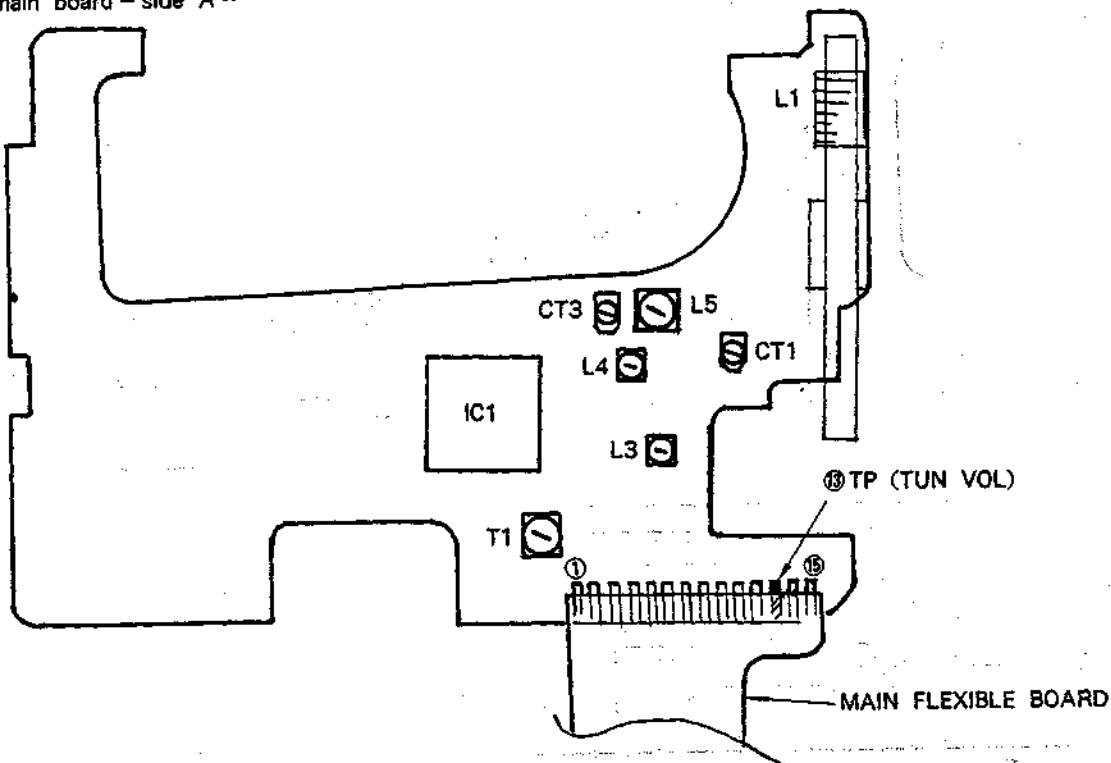
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
Display indication	FM 87.5MHz
SG frequency	87.5MHz
Adjustment part	L3

NULL Adjustment
BAND switch: FM



NULL ADJUSTMENT	
Adjust for 0V reading on VTVM.	
Display indication	FM 87.5MHz
SG frequency	87.5MHz
Adjustment part	CT3

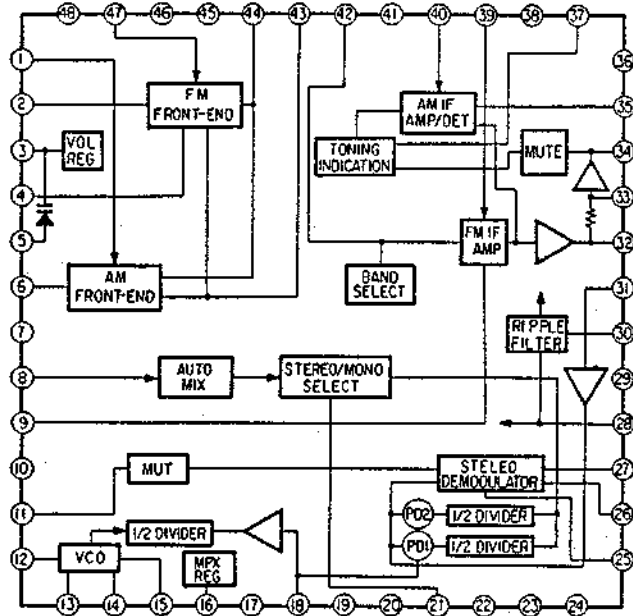
Adjustment Location :
main board - side A -



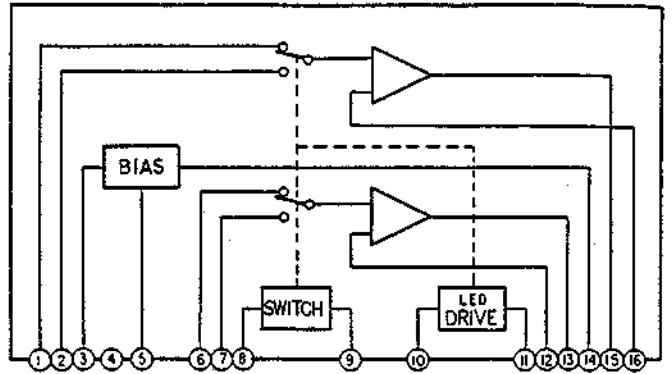
SECTION 5 DIAGRAMS

5-1. IC BLOCK DIAGRAM

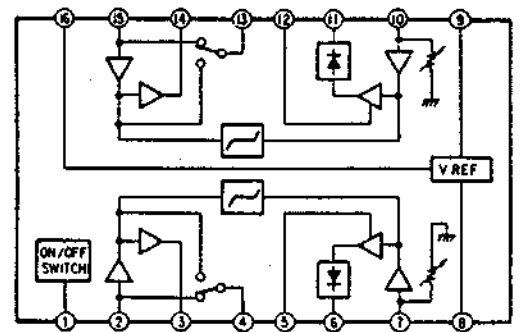
• IC1 CX20029



• IC301 BA3404F

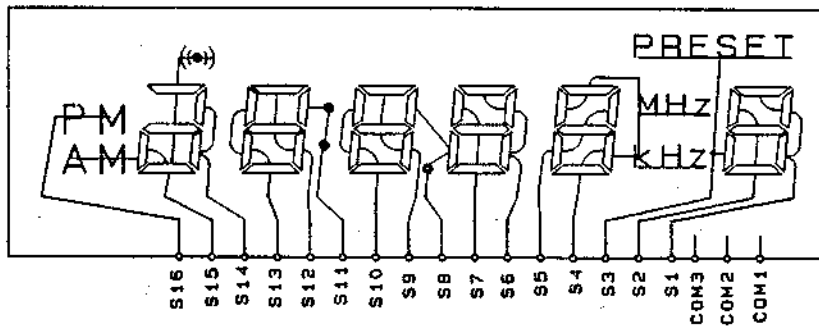


• IC302 NJM-2063AM

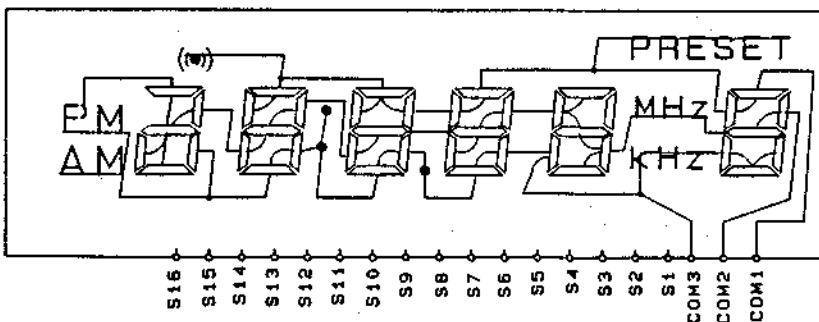


• LCD1

- SEGMENT -



- COMMON -



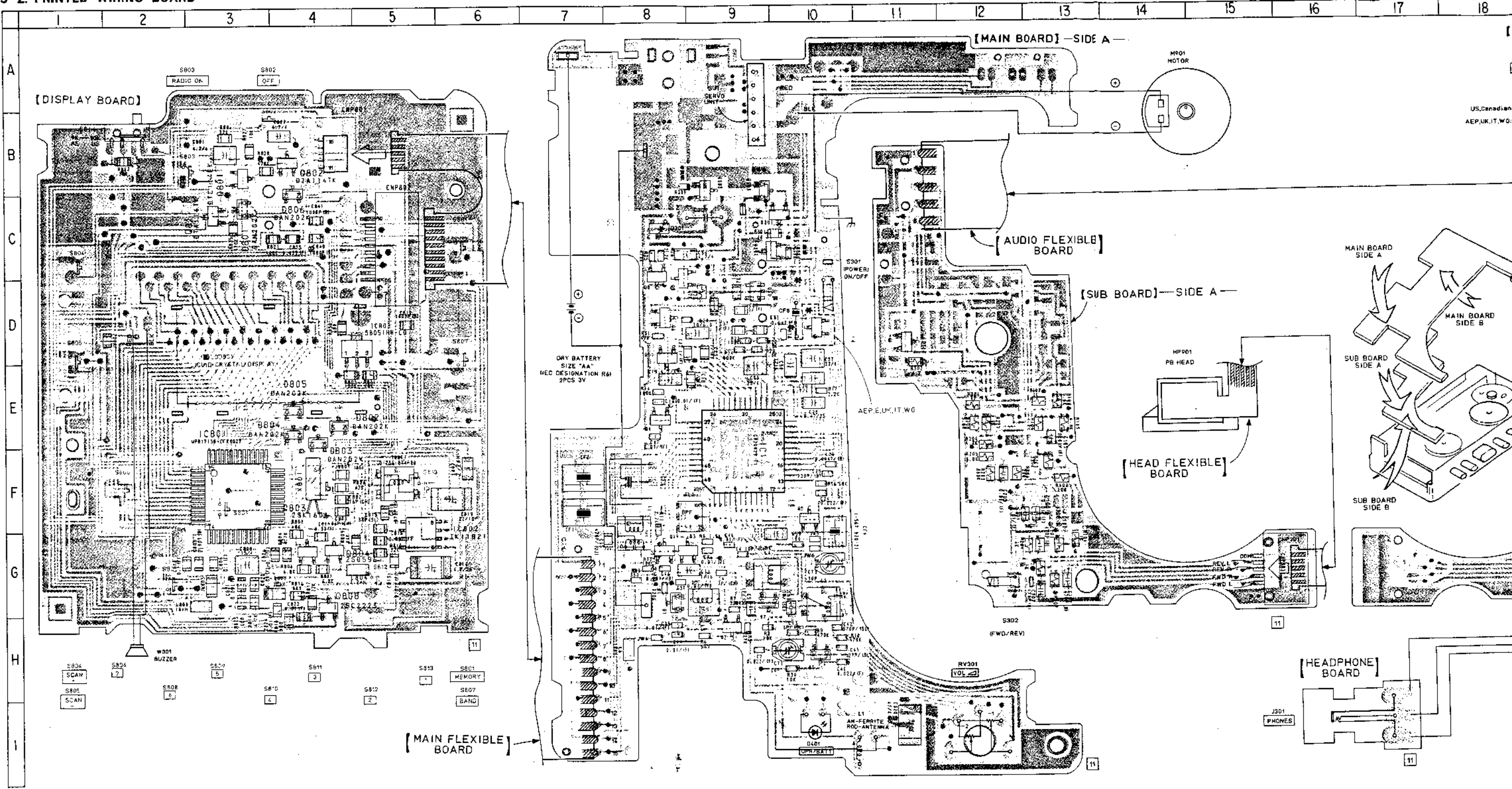
• IC303 LA4533



5-2. PRINTED WIRING BOARD

Component Location

f. No.	Location
Q1	G-8
Q2	G-9
Q3	H-10
Q4	G-24
Q301	C-8
Q303	C-9
Q401	I-10
Q801	C-3
Q802	E-4
Q803	F-4
Q804	E-4
Q805	E-4
Q806	C-4
C1	F-9
C301	G-19
C302	E-20
C303	E-23
C801	F-3
C802	G-5
C803	D-5
Q1	G-8
Q2	H-9
Q3	G-8
Q4	E-8
Q5	F-10
Q6	D-8
Q7	D-10
Q8	D-8
Q9	D-8
Q10	D-9
Q11	D-8
Q101	E-19
Q201	F-20
Q301	C-10
Q302	C-9
Q303	C-9
Q304	D-11
Q801	B-3
Q802	B-4
Q803	G-4
Q804	G-4
Q808	C-4
Q811	C-3



US, Canadian:
AEP, UK, IT, WG.

Note on Mounting Diagram:
 • ● : Through hole.
 • [Pattern] : Pattern on the side which is seen.
 • [Pattern] : Pattern of the rear side.

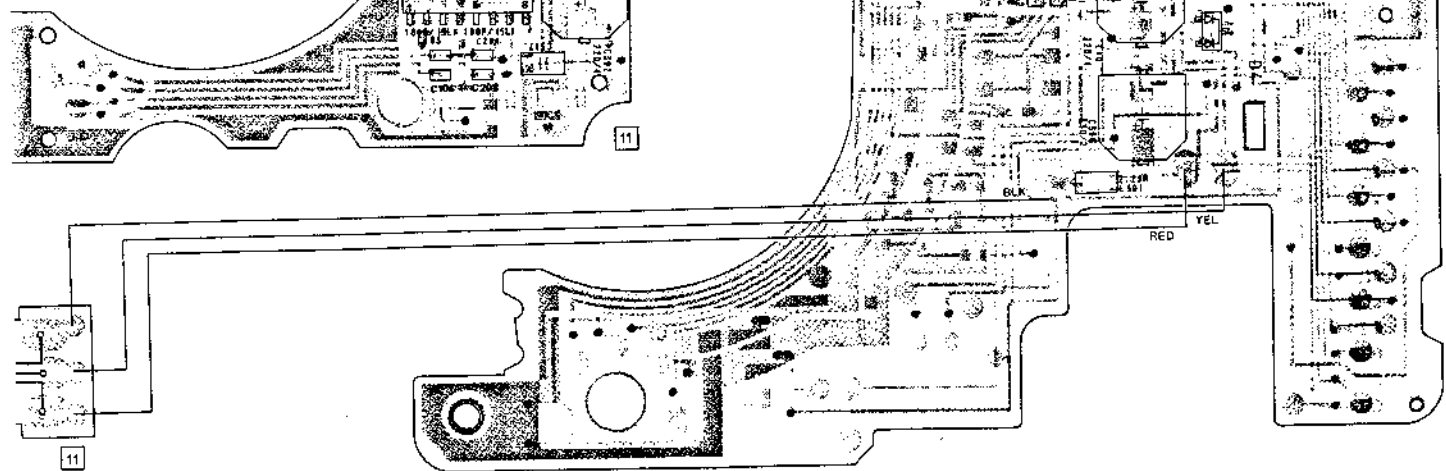
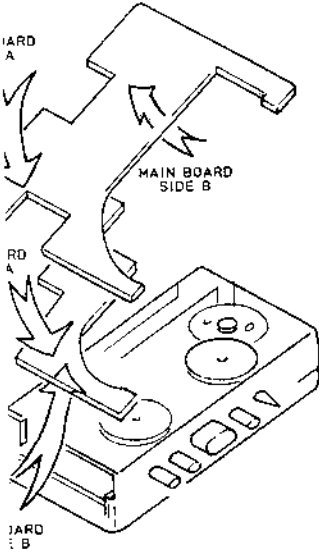
[MAIN BOARD] — SIDE B —

S304-1
 DOLBY NR
 OFF → ON

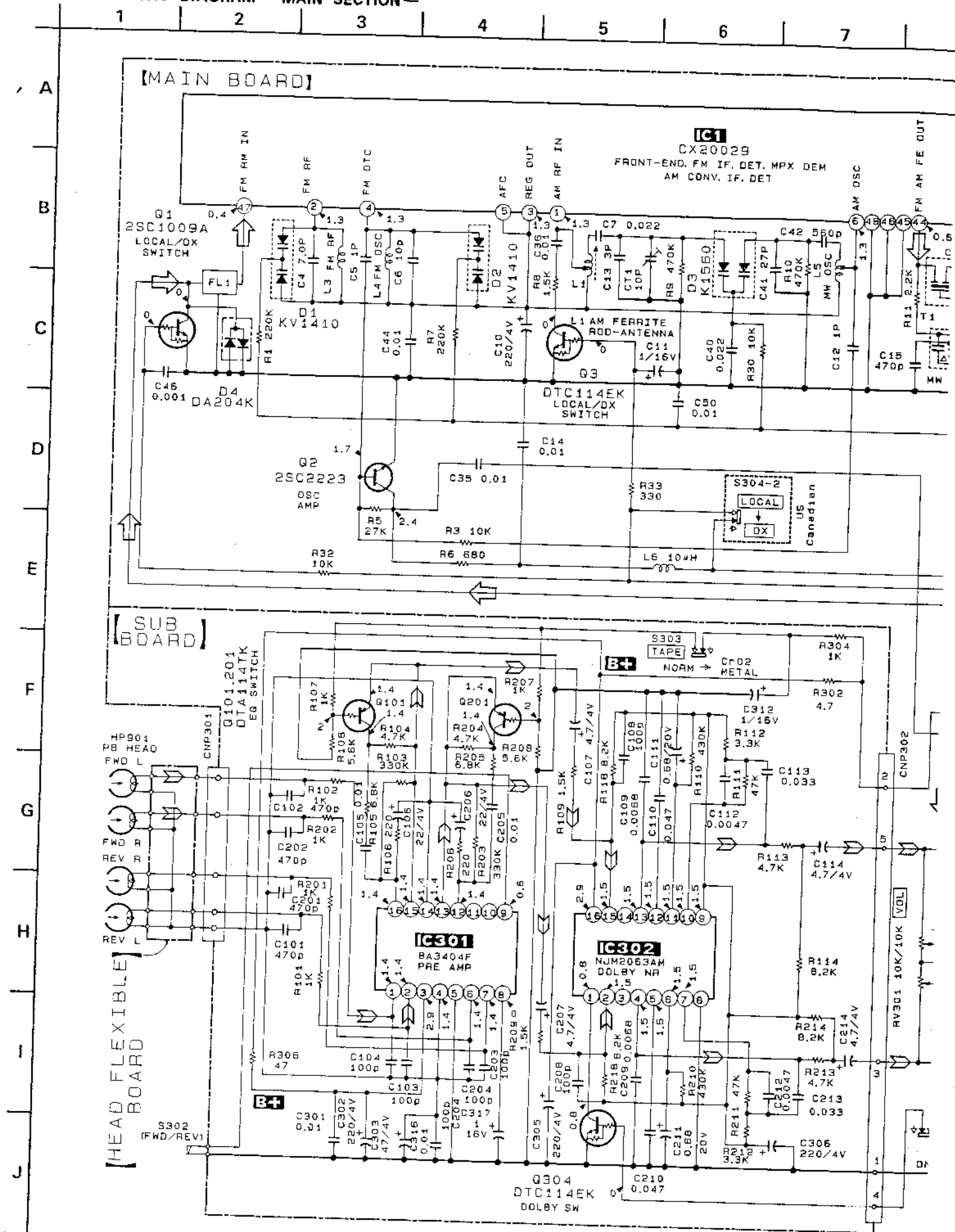
S304-2
 US, Canadian: LOCAL → BX
 AEP, UK, IT, WG: MONO → ST

[SUB BOARD] — SIDE B —

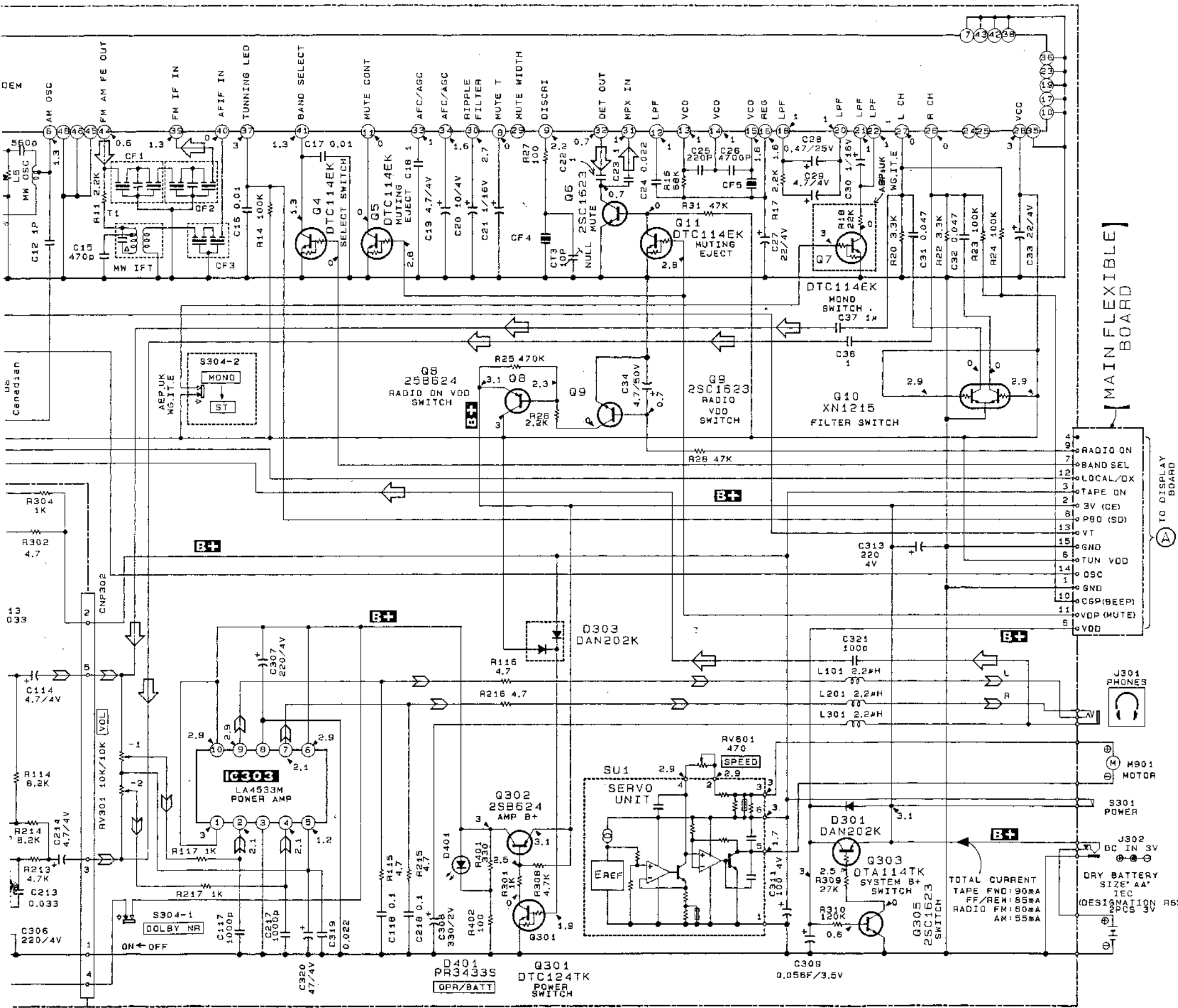
S303
 TAPE
 C-02
 METAL
 NORM



5-3. SCHEMATIC DIAGRAM — MAIN SECTION —

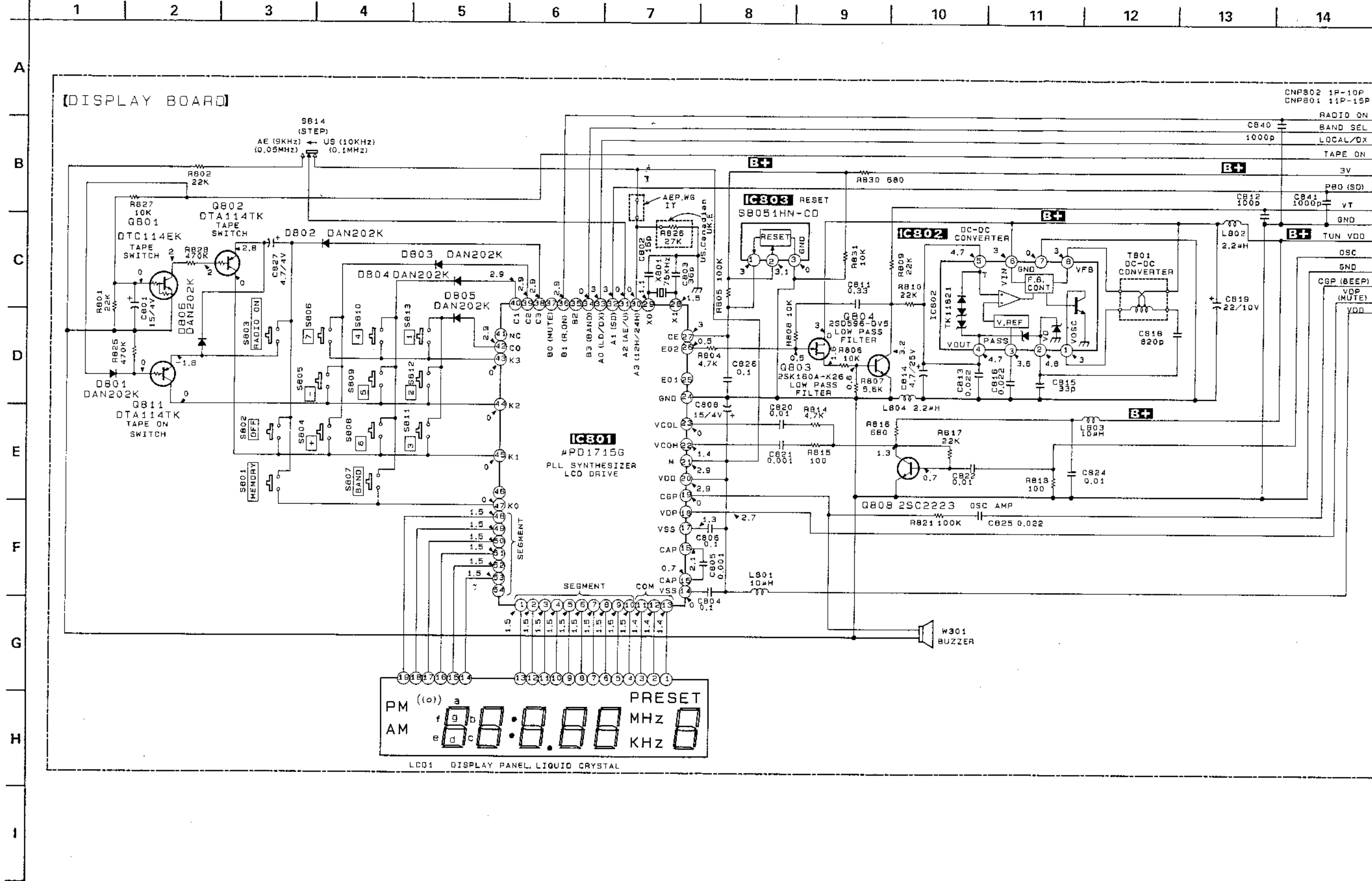


7 8 9 10 11 12 13 14 15 16 17 18 19



- Note on Schematic Diagram:**
- All capacitors are in μF unless otherwise noted, pF : μpF 50VV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 - Δ : internal component.
 - **B+**: B+ Line
 - **B-**: B- Line
 - \square : 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 (detuned) conditions. no mark: FWD, FM
 - Voltages are taken with a VOM (Input impedance 10M Ω) Voltage variations may be noted due to normal production tolerances.
 - Signal path. \Rightarrow : FM \Rightarrow : PB
- WG: West Germany Model
IT: Italian Model

5-4. SCHEMATIC DIAGRAM — DISPLAY SECTION —



SECTION 6 EXPLODED VIEWS

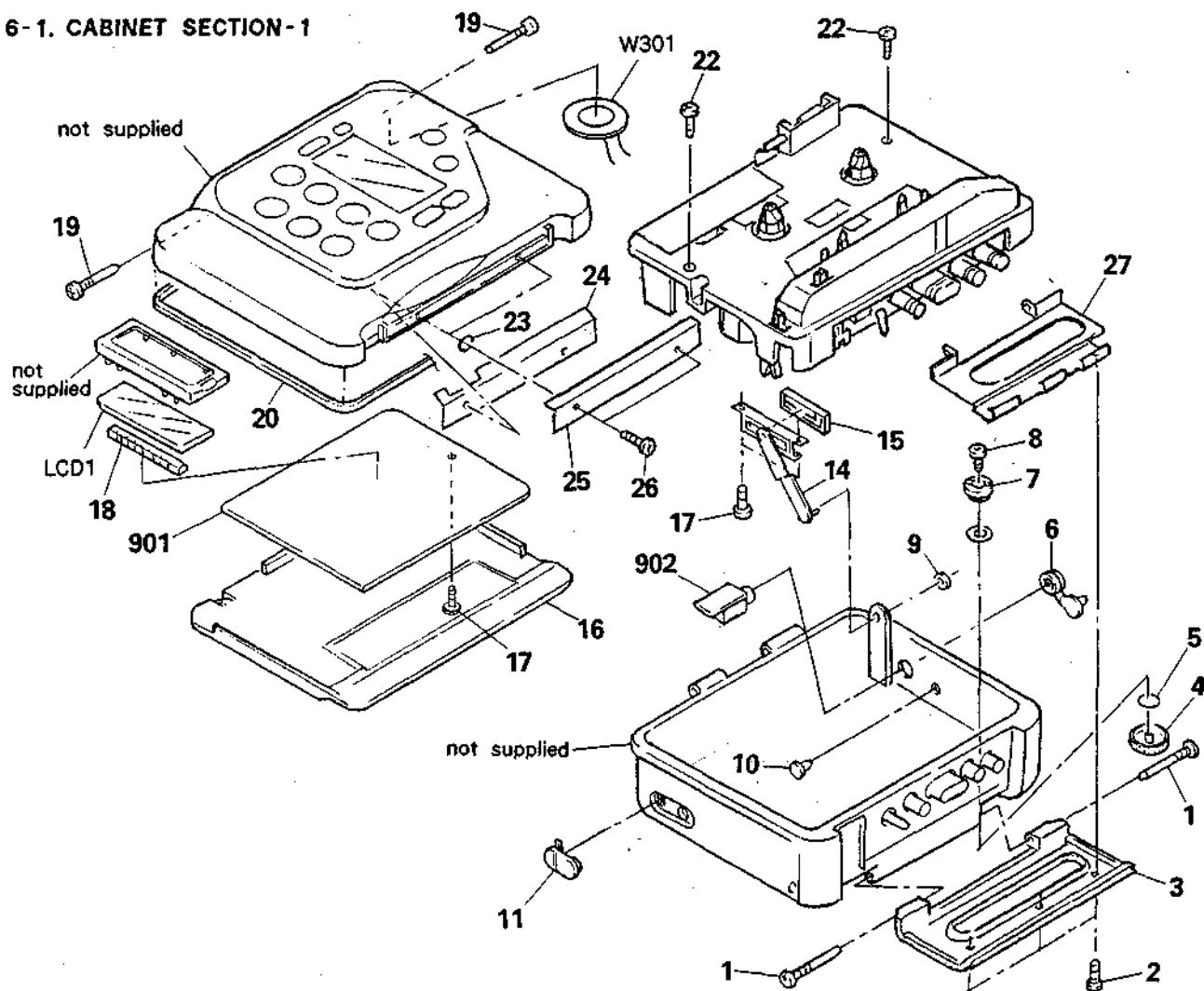
NOTE:

- 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

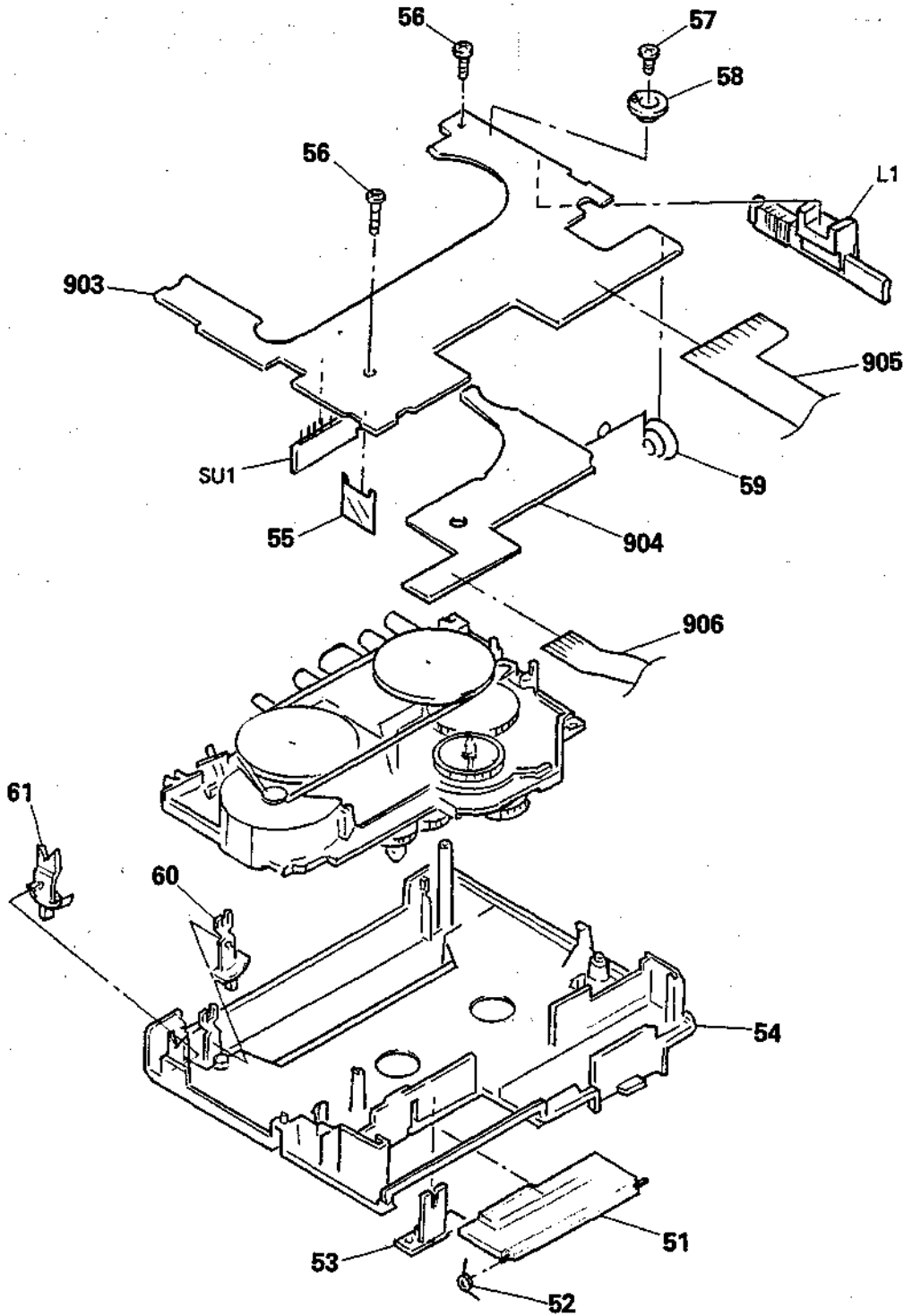
WG: West Germany Model
IT: Italian Model

6-1. CABINET SECTION-1



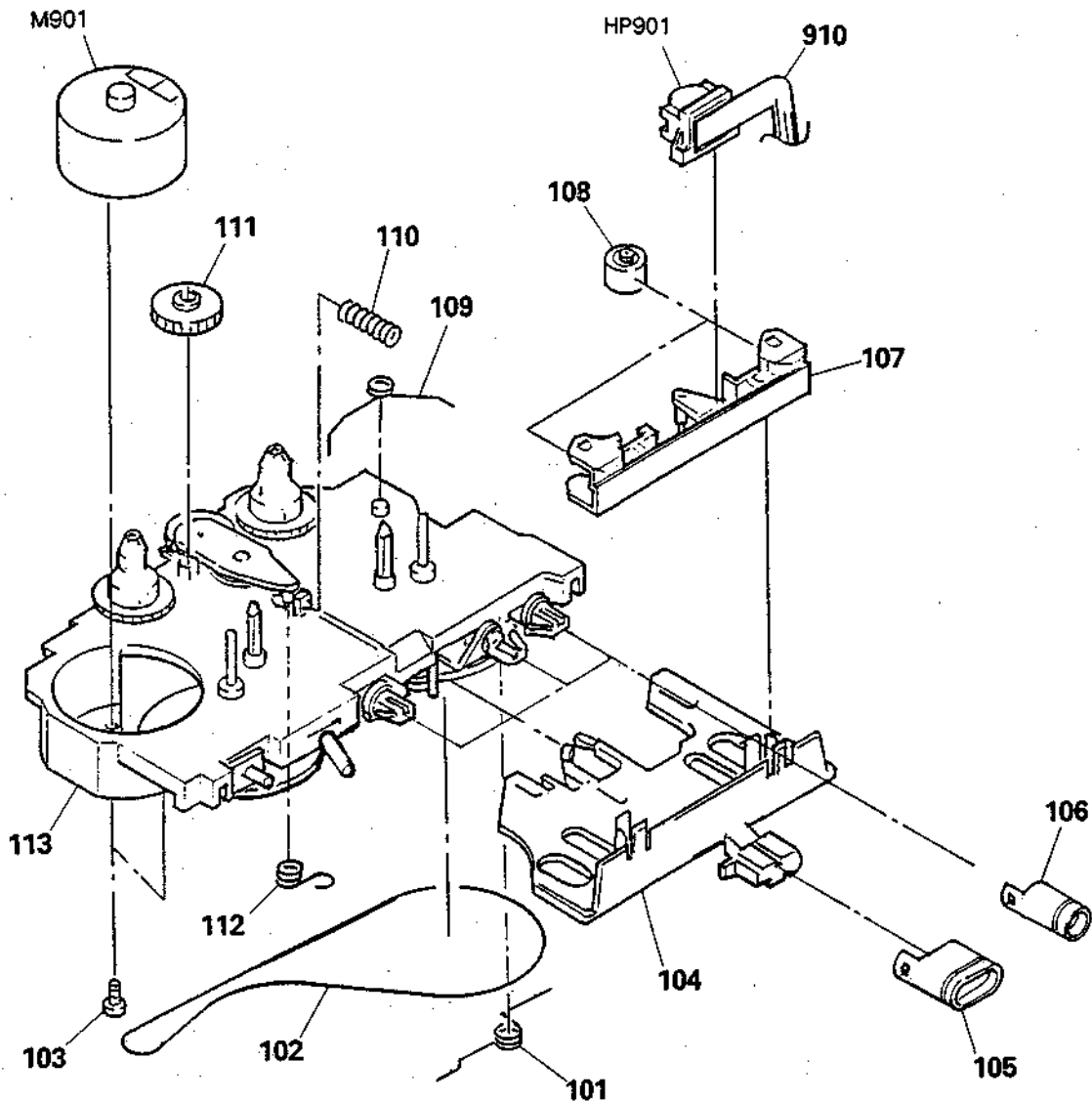
No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	3-326-536-11	SCREW, TAPPING		17	3-318-382-11	SCREW (1.7X4.5), TAPPING	
2	3-704-243-11	SCREW (P1.7X2.0)		18	1-535-749-11	CONDUCTOR (CONNECTION)	
3	3-357-488-01	BUCKLE		19	3-357-460-01	SCREW, TAPPING	
4	3-357-466-01	KNOB (A)		20	3-351-134-01	PACKING, CABINET	
5	3-326-573-01	RING (DIA.4.9X DIA.7.1), 0		22	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
6	3-326-520-01	PACKING, HP JACK		23	3-326-149-01	PACKING (B)	
7	3-357-469-01	JOINT (B)		24	3-357-472-01	REINFORCEMENT (B)	
8	3-318-201-51	SCREW (B) (1.4X4), TAPPING		25	3-357-471-01	REINFORCEMENT (A)	
9	3-578-242-11	WASHER		26	3-326-145-11	SCREW (M1.7X5.8)	
10	3-326-519-01	WINDOW, LED		27	3-357-484-01	BRACKET (BUCKLE)	
11	3-312-826-00	PACKING, DC JACK		901	A-3289-743-A	(US,Canadian,E,UK)...PC BOARD ASSY, DISPLAY	
14	X-3347-198-1	ARM ASSY, CLICK			A-3289-789-A	(AEP,WG,IT).....PC BOARD ASSY, DISPLAY	
15	3-357-486-01	SPRING, CLICK		902	*1-634-131-11	PC BOARD, HEADPHONE	
16	3-357-487-01	(US,Canadian,E,UK)...COVER		LCD1	1-808-971-11	DISPLAY PANEL, LIQUID CRYSTAL	
	3-357-487-11	(AEP,WG,IT).....COVER		W301	1-529-084-11	BUZZER	

6-2. CABINET SECTION-2



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	3-357-477-01	LID, BATTERY CASE		59	3-357-483-01	SPRING, BATTERY COIL	
52	3-357-464-01	SPRING, TORSION		60	3-357-479-01	JOINT (C)	
53	3-357-467-01	KNOB (B)		61	3-357-478-01	KNOB (C)	
54	3-357-491-01	(US,Canadian).....CHASSIS		903	A-3261-120-A	(US,Canadian).....PC BOARD ASSY, MAIN	
	3-357-491-11	(WG,IT,UK,E,AEP)...CHASSIS			A-3261-190-A	(AEP,UK,WG,IT,E)...PC BOARD ASSY, MAIN	
55	3-357-470-01	TERMINAL BOARD, BATTERY		904	A-3289-744-A	PC BOARD ASSY, SUB	
56	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT		906	1-635-388-11	PC BOARD, FLEXIBLE (AUDIO)	
57	3-318-201-51	SCREW (B) (1.4X4), TAPPING		L1	1-402-487-11	ANTENNA, FERRITE-ROD	
58	3-357-468-01	JOINT (A)		SU1	1-466-100-11	SERVO UNIT	

6-3. MECHANISM SECTION
(MF-WMF2078-19)



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
101	3-360-021-01	SPRING (STOP), TORSION		109	3-351-710-01	SPRING (PREVENTION), TORSION	
102	3-351-599-11	BELT		110	3-360-020-01	SPRING, COMPRESSION	
103	3-352-758-01	SCREW (M1.7X1.8), TOOTHED LOCK		111	3-351-597-01	GEAR (R)	
104	3-351-733-01	LEVER, PLAY		112	3-351-706-41	SPRING (T), TORSION	
105	*3-357-481-01	BUTTON (B)		113	X-3346-795-1	CHASSIS SUB ASSY	
106	*3-357-480-01	BUTTON (A)		910	1-630-959-11	PC BOARD, FLEXIBL	
107	3-351-732-01	PINCH LEVER		HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)	
108	3-352-737-01	PINCH ROLLER		M901	1-541-648-11	MOTOR, DC	

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.
- 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 P.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

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

WG: West Germany Model

IT: Italian Model

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description		
901	A-3289-743-A	(US,Canadian,E,UK) ...PC BOARD ASSY, DISPLAY	C44	1-162-974-11	CERAMIC CHIP 0.01MF		50V
	A-3289-789-A	(AEP,WG,IT)...PC BOARD ASSY, DISPLAY	C46	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
902	*1-634-131-11	PC BOARD, HEADPHONE	C50	1-162-974-11	CERAMIC CHIP 0.01MF		50V
903	A-3261-120-A	(US,Canadian).....PC BOARD ASSY, MAIN	C101	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
	A-3261-190-A	(AEP,UK,WG,IT,E)...PC BOARD ASSY, MAIN	C102	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
904	A-3289-744-A	PC BOARD ASSY, SUB	C103	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
906	1-635-388-11	PC BOARD, FLEXIBLE (AUDIO)	C104	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
910	1-630-959-11	PC BOARD, FLEXIBL	C105	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C4	1-162-912-11	CERAMIC CHIP 7PF	C106	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C5	1-163-083-00	CERAMIC CHIP 1PF	C107	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C6	1-162-915-11	CERAMIC CHIP 10PF	C108	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C7	1-162-995-11	CERAMIC CHIP 0.022MF	C109	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C10	1-126-246-11	ELECT CHIP 220MF	C110	1-163-809-11	CERAMIC CHIP 0.047MF	5%	25V
C11	1-135-091-00	TANTAL. CHIP 1MF	C111	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C12	1-163-083-00	CERAMIC CHIP 1PF	C112	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C13	1-162-934-11	CERAMIC CHIP 3PF	C113	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C14	1-162-974-11	CERAMIC CHIP 0.01MF	C114	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C15	1-163-133-00	CERAMIC CHIP 470PF	C117	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C16	1-162-974-11	CERAMIC CHIP 0.01MF	C118	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C17	1-162-974-11	CERAMIC CHIP 0.01MF	C201	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C18	1-164-346-11	CERAMIC CHIP 1MF	C202	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C19	1-135-151-21	TANTAL. CHIP 4.7MF	C203	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C20	1-135-201-11	TANTAL. CHIP 10MF	C204	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C21	1-135-091-00	TANTAL. CHIP 1MF	C205	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C22	1-164-346-11	CERAMIC CHIP 1MF	C206	1-135-202-21	TANTAL. CHIP 22MF	20%	4V
C23	1-164-346-11	CERAMIC CHIP 1MF	C207	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C24	1-162-995-11	CERAMIC CHIP 0.022MF	C208	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C25	1-162-960-11	CERAMIC CHIP 220PF	C209	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C26	1-162-968-11	CERAMIC CHIP 0.0047MF	C210	1-163-809-11	CERAMIC CHIP 0.047MF	5%	25V
C27	1-135-202-21	TANTAL. CHIP 22MF	C211	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C28	1-135-145-11	TANTAL. CHIP 0.47MF	C212	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C29	1-135-151-21	TANTAL. CHIP 4.7MF	C213	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C30	1-135-091-00	TANTAL. CHIP 1MF	C214	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V
C31	1-163-035-00	CERAMIC CHIP 0.047MF	C217	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C32	1-163-035-00	CERAMIC CHIP 0.047MF	C218	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C33	1-135-202-21	TANTAL. CHIP 22MF	C301	1-164-232-11	CERAMIC CHIP 0.01MF		50V
C34	1-135-151-21	TANTAL. CHIP 4.7MF	C302	1-126-246-11	ELECT CHIP 220MF	20%	4V
C35	1-162-974-11	CERAMIC CHIP 0.01MF	C303	1-135-163-21	TANTAL. CHIP 47MF	20%	4V
C36	1-162-974-11	CERAMIC CHIP 0.01MF	C305	1-126-246-11	ELECT CHIP 220MF	20%	4V
C37	1-164-346-11	CERAMIC CHIP 1MF	C306	1-126-246-11	ELECT CHIP 220MF	20%	4V
C38	1-164-346-11	CERAMIC CHIP 1MF	C307	1-126-246-11	ELECT CHIP 220MF	20%	4V
C40	1-162-995-11	CERAMIC CHIP 0.022MF	C308	1-126-608-11	ELECT 330MF	20%	2V
C41	1-162-946-11	CERAMIC CHIP 27PF	C309	1-125-639-11	DOUBLE LAYERS 0.056F		3.5V
C42	1-164-363-11	CERAMIC CHIP 5600PF	C311	1-126-209-11	ELECT CHIP 100MF	20%	4V
			C312	1-135-091-00	TANTAL. CHIP 1MF	20%	16V

Ref.No.	Part No.	Description			
C313	1-126-246-11	ELECT CHIP 220MF	20%	4V	
C316	1-164-232-11	CERAMIC CHIP 0.01MF		50V	
C317	1-135-091-00	TANTAL. CHIP 1MF	20%	16V	
C319	1-163-033-00	CERAMIC CHIP 0.022MF		50V	
C320	1-135-163-21	TANTAL. CHIP 47MF	20%	4V	
C321	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	
C801	1-135-158-21	TANTAL. CHIP 15MF	10%	4V	
C802	1-163-098-00	CERAMIC CHIP 16PF	5%	50V	
C803	1-163-106-00	CERAMIC CHIP 36PF	5%	50V	
C804	1-163-038-00	CERAMIC CHIP 0.1MF		25V	
C805	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C806	1-163-038-00	CERAMIC CHIP 0.1MF		25V	
C808	1-135-158-21	TANTAL. CHIP 15MF	10%	4V	
C811	1-164-336-11	CERAMIC CHIP 0.33MF		25V	
C812	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C813	1-163-033-00	CERAMIC CHIP 0.022MF		50V	
C814	1-135-085-21	TANTAL. CHIP 4.7MF	20%	25V	
C815	1-163-105-00	CERAMIC CHIP 33PF	5%	50V	
C816	1-163-033-00	CERAMIC CHIP 0.022MF		50V	
C818	1-163-139-00	CERAMIC CHIP 820PF	10%	50V	
C819	1-135-161-21	TANTAL. CHIP 22MF	10%	10V	
C820	1-164-232-11	CERAMIC CHIP 0.01MF		50V	
C821	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C822	1-164-232-11	CERAMIC CHIP 0.01MF		50V	
C824	1-164-232-11	CERAMIC CHIP 0.01MF		50V	
C825	1-163-033-00	CERAMIC CHIP 0.022MF		50V	
C826	1-163-038-00	CERAMIC CHIP 0.1MF		25V	
C827	1-135-151-21	TANTAL. CHIP 4.7MF	20%	4V	
C840	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C841	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
CF1	1-567-910-11	FILTER, CERAMIC			
CF2	1-567-910-11	FILTER, CERAMIC			
CF3	1-577-261-21	FILTER, CERAMIC			
CF4	1-577-065-11	FILTER, CERAMIC			
CF5	1-567-164-00	VIBRATOR, CERAMIC			
CNP301	1-565-370-11	HOUSING, CONNECTOR 5P			
CNP302	1-565-370-11	HOUSING, CONNECTOR 5P			
CNP801	*1-565-370-11	HOUSING, CONNECTOR 5P			
CNP802	*1-569-470-21	HOUSING, CONNECTOR 10P			
CT1	1-141-373-11	CAP, TRIMMER			
CT3	1-141-373-11	CAP, TRIMMER			
D1	8-719-984-03	DIODE KV1410			
D2	8-719-984-03	DIODE KV1410			
D3	8-719-951-05	DIODE KV1560			

Ref.No.	Part No.	Description				
D4	8-719-800-76	DIODE 1SS226				
D301	8-719-400-18	DIODE MA152WK				
D303	8-719-400-18	DIODE MA152WK				
D401	8-719-976-04	DIODE PR3433S				
D801	8-719-400-18	DIODE MA152WK				
D802	8-719-400-18	DIODE MA152WK				
D803	8-719-400-18	DIODE MA152WK				
D804	8-719-400-18	DIODE MA152WK				
D805	8-719-400-18	DIODE MA152WK				
D806	8-719-400-18	DIODE MA152WK				
FL1	1-236-053-11	FILTER, BAND PASS				
HP901	1-543-596-11	HEAD, MAGNETIC (PLAYBACK)				
IC1	8-752-039-99	IC CX20029				
IC301	8-759-909-64	IC BA3404F				
IC302	8-759-701-07	IC NJM2063AM				
IC303	8-759-802-75	IC LA4533M				
IC801	8-759-149-11	IC UPD1715G-621-22				
IC802	8-759-999-91	IC TK11821M				
IC803	8-759-947-95	IC S-8051HN-CDS				
J301	1-565-376-11	JACK, HEADPHONE				
J302	1-569-412-11	JACK, EXTERNAL POWER				
JW3	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW4	1-216-864-11	METAL GLAZE	0	5%	1/16W	
JW5	1-216-864-11	METAL GLAZE	0	5%	1/16W	
JW6	1-216-864-11	METAL GLAZE	0	5%	1/16W	
JW301	1-216-296-00	METAL GLAZE	0	5%	1/8W	
JW302	1-216-296-00	METAL GLAZE	0	5%	1/8W	
JW801	1-216-295-00	(AEP, IT, WG)...METAL GLAZE	0	5%	1/10W	
JW802	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW803	1-216-296-00	METAL GLAZE	0	5%	1/10W	
L1	1-402-487-11	ANTENNA, FERRITE-ROD				
L3	1-426-509-41	COIL (FM RF)				
L4	1-406-392-11	COIL (FM OSC)				
L5	1-406-177-61	COIL				
L6	1-410-204-31	INDUCTOR CHIP 10UH				
L101	1-410-196-11	INDUCTOR CHIP 2.2UH				
L201	1-410-196-11	INDUCTOR CHIP 2.2UH				
L301	1-410-196-11	INDUCTOR CHIP 2.2UH				
L801	1-410-204-31	INDUCTOR CHIP 10UH				
L802	1-410-196-11	INDUCTOR CHIP 2.2UH				
L803	1-410-204-31	INDUCTOR CHIP 10UH				
L804	1-410-196-11	INDUCTOR CHIP 2.2UH				
LCD1	1-808-971-11	DISPLAY PANEL, LIQUID CRYSTAL				
M901	1-541-648-11	MOTOR, DC				

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
Q1	8-729-101-25	TRANSISTOR 2SC1009A-FA4	R28	1-216-089-00	METAL GLAZE 47K 5% 1/10W
Q2	8-729-102-08	TRANSISTOR 2SC2223-F14	R30	1-216-833-11	METAL GLAZE 10K 5% 1/16W
Q3	8-729-900-53	TRANSISTOR DTC114EK	R31	1-216-841-11	METAL GLAZE 47K 5% 1/16W
Q4	8-729-900-53	TRANSISTOR DTC114EK	R32	1-216-833-11	METAL GLAZE 10K 5% 1/16W
Q5	8-729-900-53	TRANSISTOR DTC114EK	R33	1-216-839-11	METAL GLAZE 330 1/16W
Q6	8-729-100-66	TRANSISTOR 2SC1623-L6	R101	1-216-049-00	METAL GLAZE 1K 5% 1/10W
Q7	8-729-900-53	(WG,IT,AEP,E,UK)...TRANSISTOR DTC114EK	R102	1-216-049-00	METAL GLAZE 1K 5% 1/10W
Q8	8-729-162-44	TRANSISTOR 2SB624-BV4	R103	1-216-109-00	METAL GLAZE 330K 5% 1/10W
Q9	8-729-100-66	TRANSISTOR 2SC1623-L6	R104	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
Q10	8-729-403-17	TRANSISTOR XN1215	R105	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W
Q11	8-729-900-53	TRANSISTOR DTC114EK	R106	1-216-635-11	METAL CHIP 220 0.50% 1/10W
Q101	8-729-900-51	TRANSISTOR DTA114TK	R107	1-216-049-00	METAL GLAZE 1K 5% 1/10W
Q201	8-729-900-51	TRANSISTOR DTA114TK	R108	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
Q301	8-729-920-06	TRANSISTOR DTC124TK-T-146	R109	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W
Q302	8-729-162-44	TRANSISTOR 2SB624-BV4	R110	1-216-112-00	METAL GLAZE 430K 5% 1/10W
Q303	8-729-900-51	TRANSISTOR DTA114TK	R111	1-216-691-11	METAL CHIP 47K 0.50% 1/10W
Q304	8-729-900-53	TRANSISTOR DTC114EK	R112	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W
Q305	8-729-100-66	TRANSISTOR 2SC1623-L6	R113	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W
Q801	8-729-900-53	TRANSISTOR DTC114EK	R114	1-216-673-11	METAL CHIP 8.2K 0.50% 1/10W
Q802	8-729-900-51	TRANSISTOR DTA114TK	R115	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
Q803	8-729-117-84	TRANSISTOR 2SK160AK26	R116	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
Q804	8-729-159-64	TRANSISTOR 2SD596	R117	1-216-198-00	METAL GLAZE 1K 5% 1/8W
Q808	8-729-102-08	TRANSISTOR 2SC2223F14	R118	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W
Q811	8-729-900-51	TRANSISTOR DTA114TK	R201	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R1	1-216-849-11	METAL GLAZE 220K 5% 1/16W	R202	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R3	1-216-833-11	METAL GLAZE 10K 5% 1/16W	R203	1-216-109-00	METAL GLAZE 330K 5% 1/10W
R5	1-216-838-11	METAL GLAZE 27K 5% 1/16W	R204	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R6	1-216-819-11	METAL GLAZE 680 5% 1/16W	R205	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W
R7	1-216-849-11	METAL GLAZE 220K 5% 1/16W	R206	1-216-635-11	METAL CHIP 220 0.50% 1/10W
R8	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	R207	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R9	1-216-853-11	METAL GLAZE 470K 5% 1/16W	R208	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
R10	1-216-853-11	METAL GLAZE 470K 5% 1/16W	R209	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W
R11	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	R210	1-216-112-00	METAL GLAZE 430K 5% 1/10W
R14	1-216-845-11	METAL GLAZE 100K 5% 1/16W	R211	1-216-691-11	METAL CHIP 47K 0.50% 1/10W
R16	1-216-843-11	METAL GLAZE 68K 5% 1/16W	R212	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W
R17	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	R213	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W
R18	1-216-837-11	(WG,IT,E,AEP,UK) ...METAL GLAZE 22K 5% 1/16W	R214	1-216-673-11	METAL CHIP 8.2K 0.50% 1/10W
R20	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	R215	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R22	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	R216	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R23	1-216-845-11	METAL GLAZE 100K 5% 1/16W	R217	1-216-198-00	METAL GLAZE 1K 5% 1/8W
R24	1-216-845-11	METAL GLAZE 100K 5% 1/16W	R218	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W
R25	1-216-853-11	METAL GLAZE 470K 5% 1/16W	R301	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R26	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	R302	1-216-308-00	METAL GLAZE 4.7 5% 1/10W
R27	1-216-809-11	METAL GLAZE 100 5% 1/16W	R304	1-216-049-00	METAL GLAZE 1K 5% 1/10W
			R306	1-216-017-00	METAL GLAZE 47 5% 1/10W

Ref.No.	Part No.	Description
R309	1-216-838-11	METAL GLAZE 27K 5% 1/16W
R310	1-216-099-11	METAL GLAZE 120K 5% 1/16W
R401	1-216-639-11	METAL CHIP 330 0.50% 1/10W
R402	1-216-627-11	METAL CHIP 100 0.50% 1/10W
R801	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R802	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R804	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R805	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R806	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R807	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W
R808	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R809	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R810	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R814	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R815	1-216-025-00	METAL GLAZE 100 5% 1/10W
R816	1-216-045-00	METAL GLAZE 680 5% 1/10W
R817	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R818	1-216-025-00	METAL GLAZE 100 5% 1/10W
R821	1-216-097-00	METAL GLAZE 100K 5% 1/10W
R825	1-216-113-00	METAL GLAZE 470K 5% 1/10W
R826	1-216-089-00	{US,Canadian,E,UK} ...METAL GLAZE 47K 5% 1/10W
R827	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R828	1-216-113-00	METAL GLAZE 470K 5% 1/10W
R830	1-216-647-11	METAL CHIP 680 0.50% 1/10W
R831	1-216-675-11	METAL CHIP 10K 0.50% 1/10W
RV301	1-230-593-11	RES, VAR, CARBON 10K/10K (VOL)
RV601	1-238-237-11	RES, ADJ, CERMET 470 (SPEED)
S301	1-572-271-11	SWITCH, LEAF
S302	1-571-859-11	SWITCH, LEAF
S303	1-572-272-21	SWITCH, SLIDE
S304	1-571-277-11	SWITCH, SLIDE
S801	1-572-270-11	SWITCH, KEYBOARD
S802	1-572-270-11	SWITCH, KEYBOARD
S803	1-572-270-11	SWITCH, KEYBOARD
S804	1-572-270-11	SWITCH, KEYBOARD
S805	1-572-270-11	SWITCH, KEYBOARD
S806	1-572-270-11	SWITCH, KEYBOARD
S807	1-572-270-11	SWITCH, KEYBOARD
S808	1-572-270-11	SWITCH, KEYBOARD
S809	1-572-270-11	SWITCH, KEYBOARD
S810	1-572-270-11	SWITCH, KEYBOARD
S811	1-572-270-11	SWITCH, KEYBOARD
S812	1-572-270-11	SWITCH, KEYBOARD
S813	1-572-270-11	SWITCH, KEYBOARD
S814	1-571-275-11	SWITCH, SLIDE

Ref.No.	Part No.	Description
SU1	1-466-100-11	SERVO UNIT
T1	1-404-690-11	TRANSFORMER, IF
T801	1-424-351-21	TRANSFORMER, DC-DC CONVERTER
W307	1-529-084-11	BUZZER
X801	1-577-262-11	VIBRATOR, CRYSTAL (75kHz)

ACCESSORY & PACKING MATERIAL

*3-360-028-01	(US,Canadian).....INDIVIDUAL CARTON
*3-360-034-01	(UK,E,AEP,WG,IT)...INDIVIDUAL CARTON
*3-360-029-01	CUSHION (UPPER)
*3-360-030-01	CUSHION (LOWER)
3-751-661-31	(Canadian,E)...INSTRUCTION
3-751-662-11	(AEP,UK,Canadian,E,WG,IT) ...MANUAL, INSTRUCTION (ENGLISH/FRENCH)
3-751-662-21	(US).....MANUAL, INSTRUCTION (ENGLISH)
3-751-662-41	(AEP,WG)...MANUAL, INSTRUCTION (GERMAN/DUTCH)
3-751-662-51	(AEP,E,WG)...MANUAL, INSTRUCTION (SPANISH/PORTUGUESE)
3-751-662-61	(AEP,IT,WG)...MANUAL, INSTRUCTION (SWEDISH/ITALIAN)
8-952-261-90	(EXCEPT E)...HEADPHONE MOR-W15L/Y SET
8-952-265-90	(E).....HEADPHONE MOR-E215/Y SET
X-3347-197-7	CASE ASSY, CARRYING