

WM-FX671

SERVICE MANUAL

US Model
AEP Model

Ver 1.0 1999.03



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Model Name Using Similar Mechanism	WM-EX678
Tape Transport Mechanism Type	MT-WMEX672-162

SPECIFICATIONS

Radio section

Frequency range

FM : 87.5 – 108MHz
AM : 531 – 1.602 kHz

Tape section

Frequency response
(Dolby NR off)
Output

Playback: 40 – 15,000Hz
Headphones (\odot REMOTE) jack
Load impedance 8 – 300 Ω

General

Power requirements

1.5V
Rechargeable battery
One R6 (size AA) battery

Dimensions (w/h/d)

Approx. 108.9 × 77.7 × 23.9 mm
($4\frac{3}{8} \times 3\frac{1}{8} \times \frac{31}{32}$ inches), incl.
projecting parts and controls

Mass

Approx. 145 g (5.2 oz)
Approx. 210 g (7.5oz) incl.
rechargeable battery and a cassette

Supplied accessories

Battery case (1)
Stereo earphones (1)
Battery charge (1)
Rechargeable battery (NC-6WM, 1.2V, 600mAh,
Ni-Cb) (1)
Rechargeable battery carrying case (1)
Carrying pouch (1)

Design and specifications are subject to change without notice

RADIO CASSETTE PLAYER



SONY®

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SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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

SECTION 1 SERVICE NOTE

[Service Mode]

The service mode enables to operate the mechanism of WM-FX671 while the MAIN board is opened.

Rotation of the idler gear (A) (S side) is detected using the photo-reflector (PH1) in the WM-FX671. PH1 is located on the MAIN board, therefore the rotation of the idler gear (A) (S side) cannot be detected by PH1 when the MAIN board is removed. As a result, the motor cannot be controlled and cannot run correctly.

To repair the machine after the MAIN board is removed while the main power is turned on, follow the procedures as described below.

1. Setting




- 1) Remove the cabinets referring to section "3. DISASSEMBLY". Open the MAIN board.
- 2) Connect the motor (M601) and the plunger solenoid (PM901) to the MAIN board using the jumper wires. When the extension jig (1-769-143-11) (10 wires as a set) is used, they can be connected easily.
- 3) Short the TAPE DETECT switch (S901-2), R TUME switch (S901-1).
- 4) Connect an AF oscillator to resistor (R43).
- 5) Connect DC 1.3 V from external regulated power supply to ⊕ and ⊖ terminals of the battery.

2. PRE-SET status



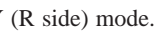
The PLAY, FF and REW modes can be entered only from the PRE-SET status.

- 1) Check that the slider (NR) is in the center position (S1), and the FWD/REV switch is also in the center position. When these switches are not in the center position, set them to the PRE-SET status as follows.
- 2) Move the FWD/REV switch (S1) to the same position as the slider (NR) is set.
- 3) The slider (NR) can be moved when the main power of the regulated power supply is turned OFF once then back ON. Move the FWD/REV switch (S1) to the center position in synchronism with the timing when the slider (NR) is moved.

3. FF, REW modes

- 1) Check that the PRE-SET status is set.
- 2) Connect square wave or sine wave to resistor (R43). (See illustration below.)
- 3) Press the  switch (S3) to enter the STOP mode.
- 4) Press the  switch (S4) and the  switch (S5).

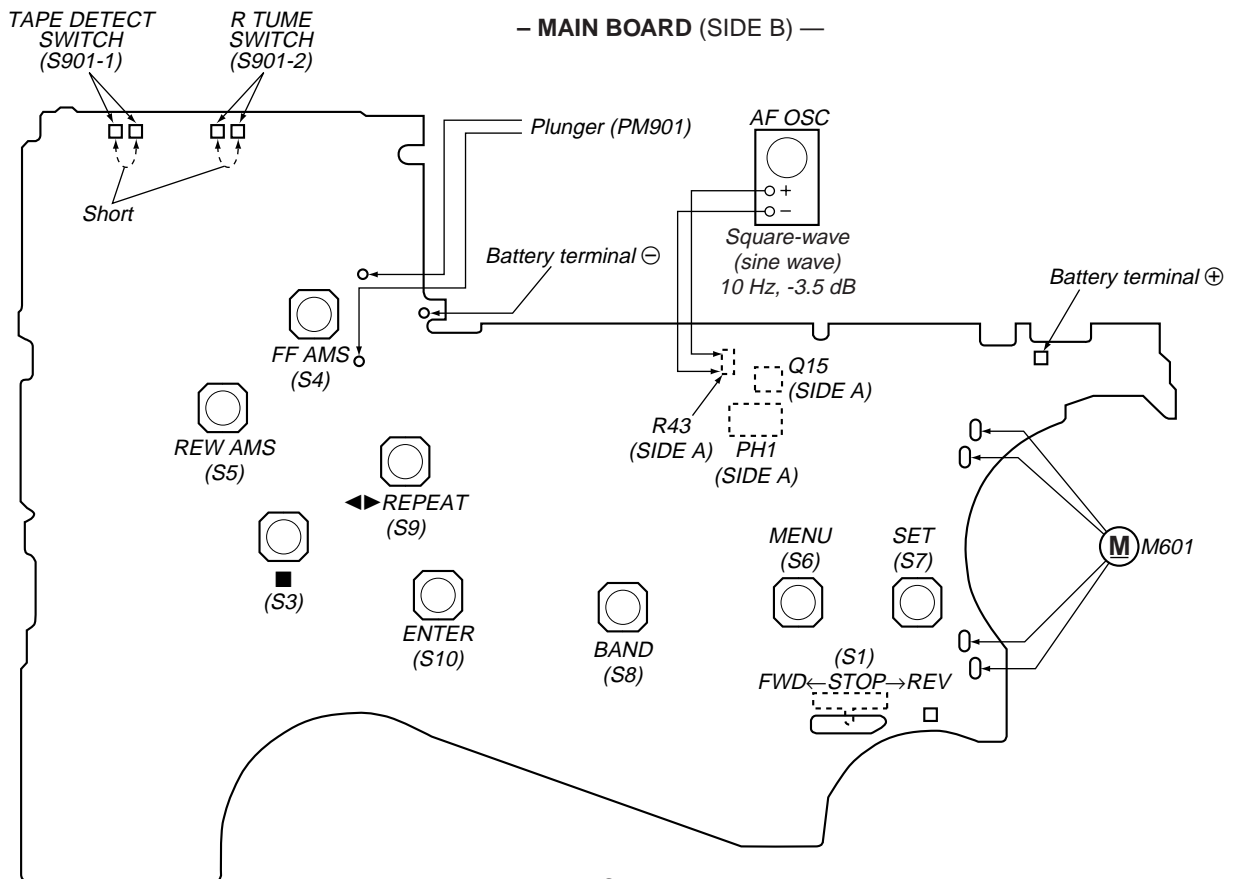
4. PLAY mode

- 1) Check that the PRE-SET status is set.
- 2) Connect square wave or sine wave to resistor (R43). (See illustration below.)
- 3) Press the  switch (S3) to enter the stop mode.
- 4) When the  switch (S9) of the MAIN board is pressed, the slider (N/R) moves once to the F side then moves to the R side. When the FWD/REV switch (S1) is pressed in the synchronism with the above timing, the machine can enter the PLAY (R side) mode. Press the  switch (S9) again, and move the FWD/REV switch (S1) in the synchronism with the motion of slider (NR). It enables the machine to enter into the PLAY (F side) mode.

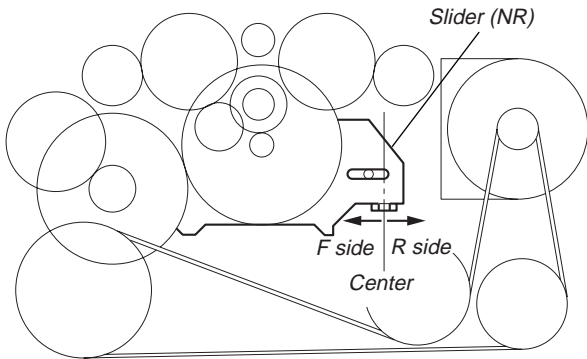
Note 1: When you fail to enter the PLAY mode, re-start from step 1) PRE-SET status.

Note 2: Regarding the  (S9),  (S3),  (S4), and  (S5) switches, use these switches of the remote control unit as much as possible.

Note 3: If a headphones are used, the beep sound shows the timing of the FWD/REV switch (S1).

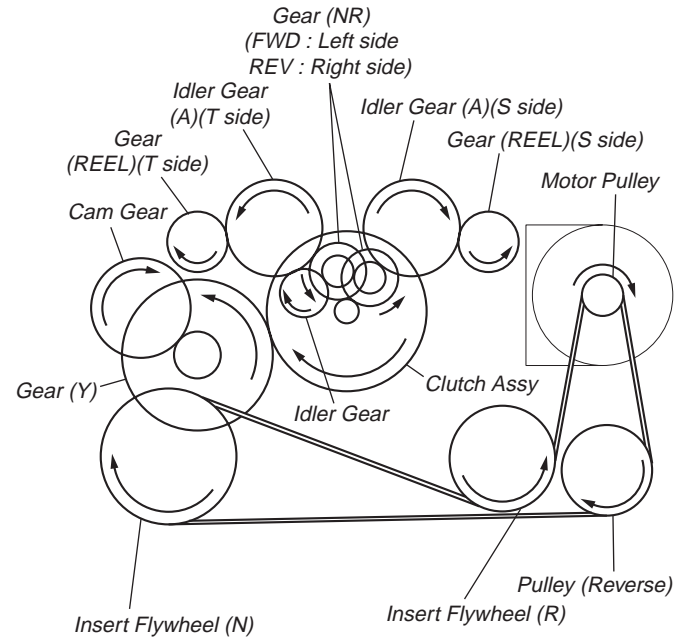


[Slider (NR)]



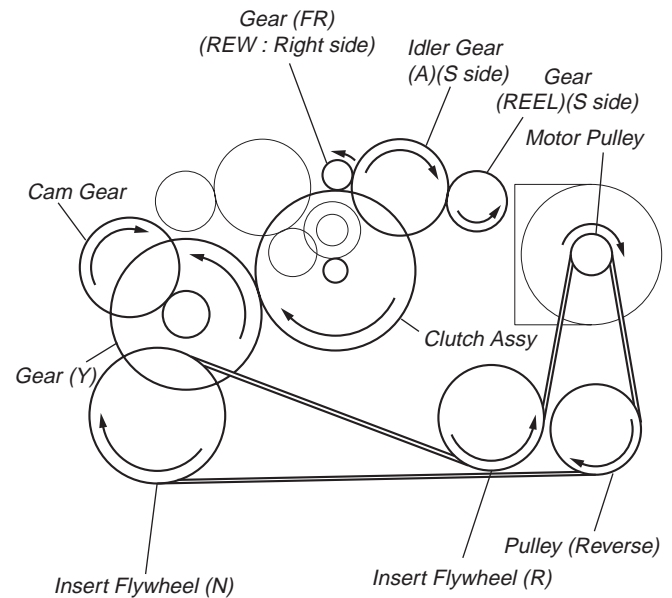
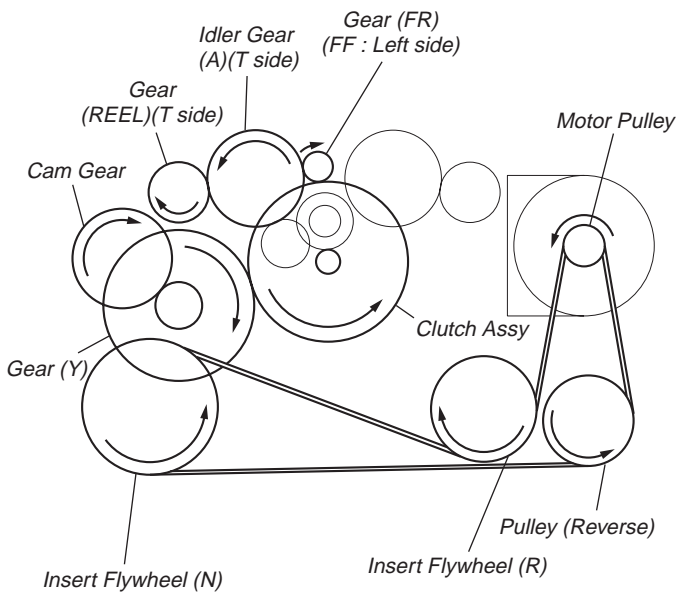
[Tape drive mechanism]

Tape drive mechanism in PLAY mode



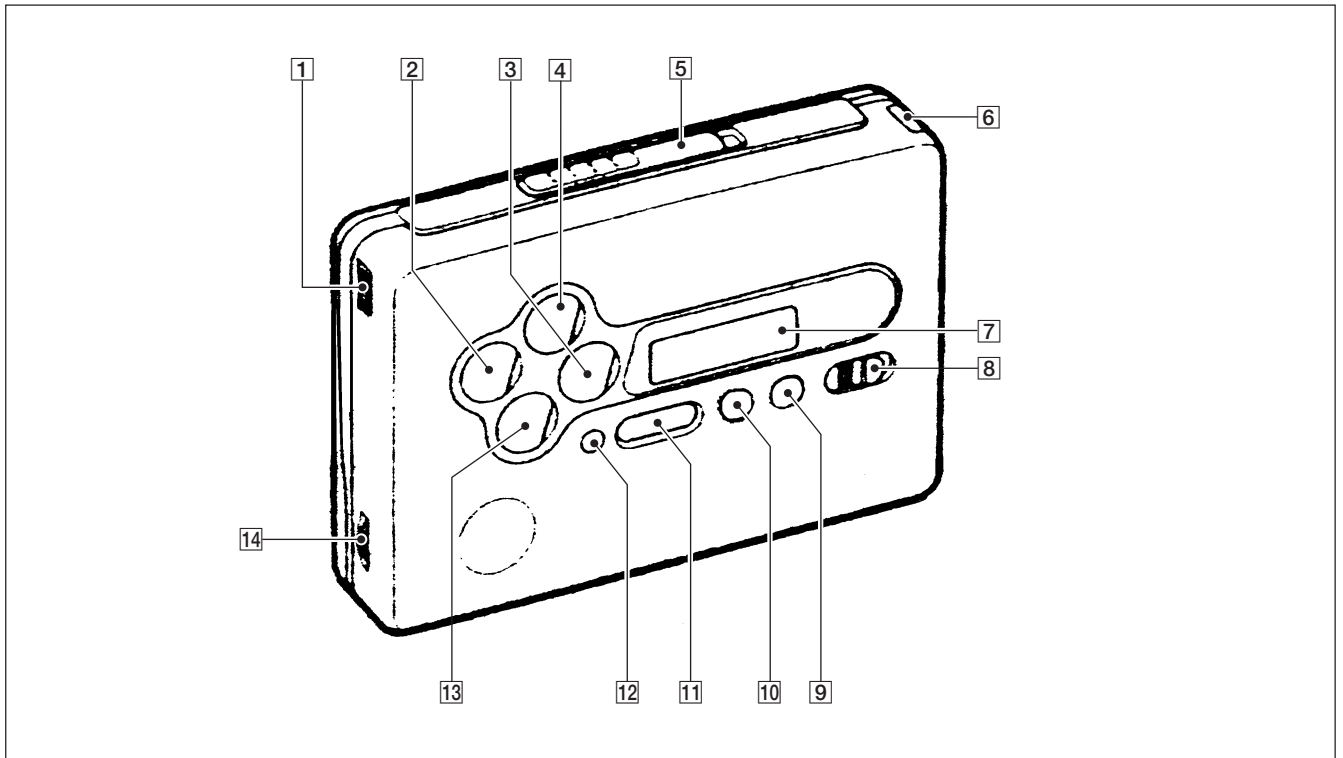
Tape drive mechanism in FF mode

Tape drive mechanism in REW mode



SECTION 2 GENERAL

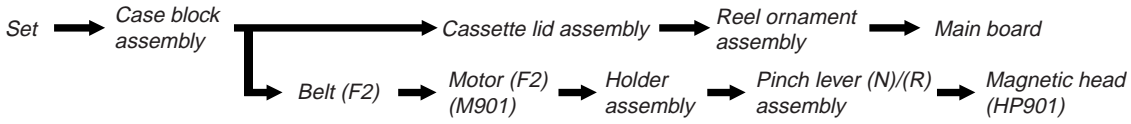
• LOCATION OF CONTROLS



- 1 Ⓞ REMOTE jack
- 2 REW, AMS button
- 3 ◀▶, REPEAT button
- 4 FF, AMS button
- 5 OPEN knob
- 6 Battery case
- 7 Display window
- 8 HOLD ➡ knob
- 9 SET button
- 10 MENU button
- 11 BAND, RADIO ON button
- 12 ENTER, COUNTER RESET button
- 13 ■, RADIO OFF button
- 14 ▲ VOL knob

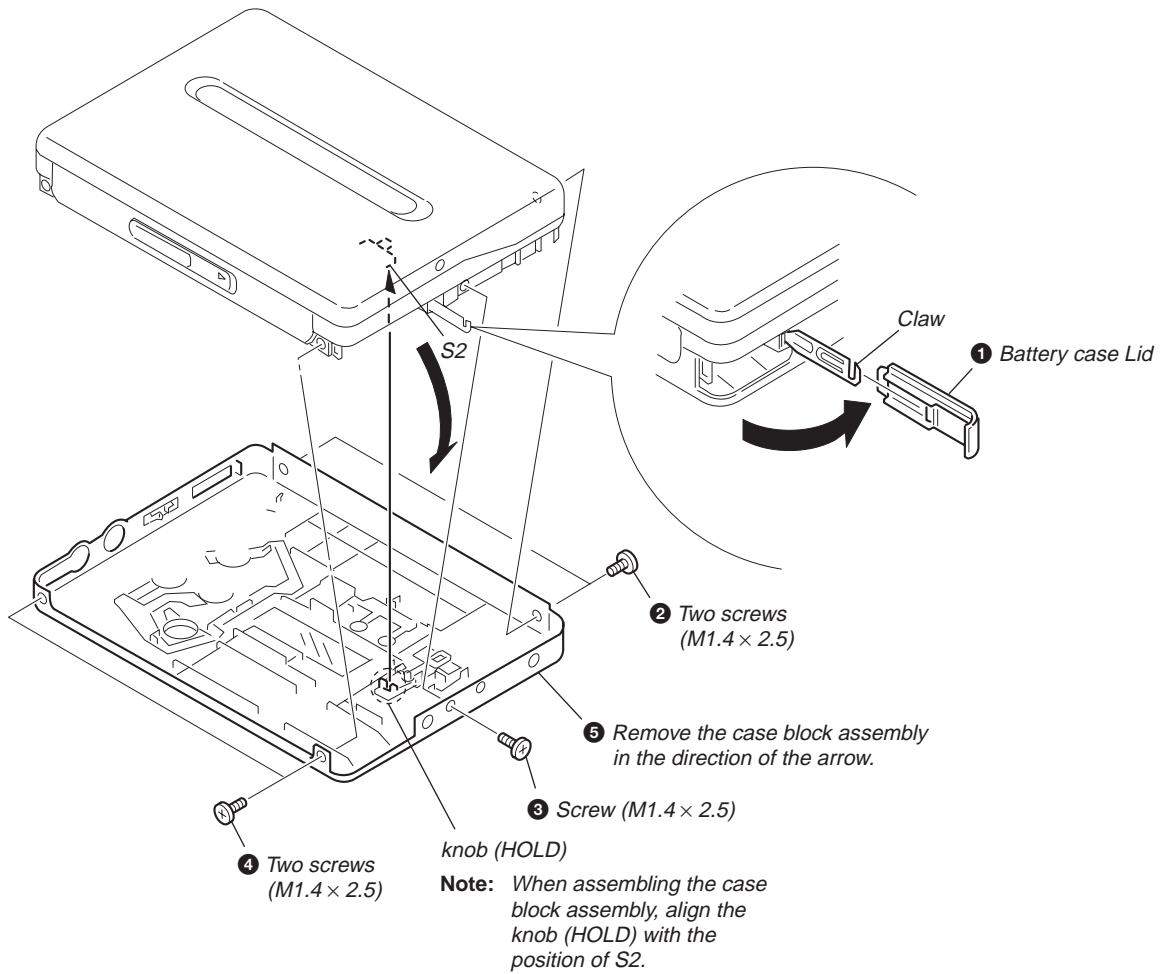
SECTION 3 DISASSEMBLY

Note : Disassemble the unit in the order as shown below.



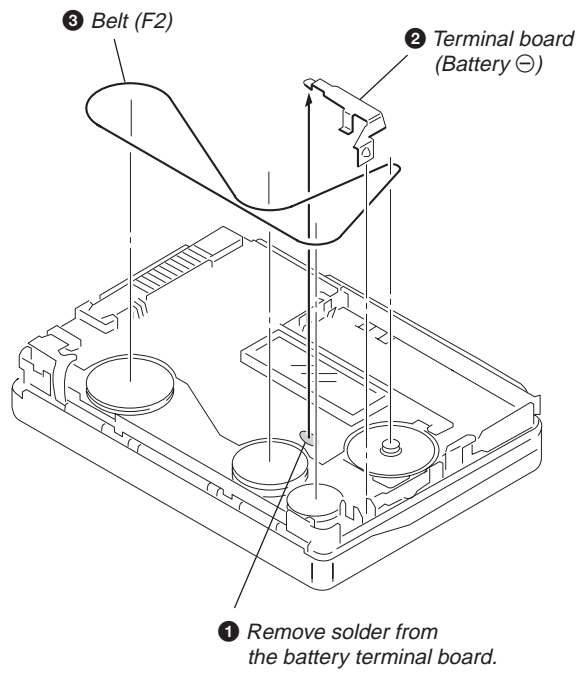
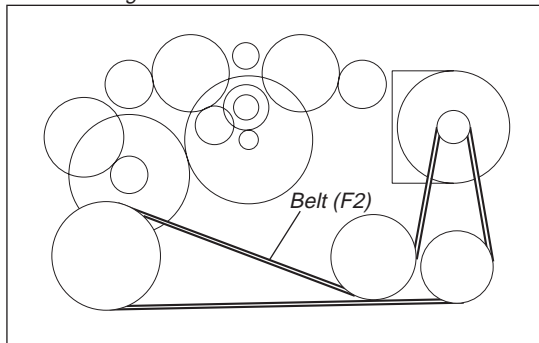
Note : Follow the disassembly procedure in the numerical order given.

3-1. CASE BLOCK ASSEMBLY

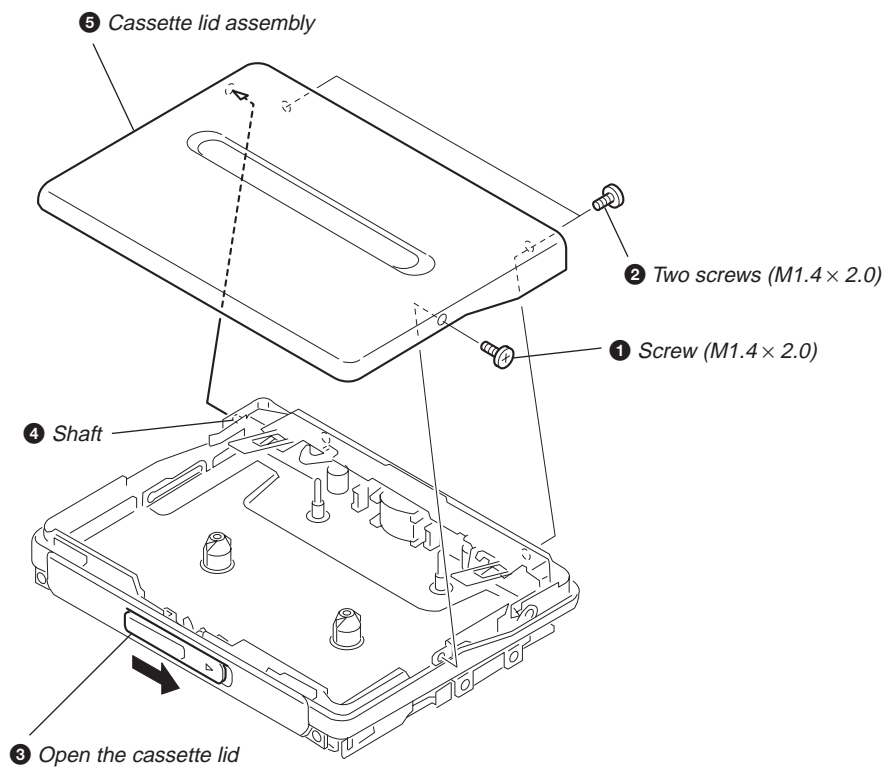


3-2. BELT (F2)

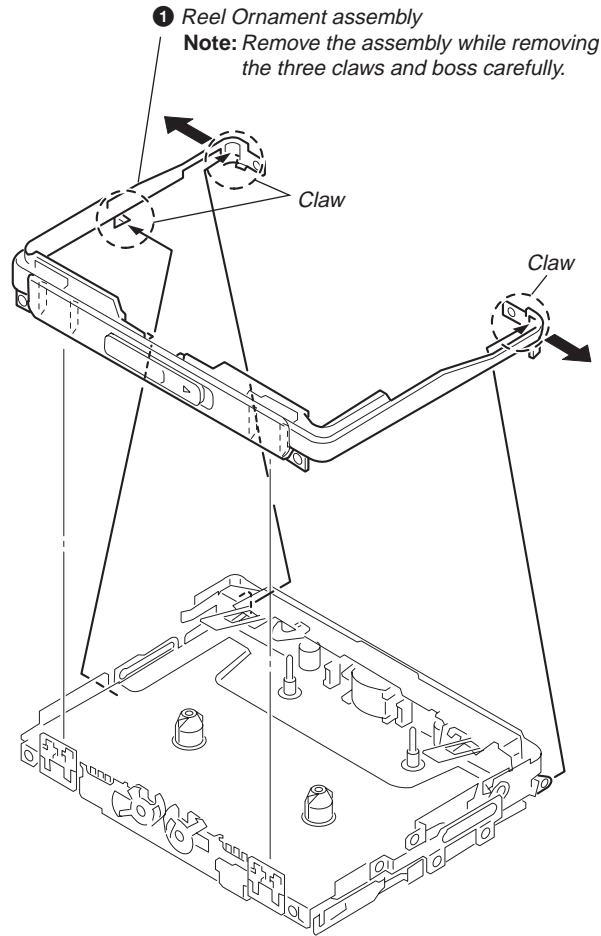
Belt threading



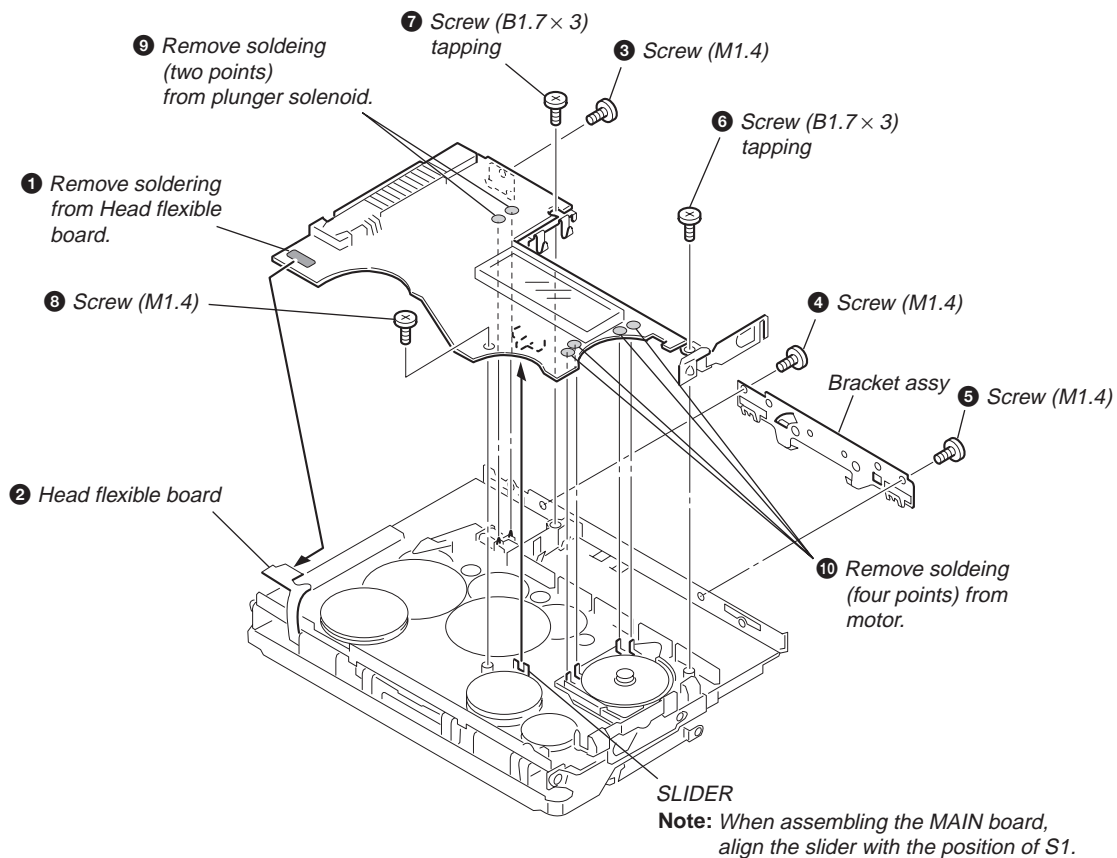
3-3. CASSETTE LID ASSEMBLY



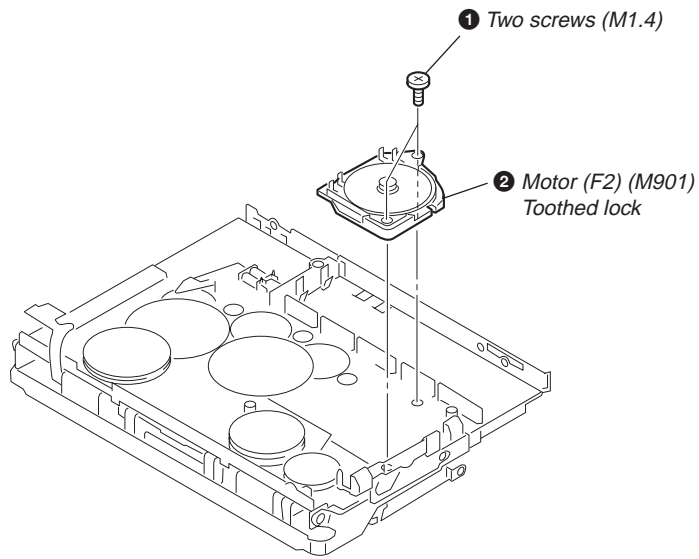
3-4. REEL ORNAMENT ASSEMBLY



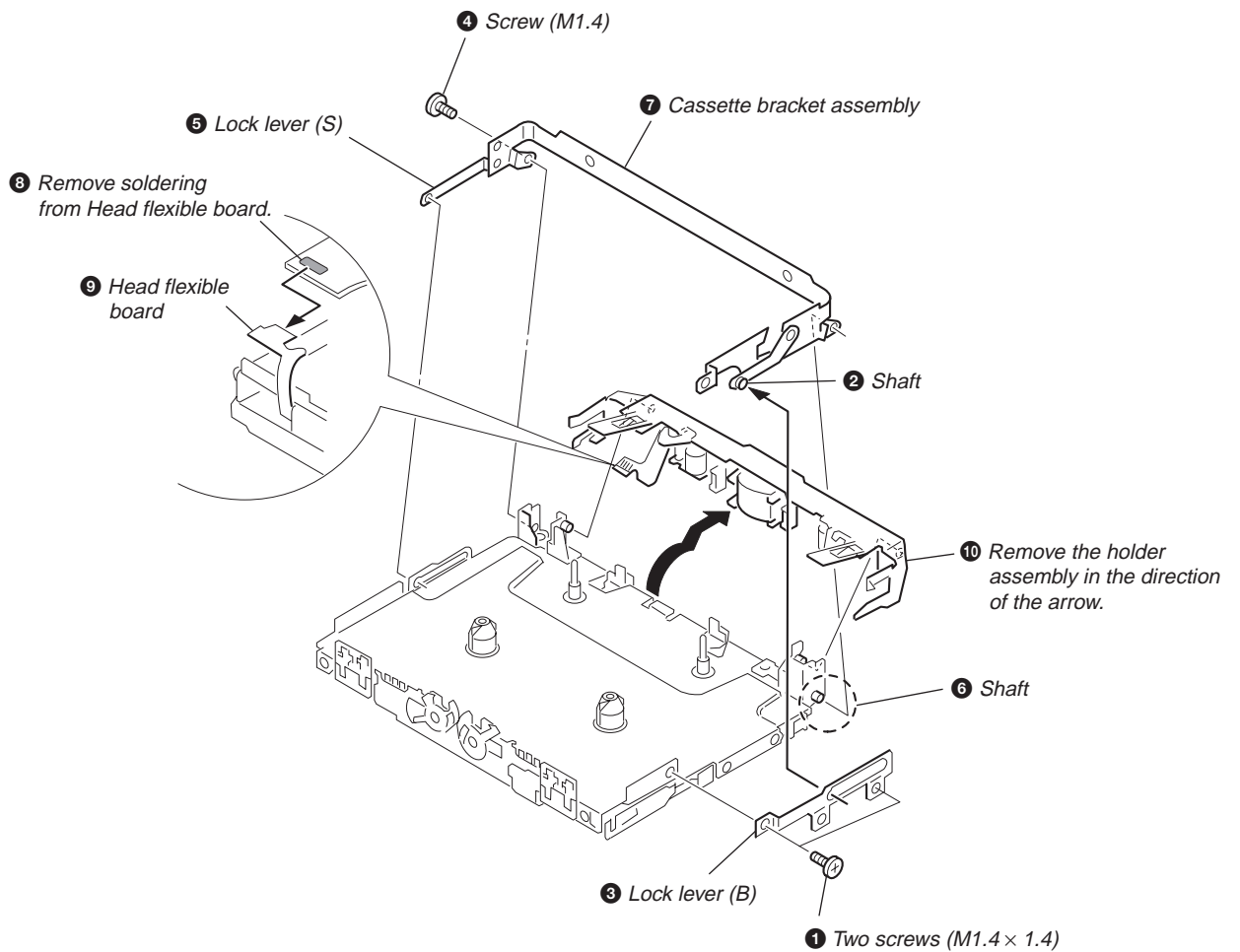
3-5. MAIN BOARD



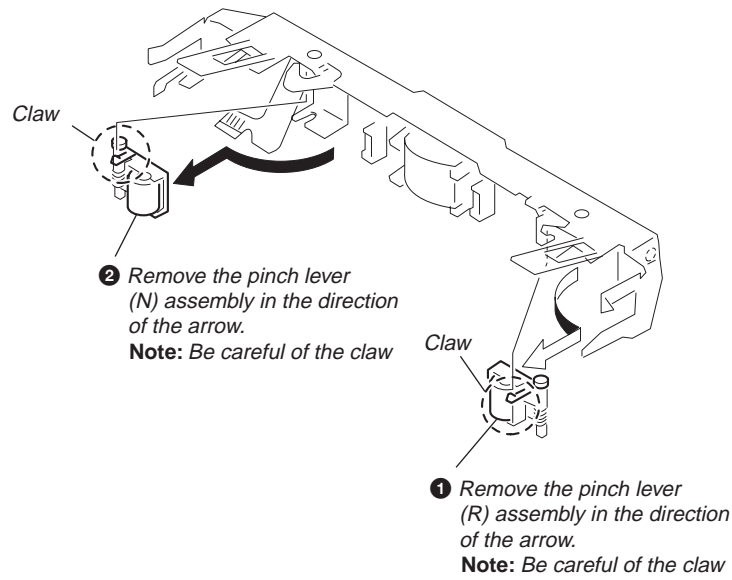
3-6. MOTOR (F2) (M901)



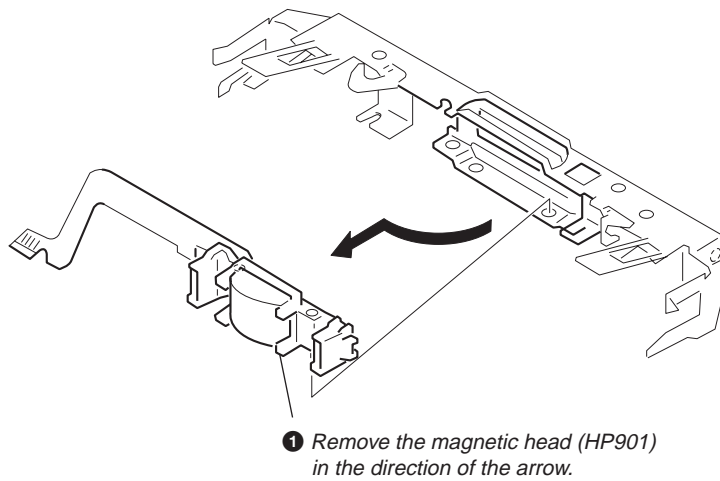
3-7. HOLDER ASSEMBLY



3-8. PINCH LEVER (N) / (R) ASSEMBLY



3-9. MAGNETIC HEAD (HP901)



SECTION 4 MECHANICAL ADJUSTMENT

PRECAUTION

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

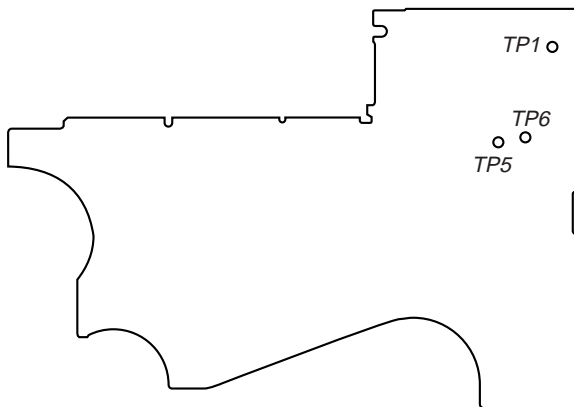
playback head	pinch roller
rubber belts	capstan
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated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

• Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	15 to 25 g•cm (0.21 to 0.34 oz•inch)
FWD Back Tension	CQ-102C	Less than 2.0g•cm (Less than 0.028 oz•inch)
REV	CQ-102RC	15 to 25 g•cm (0.21 to 0.34 oz•inch)
REV Back Tension	CQ-102RC	Less than 2.0g•cm (Less than 0.028 oz•inch)
FF, REW	CQ-201B	More than 50 g•cm (More than 0.69 oz•inch)

Adjustment Parts Location :

[MAIN BOARD] — SIDE A —



SECTION 5 ELECTRICAL ADJUSTMENT

PRECAUTION

1. Specified voltage: 1.3 V (DC)
2. Switch and control position
MENU switch

□□NR	: OFF
AVLS	: OFF
SOUND	: OFF
HOLD	: OFF
VOL	: MAX

TAPE SECTION

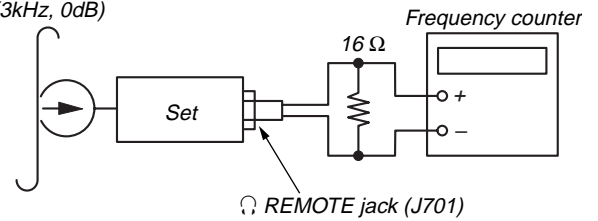
Test Tape

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

Tape Speed Adjustment

Procedure:

Test tape
WS-48A
(3kHz, 0dB)



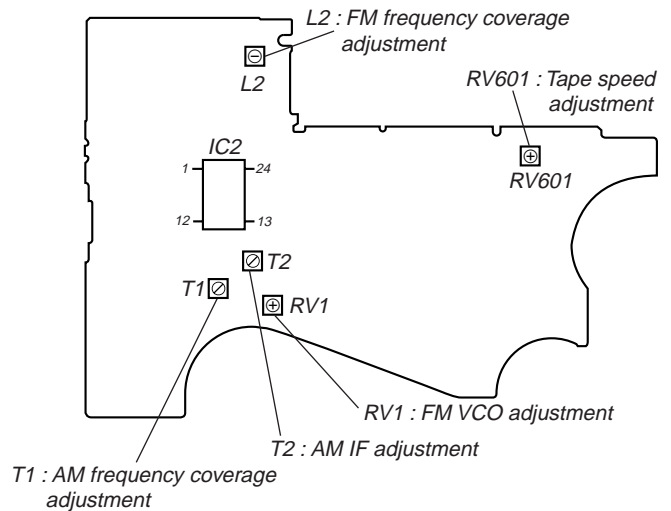
1. Enter the FWD playback mode.
2. Adjust RV601 so that the value of the frequency counter reading becomes 3,000 Hz.

Specification value:

Frequency counter
2,955 Hz – 3,060 Hz

3. Check that the frequency deviation at the beginning and ending of a tape is within 1.5 % (45 Hz).

[MAIN BOARD] — SIDE B —

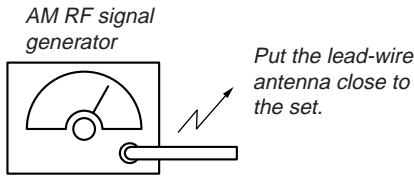


TUNER SECTION

0dB=1μV

[AM]

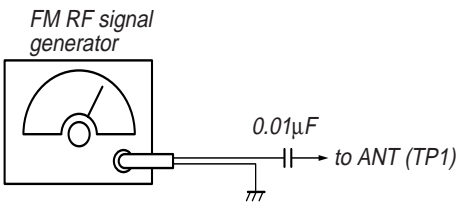
BAND switch : AM



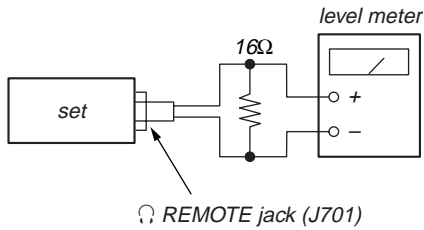
30% amplitude modulation by 400Hz signal.
Output level : as low as possible

[FM]

BAND : FM



22.5kHz frequency deviation by 400Hz signal.
Output level : as low as possible



- Repeat the procedures in each adjustment several times.

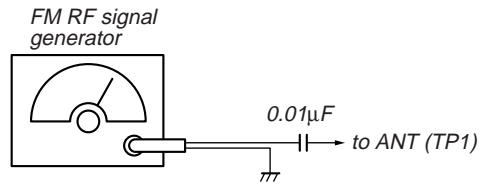
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	531 kHz

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T2	450 kHz

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L2	76 MHz

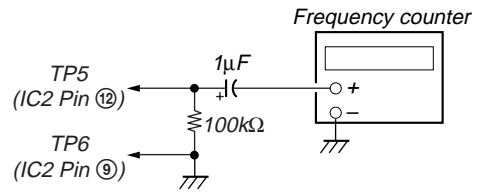
FM VCO Adjustment

Procedure :



Carrier frequency : 98MHz
Modulation : no modulation
Output level : 0.1V (100dB)

1. Connect frequency counter to the positions shown below.
2. Tune the set to 98 MHz.
3. Adjust RV1 so that the value of the frequency counter reading becomes 19 kHz.



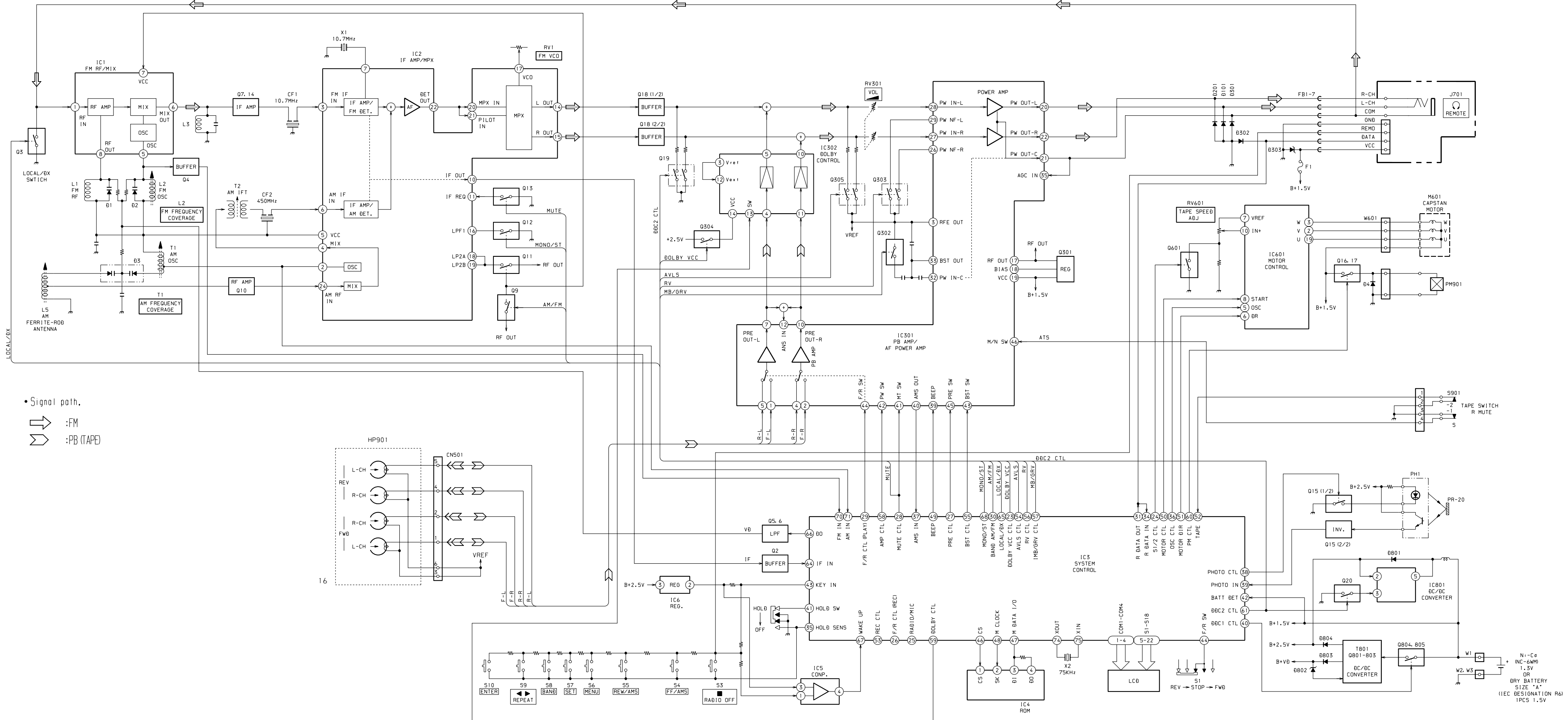
Specification Value :

Frequency counter
18,900 – 19,100 Hz

Adjustment Location: MAIN board (See page 11)

SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



• Signal path.
 ➔ : FM
 ➤ : PB (TAPE)

6-2. PRINTED WIRING BOARD



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D1	A-14	D304	B-8	IC5	D-18	Q5	D-15	Q16	C-15	Q602	C-19
D2	B-14	D305	G-9	IC6	C-19	Q6	C-15	Q17	C-15	Q801	D-3
D3	F-14	D801	D-4	IC301	F-17	Q7	B-13	Q18	F-15	Q802	C-2
D4	C-15	D802	E-3	IC302	E-9	Q8	C-16	Q19	F-16	Q803	D-2
D5	B-8	D803	D-3	IC601	D-19	Q9	D-6	Q20	C-6	Q804	C-3
D6	C-13	D804	D-3	IC801	D-3	Q10	C-13	Q301	E-19	Q805	C-2
D101	C-9					Q11	D-15	Q302	F-16		
D201	C-9	IC1	B-14	Q1	D-16	Q12	E-16	Q303	F-16		
D301	C-9	IC2	D-14	Q2	C-16	Q13	E-13	Q304	F-9		
D302	B-9	IC3	D-17	Q3	B-13	Q14	B-13	Q305	F-9		
D303	B-9	IC4	F-18	Q4	B-14	Q15	C-4	Q601	C-19		

Note on Printed Wiring Board:

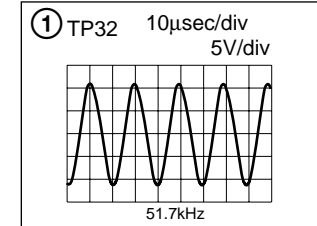
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- (with dot) : Through hole is omit.
- ▨ : Pattern from the side which enables seeing.

Caution:
 Pattern face side: Parts on the pattern face side seen from (SIDE B)
 Parts face side: Parts on the parts face side seen from (SIDE A)

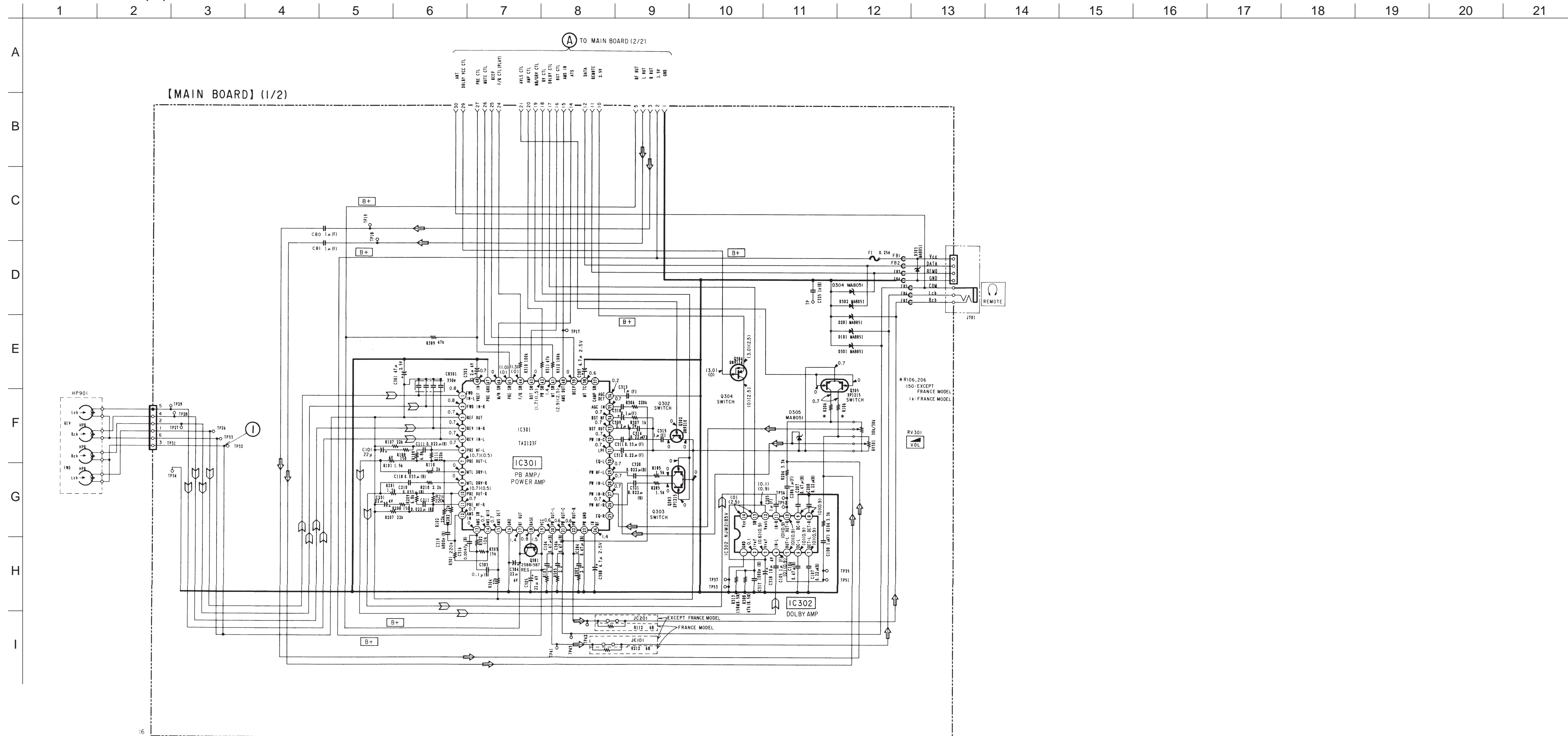
Note

- All capacitors are in μF unless otherwise noted. pF : μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- % : indicates tolerance.
- B+ : B+ Line.
- [] : panel designation.
- [] : adjustment for repair.
- Power voltage is dc 1.5 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, STOP (TAPE)
- () : FM
- [] : AM
- < > : PLAY (TAPE)
- Voltages are taken with a VOM (Input impedance 10 $\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- [] : FM
- [] : PLAY (TAPE)

Waveform

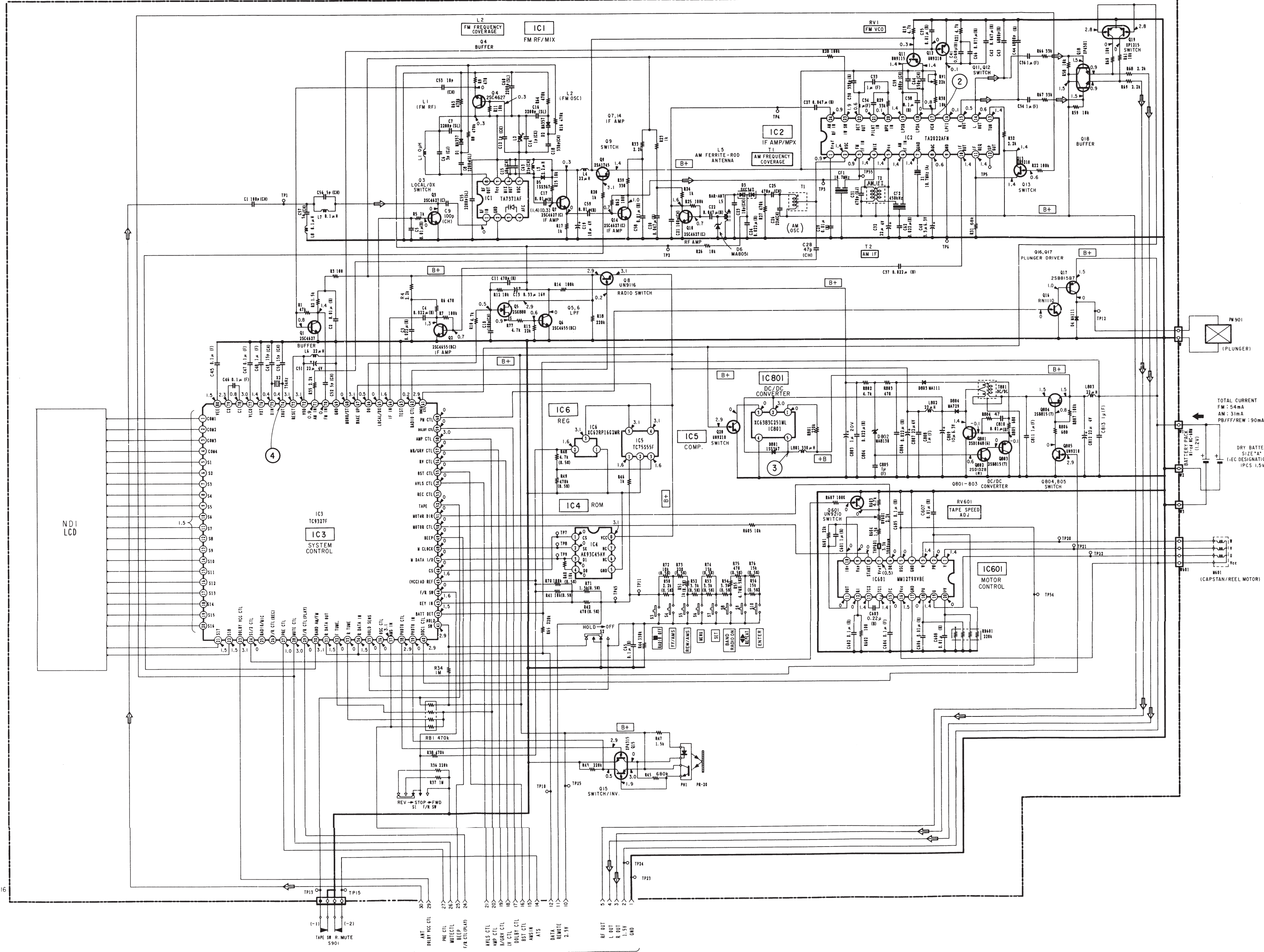


6-3. SCHEMATIC DIAGRAM (1/2)



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

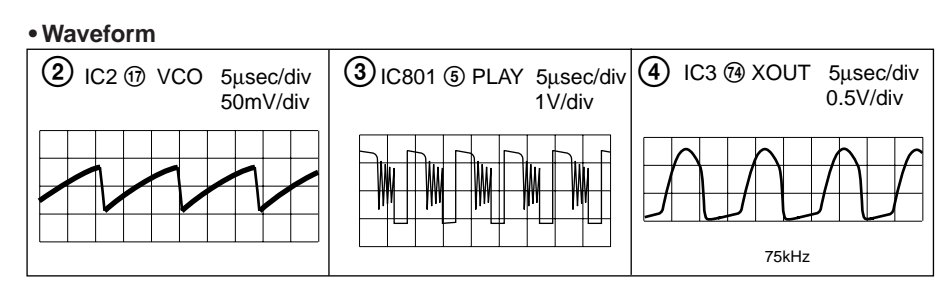
[MAIN BOARD] (2/2)



TOTAL CURRENT
FM: 54mA
AM: 31mA
PB/FF/REW: 190mA

DRY BATTERY
SIZE "A"
(IEC DESIGNATION R6)
1PCS 1.5V

TO MAIN BOARD (1/2)



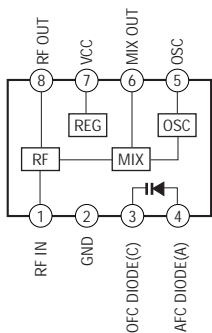
Note

- All capacitors are in μF unless otherwise noted. pF: μF/100
- 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.
- % : indicates tolerance.
- B+ : B+ Line.
- : panel designation.
- ▭ : adjustment for repair.
- Power voltage is dc 1.5 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 : PLAY

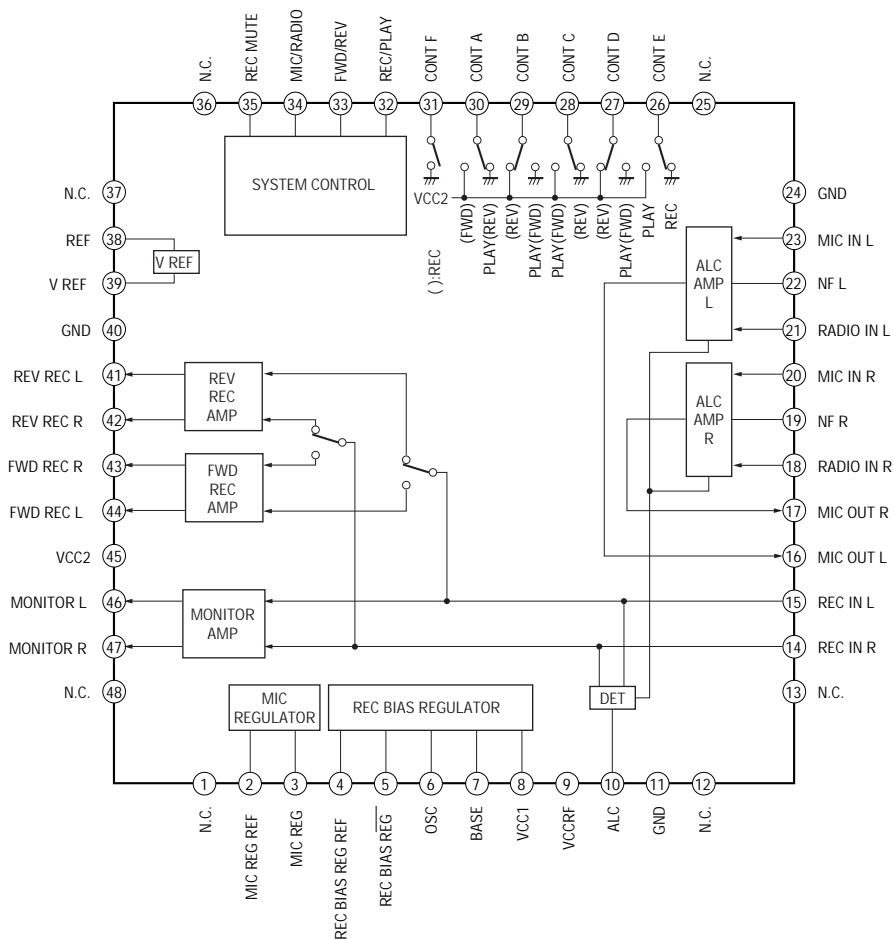
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- FM
- PLAY (TAPE)

6-5. IC BLOCK DIAGRAMS

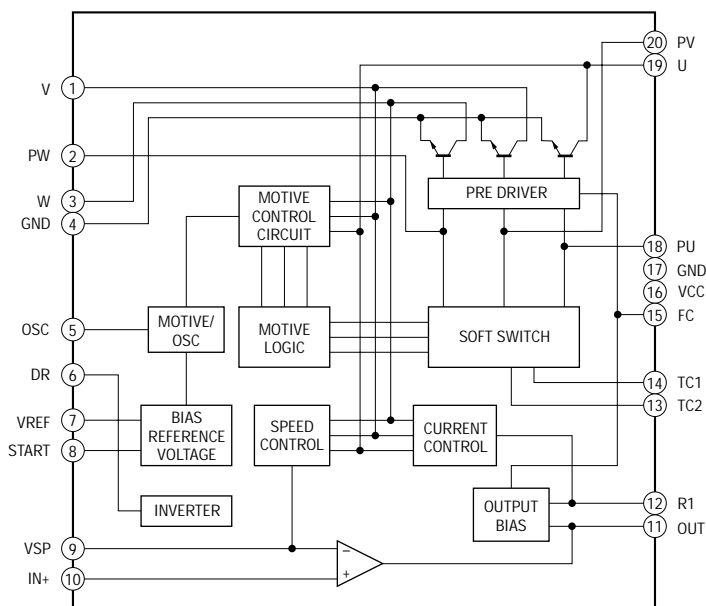
IC1 TA7371AF-EL



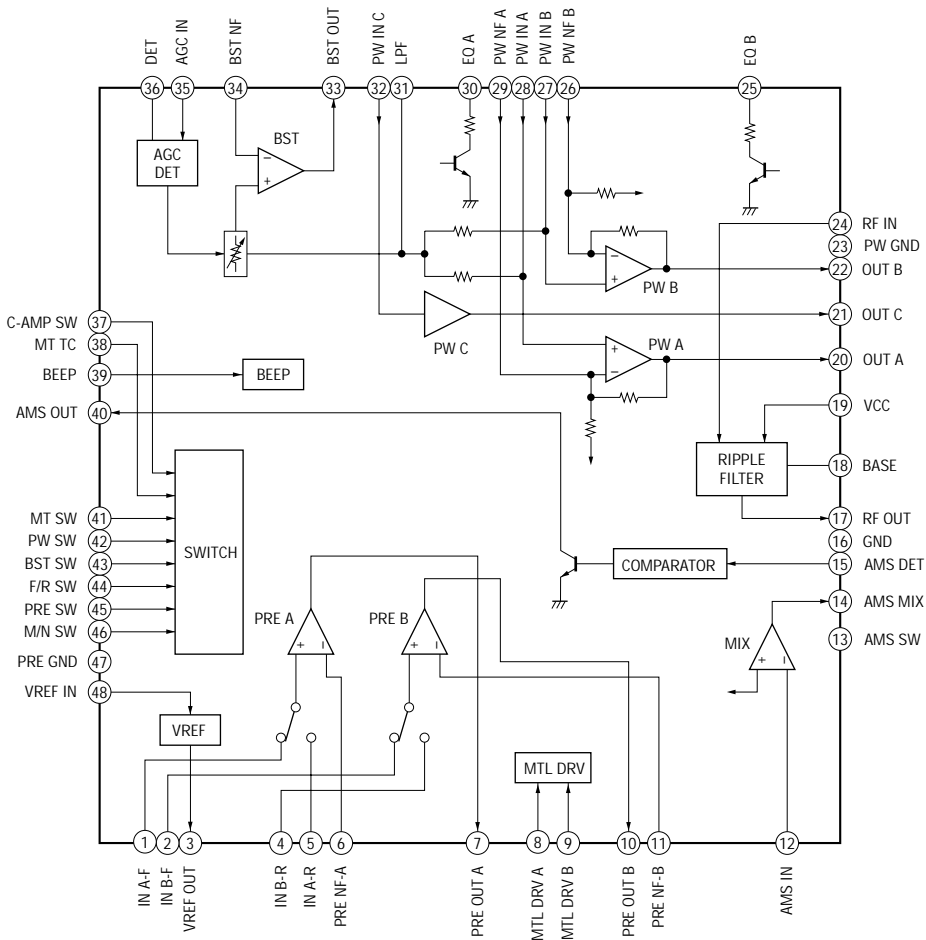
IC2 TA2022AFN-EL



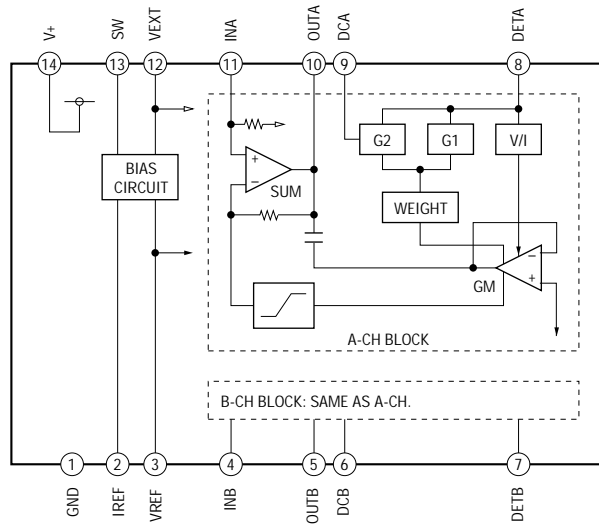
IC302 NJM2185AV-TE2



IC301 TA2123AF (EL)



IC601 MM1279XVBE



6-6. IC PIN FUNCTION DESCRIPTION

• IC3 TC9327AF-604

Pin No.	Pin Name	I/O	Description
1 to 4	COM 1 to COM 4	O	Common terminal.
5 to 22	S1 to S18	O	Segment output terminal.
23	DOLBY VCC CTL	O	Dolby control terminal. (L: ON, Hi-imp: OFF)
24	S1/2 CTL	O	Motor speed control terminal.
25	RADIO/MIC	—	Not used
26	F/R CTR (REC)	—	Not used
27	PRE CTL	O	PRE AMP control terminal.
28	MUTE CTL	O	MUTE control terminal (L: MUTE ON).
29	F/R CTL PLAY	O	HEAD select terminal (PLAY mode) (L: FWD, H: REW).
30	BAND AM/FM	O	BAND control output (L: FM, H: AM).
31	R DATA OUT	O	Remote control data output.
32	F TUME	I	TAPE error erase detect terminal. (FWD).
33	R TUME	I	TAPE error erase detect terminal. (REV).
34	R DATA IN	I	Remote control data input.
35	HOLD SENS	I	Input when the key is pressed during HOLD (H= AD Vref).
36	OSC CTL	I	Tape end Locking detect input terminal.
37	AMS IN	I	Tape sound existing or not-existing detect (L: Music exists: H: Music does not exist).
38	PHOTO CTL	O	Terminal for controlling the rotation detect circuit.
39	PHOTO IN	I	Rotation detect input.
40	DDC1 CTL	O	DDC control terminal (H: DDC ON).
41	HOLD SW	I	HOLD detect input (L: HOLD ON).
42	BATT DET	I	Voltage detect input.
43	KEY IN	I	KEY input terminal.
44	F/R SW	I	TAPE rotating direction detect terminal.
45	(VCC) AD REF	I	AD IN 1, 2, 3 reference viltage interrupt terminal.
46	CS	O	E ² PROM CS control terminal.
47	M DATA I/O	I/O	E ² PROM DATA I/O.
48	M CLOCK	O	E ² PROM CLOCK terminal.
49	BEEP	O	BEEP (when TC: 1.6kHz, when CF: 3.0kHz).
50	MOTOR CTL	O	MOTOR control terminal.

Pin No.	Pin Name	I/O	Description
51	MOTOR DIR	O	MOTOR control terminal.
52	TAPE	I	TAPE detect terminal. (L: ON, H: OFF)
53	REC CTL	—	Not used
54	AVLS CTL	O	Terminal for controlling AVLS (when ON=H).
55	BST CTL	O	Tone control terminal (L: normal, Hi-imp: MEGA BASS).
56	RV CTL	O	Revive control terminal.
57	MB/GRV CTL	O	Tone control terminal (L: GRV, H: MB).
58	AMP CTL	O	AMP control output (H: AMP ON).
59	DOLBY CTL	O	Terminal for controlling DOLBY circuit (L: OFF, Hi-imp: ON).
60	PM CTL	O	PL control terminal.
61	DDC2 CTL	O	DDC control terminal (L: OFF, Hi-imp: ON).
62	RADIO CTL	O	RADIO system control terminal (L: RADIO ON).
63	TEST	I	TEST terminal (Normal operation at L or NC).
64	IF IN	I	IF input.
65	LOCAL/DX	O	TUNER sensitivity select terminal (H: LOCAL, L: DX).
66	DO	O	Phase comparator output.
67	WAKE UP	I	External interrupt terminal (Interrupt by key input).
68	MONO/ST	O	FM MONO/STEREO select terminal (H: MONO, L: ST).
69	GND	—	Power supply Ground terminal.
70	FM IN	I	FM local oscillator input.
71	AM IN	I	AM local oscillator input.
72	VDD	—	Power supply voltage.
73	RESET	I	RESET terminal (H during operation).
74	XOUT	O	Terminal to which external oscillator is connected.
75	XIN	I	
76	VXT	—	Terminal to which external capacitor is connected to stabilize crystal oscillator power supply.
77	VLCD	—	Terminal to step-up power supply voltage for LCD drive. (3V)
78	C1	—	Terminal to step-up power supply voltage for LCD drive.
79	C2	—	
80	VEE	—	Terminal for 1.5V constant voltage power supply of LCD drive.

SECTION 7 EXPLODED VIEWS

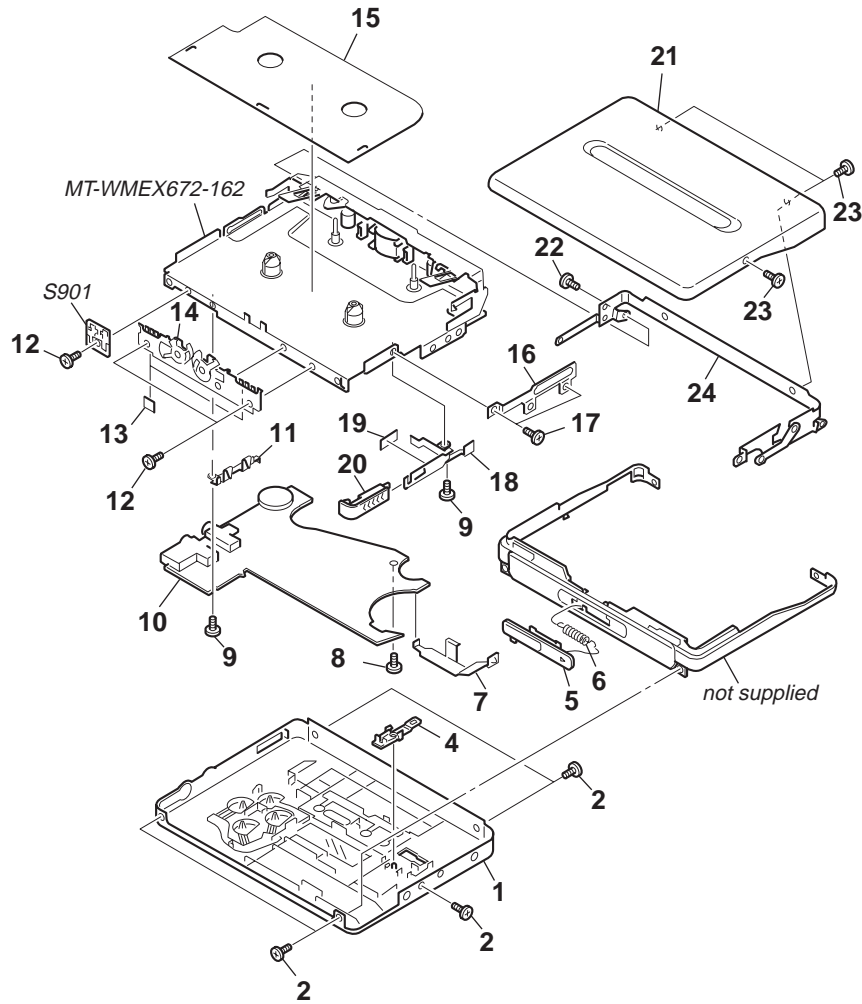
NOTE:

- -XX, -X mean standardized parts, so they may have some differences 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.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

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

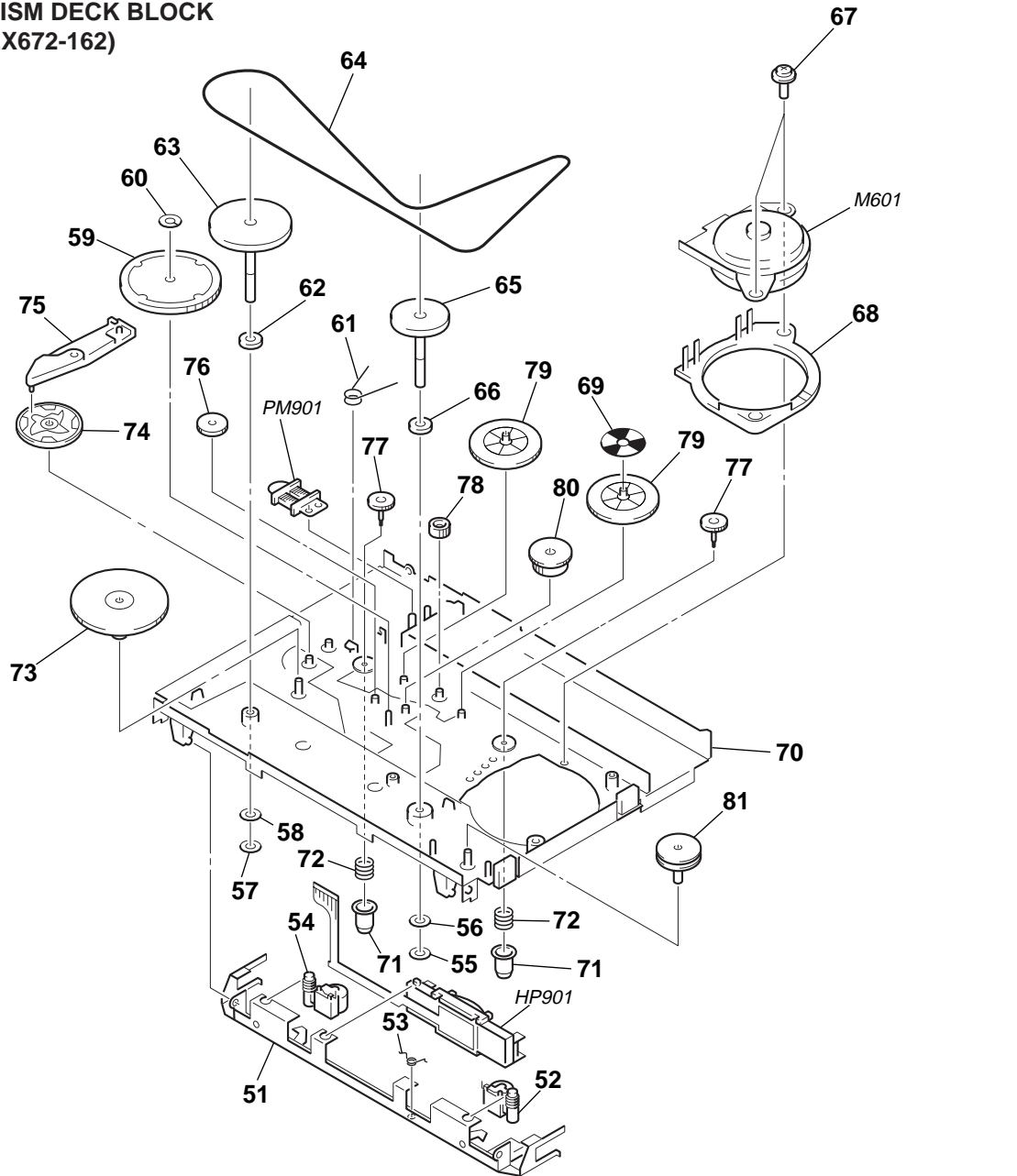
- Abbreviation
FR : French model
CET : East European and CIS model

7-1. CABINET BLOCK, MAIN BOARD



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-3377-346-1	CASE(FX-AS1) ASSY (US)		13	3-328-483-21	SHEET	
1	X-3377-356-1	CASE(FX-AS10) ASSY (AEP,FR,CET)		14	X-3376-277-2	BRACKET ASSY	
2	3-704-197-21	SCREW(M1.4 × 2.5), LOCKING		15	3-029-205-11	COVER, MD	
4	3-034-075-01	LEVER(HOLD)		16	3-029-217-01	LEVER (B), LOCK	
5	3-029-219-01	KNOB(OPEN)		17	3-366-892-11	SCREW (M1.4 × 1.4)	
6	3-029-220-01	SPRING, TENSION		18	X-3377-281-1	TERMINAL BOARD ASSY, BATTERY	
7	3-029-213-01	TERMINAL BOARD		19	3-031-460-01	SHEET (BT)	
8	3-345-648-71	SCREW(M1.4), TOOTHED LOCK		20	3-034-068-21	LID,BATTERY	
9	3-893-942-11	SCREW(1.7 × 3), TAPPING (B)		21	A-3052-005-A	LIDBLOCK ASSY, CASSETTE	
10	A-3021-222-A	MAIN BOARD, COMPLETE (US,AEP,CET)		22	3-365-630-41	SCREW (M1.4)	
10	A-3021-223-A	MAIN BOARD, COMPLETE (FR)		23	3-704-197-11	SCREW (M1.4 × 2.0), LOCKING	
11	3-029-210-01	TERMINAL BOARD (MINUS)		24	X-3376-279-1	BRACKET (CASSETTE) ASSY	
12	3-366-892-01	SCREW (M1.4)		S901	1-762-553-11	SWITCH, LEAF	

**7-2. MECHANISM DECK BLOCK
(MT-WMEX672-162)**



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	X-3377-039-1	HOLDER ASSY (/M)		69	3-007-433-01	SHEET (N), REFLECTION	
52	X-3377-363-1	PINCH LEVER (R) ASSY		70	X-3377-037-1	CHASSIS ASSY (F) (/M)	
53	3-029-271-01	SPRING (HD)		71	3-010-274-02	TABLE, REEL	
54	X-3377-362-1	PINCH LEVER (N) ASSY		72	3-010-954-01	SPRING (BT), COMPRESSION	
55	3-029-275-01	WASHER (STOPPER N)		73	3-029-282-01	GEAR(Y)	
56	3-029-278-01	WASHER		74	3-029-285-01	GEAR, CAM	
57	3-029-276-01	WASHER (STOPPER R)		75	3-029-284-01	LEVER, TRIGGER	
58	3-029-289-01	WASHER		76	3-029-281-01	GEAR, IDLER (B)	
59	X-3376-813-1	CLUTCH ASSY (F)		77	3-010-273-02	GEAR(REEL)	
60	3-932-724-21	WASHER		78	3-029-273-01	GEAR(FR)	
61	3-029-287-01	SPRING (TG), TORSION		79	3-029-283-01	GEAR, IDLER (A)	
62	3-386-694-01	WASHER		80	3-029-286-01	GEAR(NR)	
63	3-029-306-11	FLYWHEEL (N), INSERT		81	3-029-288-01	PULLEY, REVERSE	
64	3-029-280-01	BELT(F2)		M601	1-763-166-11	MOTOR(CAPSTAN/REEL)(WITH PULLEY)	
65	3-029-268-11	FLYWHEEL (R), INSERT		HP901	1-500-576-11	HEAD, MAGNETIC (PLAYBACK)	
66	3-007-428-01	WASHER (R)		PM901	1-454-674-31	SOLENOID, PLUNGER	
67	3-029-765-01	SCREW (M1.4), TOOTHED LOCK					
68	3-029-274-01	RETAINER (F2), MOTOR					

SECTION 8 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.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- **CAPACITORS:**
uF: μ F
- **RESISTORS**
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- **COILS**
uH: μ H
- **Abbreviation**
FR : French model
CET : East European and CIS model

- **SEMICONDUCTORS**
In each case, u: μ , for example:
uA...: μ A... , uPA... , μ PA... ,
uPB... , μ PB... , uPC... , μ PC... ,
uPD... , μ PD...

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

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-3021-222-A	MAIN BOARD, COMPLETE (US,AEP,CET) *****		C41	1-110-563-11	CERAMIC CHIP 0.068uF 10%	16V
*	A-3021-223-A	MAIN BOARD, COMPLETE (FR) *****		C42	1-165-176-11	CERAMIC CHIP 0.047uF 10%	16V
	1-694-502-11	CONDUCTIVE BOARD, CONNECTION		C43	1-162-969-11	CERAMIC CHIP 0.0068uF 10%	25V
	3-034-073-01	HOLDER(LCD)		C44	1-162-969-11	CERAMIC CHIP 0.0068uF 10%	25V
		< CAPACITOR >		C45	1-164-360-11	CERAMIC CHIP 0.1uF	16V
C1	1-162-927-11	CERAMIC CHIP 100PF 5%	50V	C46	1-164-360-11	CERAMIC CHIP 0.1uF	16V
C2	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V	C47	1-164-360-11	CERAMIC CHIP 0.1uF	16V
C3	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V	C48	1-115-156-11	CERAMIC CHIP 1uF	10V
C4	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V	C49	1-162-917-11	CERAMIC CHIP 15PF 5%	50V
C5	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V	C50	1-162-917-11	CERAMIC CHIP 15PF 5%	50V
C6	1-162-908-11	CERAMIC CHIP 3PF 0.25PF	50V	C51	1-125-984-21	TANTAL. CHIP 22uF 20%	4V
C7	1-164-676-11	CERAMIC CHIP 2200PF 5%	16V	C52	1-162-910-11	CERAMIC CHIP 5PF 0.25PF	50V
C8	1-164-676-11	CERAMIC CHIP 2200PF 5%	16V	C53	1-162-915-11	CERAMIC CHIP 10PF 0.5PF	50V
C9	1-162-927-11	CERAMIC CHIP 100PF 5%	50V	C54	1-115-156-11	CERAMIC CHIP 1uF	10V
C10	1-162-927-11	CERAMIC CHIP 100PF 5%	50V	C55	1-164-676-11	CERAMIC CHIP 2200PF 5%	16V
C11	1-162-962-11	CERAMIC CHIP 470PF 10%	50V	C56	1-162-910-11	CERAMIC CHIP 5PF 0.25PF	50V
C12	1-162-905-11	CERAMIC CHIP 1PF 0.25PF	50V	C57	1-162-910-11	CERAMIC CHIP 5PF 0.25PF	50V
C13	1-107-817-11	TANTAL. CHIP 0.33uF 10%	16V	C58	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C14	1-162-905-11	CERAMIC CHIP 1PF 0.25PF	50V	C59	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C15	1-162-925-11	CERAMIC CHIP 68PF 5%	50V	C60	1-164-676-11	CERAMIC CHIP 2200PF 5%	16V
C16	1-164-676-11	CERAMIC CHIP 2200PF 5%	16V	C62	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V
C17	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V	C63	1-162-919-11	CERAMIC CHIP 22PF 5%	50V
C18	1-162-959-11	CERAMIC CHIP 330PF 5%	50V	C64	1-164-217-11	CERAMIC CHIP 150PF 5%	50V
C19	1-135-201-11	TANTALUM CHIP 10uF 20%	4V	C65	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V
C20	1-165-176-11	CERAMIC CHIP 0.047uF 10%	16V	C66	1-164-245-11	CERAMIC CHIP 0.015uF 10%	25V
C21	1-162-927-11	CERAMIC CHIP 100PF 5%	50V	C80	1-115-156-11	CERAMIC CHIP 1uF	10V
C22	1-165-176-11	CERAMIC CHIP 0.047uF 10%	16V	C81	1-115-156-11	CERAMIC CHIP 1uF	10V
C23	1-162-915-11	CERAMIC CHIP 10PF 0.5PF	50V	C101	1-125-984-21	TANTAL. CHIP 22uF 20%	4V
C24	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V	C104	1-113-619-11	CERAMIC CHIP 0.47uF 10%	6.3V
C25	1-164-315-11	CERAMIC CHIP 470PF 5%	50V	C105	1-115-156-11	CERAMIC CHIP 1uF	10V
C26	1-162-919-11	CERAMIC CHIP 22PF 5%	50V	C106	1-113-619-11	CERAMIC CHIP 0.47uF 10%	6.3V
C27	1-165-176-11	CERAMIC CHIP 0.047uF 10%	16V	C107	1-115-467-11	CERAMIC CHIP 0.22uF 10%	10V
C28	1-162-923-11	CERAMIC CHIP 47PF 5%	50V	C108	1-115-156-11	CERAMIC CHIP 1uF	10V
C29	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V	C110	1-164-677-11	CERAMIC CHIP 0.033uF 10%	16V
C30	1-162-961-11	CERAMIC CHIP 330PF 10%	50V	C111	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V
C31	1-164-362-11	CERAMIC CHIP 470PF 5%	50V	C201	1-125-984-21	TANTAL. CHIP 22uF 20%	4V
C32	1-125-984-21	TANTAL. CHIP 22uF 20%	4V	C204	1-113-619-11	CERAMIC CHIP 0.47uF 10%	6.3V
C33	1-115-156-11	CERAMIC CHIP 1uF	10V	C205	1-115-156-11	CERAMIC CHIP 1uF	10V
C34	1-115-156-11	CERAMIC CHIP 1uF	10V	C206	1-115-156-11	CERAMIC CHIP 1uF	10V
C35	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V	C207	1-113-619-11	CERAMIC CHIP 0.47uF 10%	6.3V
C36	1-115-156-11	CERAMIC CHIP 1uF	10V	C208	1-115-467-11	CERAMIC CHIP 0.22uF 10%	10V
C37	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V	C210	1-164-677-11	CERAMIC CHIP 0.033uF 10%	16V
C38	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V	C211	1-164-227-11	CERAMIC CHIP 0.022uF 10%	25V
C39	1-115-412-11	CERAMIC CHIP 680PF 5%	25V	C301	1-119-663-11	TANTAL. CHIP 47uF 20%	2.5V
C40	1-127-578-91	TANTAL. CHIP 3.3uF 20%	6.3V	C302	1-107-815-11	TANTAL. CHIP 2.2uF 20%	4V
				C303	1-164-360-11	CERAMIC CHIP 0.1uF	16V
				C304	1-125-984-21	TANTAL. CHIP 22uF 20%	4V
				C305	1-125-984-21	TANTAL. CHIP 22uF 20%	4V
				C306	1-113-619-11	CERAMIC CHIP 0.47uF 10%	6.3V
				C307	1-117-181-11	TANTAL. CHIP 4.7uF 20%	2.5V

MAIN

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C308	1-117-181-11	TANTAL. CHIP	4.7uF 20%			< FUSE >	
C309	1-135-149-21	TANTALUM CHIP	2.2uF 20%				
C310	1-164-360-11	CERAMIC CHIP	0.1uF				
C311	1-165-112-11	CERAMIC CHIP	0.33uF				
C312	1-165-128-11	CERAMIC CHIP	0.22uF			< FERRITE BEAD >	
C313	1-115-156-11	CERAMIC CHIP	1uF				
C314	1-165-128-11	CERAMIC CHIP	0.22uF				
C315	1-115-156-11	CERAMIC CHIP	1uF				
C316	1-162-968-11	CERAMIC CHIP	0.0047uF 10%				
C317	1-162-964-11	CERAMIC CHIP	0.001uF 10%				
C318	1-135-201-11	TANTALUM CHIP	10uF 20%				
C319	1-164-360-11	CERAMIC CHIP	0.1uF				
C320	1-164-227-11	CERAMIC CHIP	0.022uF 10%				
C321	1-164-227-11	CERAMIC CHIP	0.022uF 10%			< IC >	
C325	1-125-837-91	CERAMIC CHIP	1uF 10%				
C601	1-125-837-91	CERAMIC CHIP	1uF 10%				
C602	1-107-826-91	CERAMIC CHIP	0.1uF 10%				
C603	1-115-467-11	CERAMIC CHIP	0.22uF 10%				
C604	1-164-360-11	CERAMIC CHIP	0.1uF				
C605	1-107-826-91	CERAMIC CHIP	0.1uF 10%				
C606	1-162-970-11	CERAMIC CHIP	0.01uF 10%				
C607	1-162-970-11	CERAMIC CHIP	0.01uF 10%				
C608	1-162-970-11	CERAMIC CHIP	0.01uF 10%				
C803	1-135-177-21	TANTALUM CHIP	1uF 20%				
C804	1-164-227-11	CERAMIC CHIP	0.022uF 10%				
C805	1-125-837-91	CERAMIC CHIP	1uF 10%				
C806	1-164-227-11	CERAMIC CHIP	0.022uF 10%				
C807	1-125-984-21	TANTAL. CHIP	22uF 20%				
C808	1-115-156-11	CERAMIC CHIP	1uF				
C809	1-127-808-21	TANTAL. CHIP	10uF 20%				
C810	1-162-970-11	CERAMIC CHIP	0.01uF 10%				
C811	1-115-156-11	CERAMIC CHIP	1uF				
C812	1-125-984-21	TANTAL. CHIP	22uF 20%				
C813	1-115-156-11	CERAMIC CHIP	1uF				
< CAPACITOR COMPOSITION CIRCUIT BLOCK >							
CB301	1-127-678-21	CERAMIC CHIP 330PF	0				
< FILTER >							
CF1	1-767-362-11	FILTER, CERAMIC 10.7MHz					
CF2	1-767-480-11	FILTER, CERAMIC (AM) 450kHz					
< DIODE >							
D1	8-719-053-30	DIODE MA2S357-(TX). SO					
D2	8-719-053-30	DIODE MA2S357-(TX). SO					
D3	8-719-072-58	DIODE SVC347-TL					
D4	8-719-404-50	DIODE MA111-TX					
D5	8-719-049-09	DIODE 1SS367-T3SONY					
D6	8-719-422-37	DIODE MA8051					
D101	8-719-422-37	DIODE MA8051					
D201	8-719-422-37	DIODE MA8051					
D301	8-719-422-37	DIODE MA8051					
D302	8-719-422-37	DIODE MA8051					
D303	8-719-422-37	DIODE MA8051					
D304	8-719-422-37	DIODE MA8051					
D305	8-719-422-37	DIODE MA8051					
D801	8-719-049-09	DIODE 1SS367-T3SONY					
D802	8-719-420-87	DIODE MA8130					
D803	8-719-404-50	DIODE MA111-TX					
D804	8-719-420-51	DIODE MA729					
F1	1-533-792-11	FUSE (SMD)(0.25A/125V)					
FB1	1-500-445-21	FERRITE				0uH	
FB2	1-500-445-21	FERRITE				0uH	
FB3	1-500-445-21	FERRITE				0uH	
FB4	1-500-245-11	FERRITE				0uH	
FB5	1-500-245-11	FERRITE				0uH	
FB6	1-500-245-11	FERRITE				0uH	
FB7	1-500-245-11	FERRITE				0uH	
< IC >							
IC1	8-759-362-23	IC TA7371AF-EL					
IC2	8-759-362-25	IC TA2022AFN-EL					
IC3	8-759-574-08	IC TC9327AF-604					
IC4	8-759-457-68	IC AK93C45AV-L					
IC5	8-759-387-31	IC TC75S55F(TE85R)					
IC6	8-759-457-70	IC XC62RP1602MR					
IC301	8-759-579-12	IC TA2123AF(EL)					
IC302	8-759-488-80	IC NJM2185AV-TE2					
IC601	8-759-356-46	IC MM1279XVBE					
IC801	8-759-553-28	IC XC6383C251ML					
< JACK >							
J701	1-779-867-81	JACK (REMOTE)					
< JUMPER CHIP >							
JC101	1-216-864-11	METAL CHIP	0			5%	1/16W (US,AEP,CET)
JC201	1-216-864-11	METAL CHIP	0			5%	1/16W (US,AEP,CET)
< COIL >							
L1	1-469-373-21	INDUCTOR				0uH	
L2	1-416-941-21	COIL(FM OSC)					
L3	1-410-997-42	INDUCTOR CHIP				2.2uH	
L4	1-412-995-21	INDUCTOR				22uH	
L5	1-754-046-11	ANTENNA, FERRITE-ROD					
L6	1-412-995-21	INDUCTOR				22uH	
L7	1-412-967-31	INDUCTOR				0.1uH	
L8	1-412-967-31	INDUCTOR				0.1uH	
L801	1-412-034-11	INDUCTOR CHIP				330uH	
L802	1-412-995-21	INDUCTOR				22uH	
L803	1-412-010-41	INDUCTOR CHIP				22uH	
< FLUORESCENT INDICATOR >							
ND1	1-803-469-11	DISPLAY PANEL, LIQUID CRYSTAL					
< PHOTO INTERRUPTER >							
PH1	8-749-014-43	PHOTO PR-20-T					

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
		< TRANSISTOR >		R26	1-216-833-91	RES,CHIP 10K	5% 1/16W
Q1	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R27	1-216-853-11	METAL CHIP 470K	5% 1/16W
Q2	8-729-028-69	TRANSISTOR 2SC4655-BC(TX)		R28	1-216-845-11	METAL CHIP 100K	5% 1/16W
Q3	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R29	1-216-839-11	METAL CHIP 33K	5% 1/16W
Q4	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R30	1-216-833-91	RES,CHIP 10K	5% 1/16W
Q5	8-729-231-96	TRANSISTOR 2SK880GR-TE85L		R31	1-216-843-11	METAL CHIP 68K	5% 1/16W
Q6	8-729-028-69	TRANSISTOR 2SC4655-BC(TX)		R32	1-216-825-11	METAL CHIP 2.2K	5% 1/16W
Q7	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R33	1-216-825-11	METAL CHIP 2.2K	5% 1/16W
Q8	8-729-037-64	TRANSISTOR UN9116J-(TX).SO		R34	1-216-857-11	METAL CHIP 1M	5% 1/16W
Q9	8-729-823-86	TRANSISTOR 2SA1745		R35	1-216-825-11	METAL CHIP 2.2K	5% 1/16W
Q10	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R36	1-216-849-11	METAL CHIP 220K	5% 1/16W
Q11	8-729-037-63	TRANSISTOR UN9115J-(TX).SO		R37	1-216-857-11	METAL CHIP 1M	5% 1/16W
Q12	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R38	1-216-853-11	METAL CHIP 470K	5% 1/16W
Q13	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R39	1-216-815-11	METAL CHIP 330	5% 1/16W
Q14	8-729-037-89	TRANSISTOR 2SC4627J-C(TX).SO		R40	1-216-833-91	RES,CHIP 10K	5% 1/16W
Q15	8-729-425-46	TRANSISTOR XP4315-TXE		R41	1-218-871-11	RES,CHIP 10K	0.50% 1/16W
Q16	8-729-013-60	TRANSISTOR RN1110-TE85L		R42	1-218-839-11	RES,CHIP 470	0.50% 1/16W
Q17	8-729-800-71	TRANSISTOR 2SB815B7-TB		R43	1-216-849-11	METAL CHIP 220K	5% 1/16W
Q18	8-729-427-72	TRANSISTOR XP4501		R44	1-216-851-11	METAL CHIP 330K	5% 1/16W
Q19	8-729-426-36	TRANSISTOR XP1215-TXE		R45	1-216-855-11	METAL CHIP 680K	5% 1/16W
Q20	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R46	1-216-821-11	METAL CHIP 1K	5% 1/16W
Q301	8-729-800-71	TRANSISTOR 2SB815B7-TB		R47	1-216-823-11	METAL CHIP 1.5K	5% 1/16W
Q302	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R48	1-218-863-11	RES,CHIP 4.7K	0.50% 1/16W
Q303	8-729-426-36	TRANSISTOR XP1215-TXE		R49	1-218-911-11	RES,CHIP 470K	0.50% 1/16W
Q304	8-729-037-62	TRANSISTOR UN9114J-(TX).SO		R50	1-218-855-11	RES,CHIP 2.2K	0.50% 1/16W
Q305	8-729-426-36	TRANSISTOR XP1215-TXE		R51	1-218-847-11	RES,CHIP 1K	0.50% 1/16W
Q601	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R52	1-218-859-11	RES,CHIP 3.3K	0.50% 1/16W
Q801	8-729-800-37	TRANSISTOR 2SD1048-X7		R53	1-218-859-11	RES,CHIP 3.3K	0.50% 1/16W
Q802	8-729-400-55	TRANSISTOR 2SD1328-S		R54	1-218-859-11	RES,CHIP 3.3K	0.50% 1/16W
Q803	8-729-800-71	TRANSISTOR 2SB815B7-TB		R55	1-218-863-11	RES,CHIP 4.7K	0.50% 1/16W
Q804	8-729-800-71	TRANSISTOR 2SB815B7-TB		R56	1-218-875-11	RES,CHIP 15K	0.50% 1/16W
Q805	8-729-037-71	TRANSISTOR UN9210J-(TX).SO		R58	1-216-833-91	RES,CHIP 10K	5% 1/16W
		< RESISTOR >		R59	1-216-833-91	RES,CHIP 10K	5% 1/16W
R1	1-216-841-11	METAL CHIP 47K	5% 1/16W	R60	1-216-833-91	RES,CHIP 10K	5% 1/16W
R2	1-216-823-11	METAL CHIP 1.5K	5% 1/16W	R61	1-216-833-91	RES,CHIP 10K	5% 1/16W
R3	1-216-809-11	METAL CHIP 100	5% 1/16W	R62	1-216-845-11	METAL CHIP 100K	5% 1/16W
R4	1-216-825-11	METAL CHIP 2.2K	5% 1/16W	R63	1-216-853-11	METAL CHIP 470K	5% 1/16W
R5	1-216-821-11	METAL CHIP 1K	5% 1/16W	R64	1-216-853-11	METAL CHIP 470K	5% 1/16W
R6	1-216-817-11	METAL CHIP 470	5% 1/16W	R65	1-216-849-11	METAL CHIP 220K	5% 1/16W
R7	1-216-845-11	METAL CHIP 100K	5% 1/16W	R66	1-216-839-11	METAL CHIP 33K	5% 1/16W
R8	1-216-853-11	METAL CHIP 470K	5% 1/16W	R67	1-216-839-11	METAL CHIP 33K	5% 1/16W
R9	1-216-817-11	METAL CHIP 470	5% 1/16W	R68	1-216-825-11	METAL CHIP 2.2K	5% 1/16W
R10	1-216-829-11	METAL CHIP 4.7K	5% 1/16W	R69	1-216-825-11	METAL CHIP 2.2K	5% 1/16W
R11	1-216-833-91	RES,CHIP 10K	5% 1/16W	R70	1-218-895-11	RES,CHIP 100K	0.50% 1/16W
R12	1-216-833-91	RES,CHIP 10K	5% 1/16W	R71	1-218-851-11	RES,CHIP 1.5K	0.50% 1/16W
R13	1-216-837-11	METAL CHIP 22K	5% 1/16W	R72	1-218-871-11	RES,CHIP 10K	0.50% 1/16W
R14	1-216-845-11	METAL CHIP 100K	5% 1/16W	R73	1-218-831-11	RES,CHIP 220	0.50% 1/16W
R15	1-216-833-91	RES,CHIP 10K	5% 1/16W	R74	1-218-875-11	RES,CHIP 15K	0.50% 1/16W
R16	1-216-853-11	METAL CHIP 470K	5% 1/16W	R75	1-218-839-11	RES,CHIP 470	0.50% 1/16W
R17	1-216-821-11	METAL CHIP 1K	5% 1/16W	R76	1-218-875-11	RES,CHIP 15K	0.50% 1/16W
R18	1-216-849-11	METAL CHIP 220K	5% 1/16W	R77	1-216-829-11	METAL CHIP 4.7K	5% 1/16W
R19	1-216-829-11	METAL CHIP 4.7K	5% 1/16W	R101	1-216-823-11	METAL CHIP 1.5K	5% 1/16W
R20	1-216-821-11	METAL CHIP 1K	5% 1/16W	R102	1-216-837-11	METAL CHIP 22K	5% 1/16W
R21	1-216-829-11	METAL CHIP 4.7K	5% 1/16W	R103	1-216-789-11	METAL CHIP 2.2	5% 1/16W
R22	1-216-845-11	METAL CHIP 100K	5% 1/16W	R104	1-216-827-11	METAL CHIP 3.3K	5% 1/16W
R23	1-216-821-11	METAL CHIP 1K	5% 1/16W	R105	1-216-823-11	METAL CHIP 1.5K	5% 1/16W
R24	1-216-821-11	METAL CHIP 1K	5% 1/16W	R106	1-216-811-11	METAL CHIP 150	5% 1/16W
R25	1-216-845-11	METAL CHIP 100K	5% 1/16W	R106	1-216-821-11	METAL CHIP 1K	5% 1/16W (US,AEP,CET)
							(FR)
				R107	1-216-837-11	METAL CHIP 22K	5% 1/16W
				R108	1-216-811-11	METAL CHIP 150	5% 1/16W

