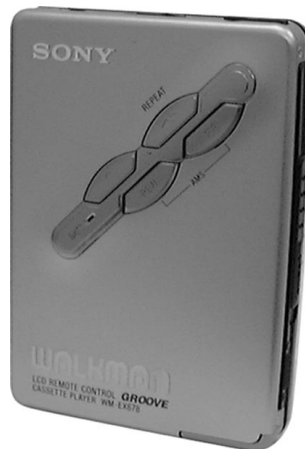


# WM-EX678

## SERVICE MANUAL

*AEP Model*  
*UK Model*

Ver 1.0 1999 . 01



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|                                    |                |
|------------------------------------|----------------|
| Model Name Using Similar Mechanism | NEW            |
| Tape Transport Mechanism Type      | MT-WMEX672-162 |

### SPECIFICATIONS

#### Tape section

Frequency response  
(Dolby NR off)  
Output

Playback : 30 – 18,000 Hz  
Headphones (REMOTE  $\square$  jack)  
Load impedance 8 – 300  $\Omega$

#### General

Power requirements

1.5 V  
One rechargeable battery or one R6 (size AA)  
battery

Dimensions (w/h/d)

Approx. 77.7 × 109.1 × 21.4 mm  
(3<sup>1</sup>/<sub>8</sub> × 4<sup>3</sup>/<sub>8</sub> × 27<sup>1</sup>/<sub>32</sub> inches), incl.  
projecting parts and controls

#### Mass

Approx. 140 g (5.0 oz.)  
Approx. 205 g (7.3 oz.)  
(incl. rechargeable battery and cassette)

#### Supplied accessories

Battery case (1)  
Stereo earphones with remote control (1)  
Battery charger (1)  
Rechargeable battery  
(NC-6WM, 1.2 V, 600 mAh, Ni-Cd) (1)  
Rechargeable battery carrying case (1)  
Carrying pouch (1)

Design and specification subject to change without notice.



CASSETTE PLAYER  
**SONY**®

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### 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.

### 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.

# SECTION 1 SERVICE NOTE

## [Service Mode]

The service mode enables to operate the mechanism of WM-EX678 while the MAIN board is opened.

Rotation of the idler gear (A) (S side) is detected using the photo-reflector (PH701) in the WM-EX678. PH701 is located on the MAIN board, therefore the rotation of the idler gear (A) (S side) cannot be detected by PH701 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 (M901) 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 (S901-1) and the ATS switch (S901-2).
- 4) Connect an AF oscillator to TP53 (P. IN) and TP14 (GND).
- 5) Connect DC 1.3 V from external regulated power supply to ⊕ and ⊖ terminals of the battery.

### 2. PRE-SET status



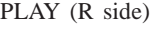
The PLAY, FF and REW modes can be entered only from the PRE-SET status.

- 1) Check that the slider (NR) is in the center position (S701), 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 (S701) 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 (S701) 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 TP53 (P. IN) and TP14 (GND). (See illustration below.)
- 3) Press the  switch (S702) to enter the STOP mode.
- 4) Press the  switch (S704) and the  switch (S705).

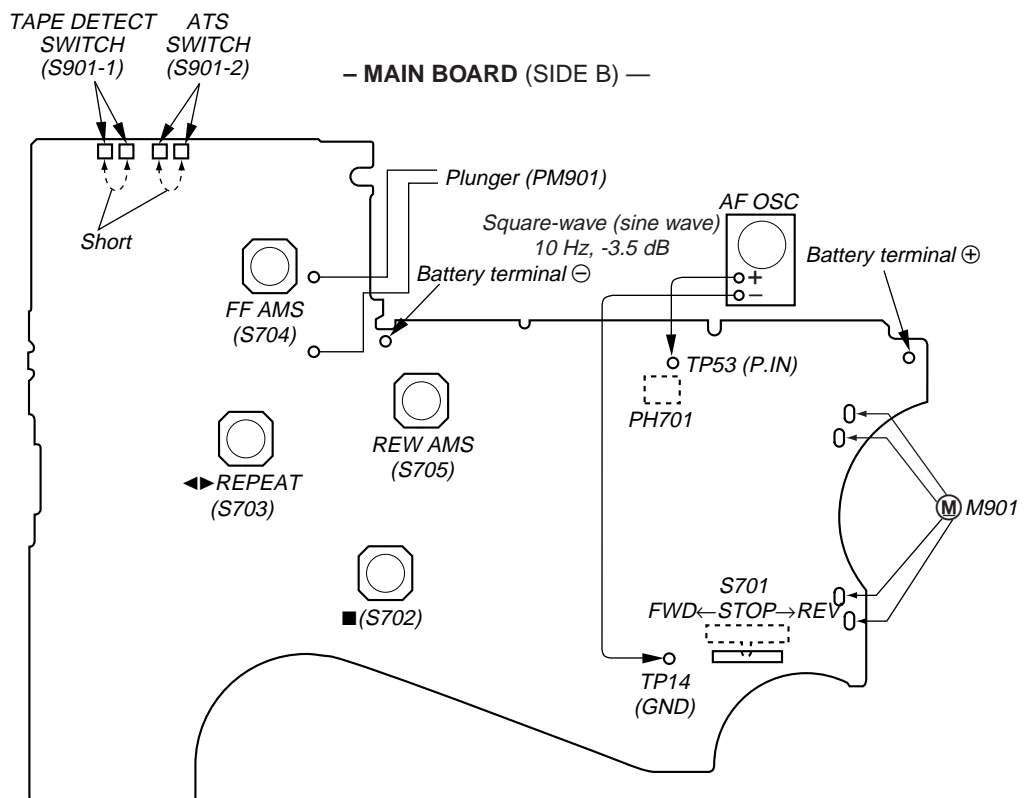
### 4. PLAY mode

- 1) Check that the PRE-SET status is set.
- 2) Connect square wave or sine wave to TP53 (P. IN) and TP14 (GND). (See illustration below.)
- 3) Press the  switch (S702) to enter the stop mode.
- 4) When the  switch (S703) 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 (S701) is pressed in the synchronism with the above timing, the machine can enter the PLAY (R side) mode. Press the  switch (S703) again, and move the FWD/REV switch (S701) in the synchronism with the motion of slider (NR). It enables the machine to enter into the PLAY (F side) mode.

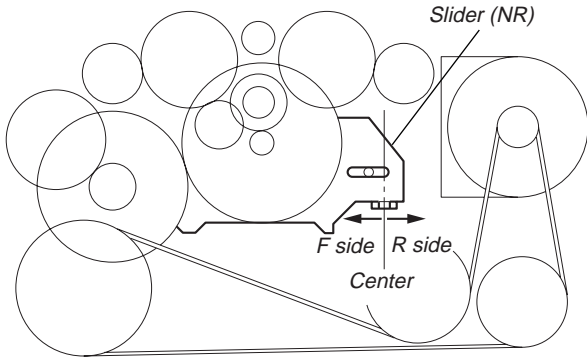
**Note 1:** When you fail to enter the PLAY mode, re-start from step 1) PRE-SET status.

**Note 2:** Regarding the  (S703),  (S702),  (S704), and  (S705) 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 (S701).

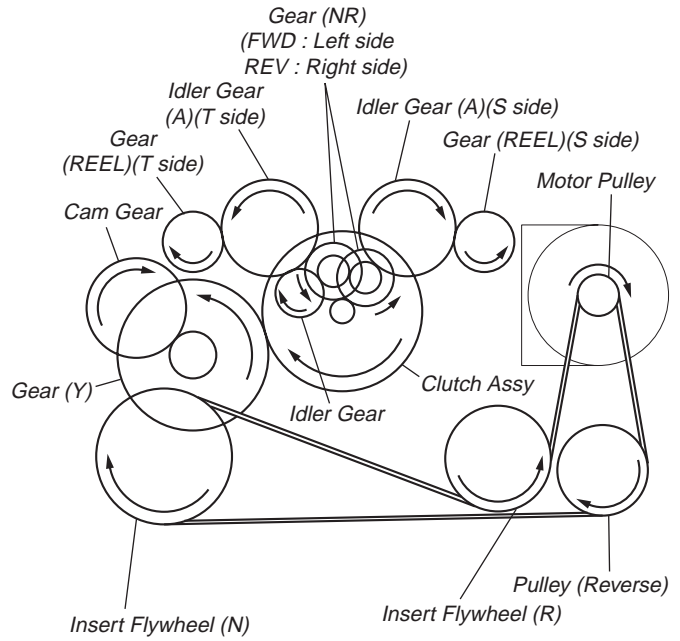


[ Slider (NR) ]

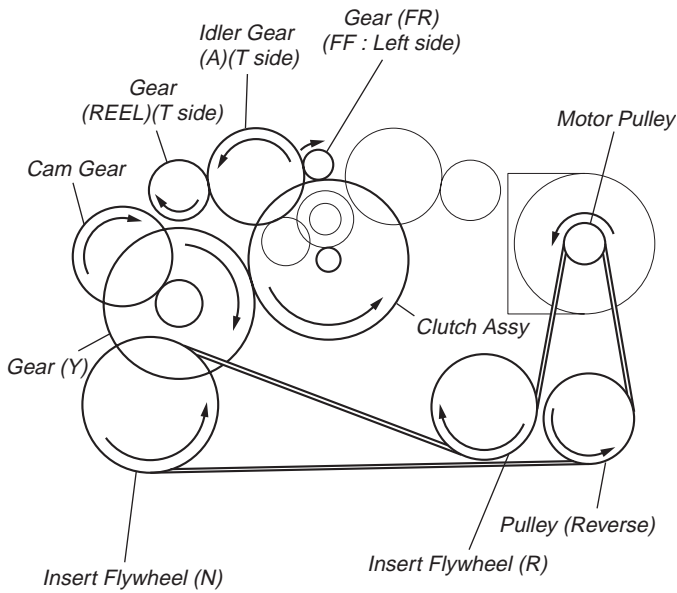


[ Tape drive mechanism ]

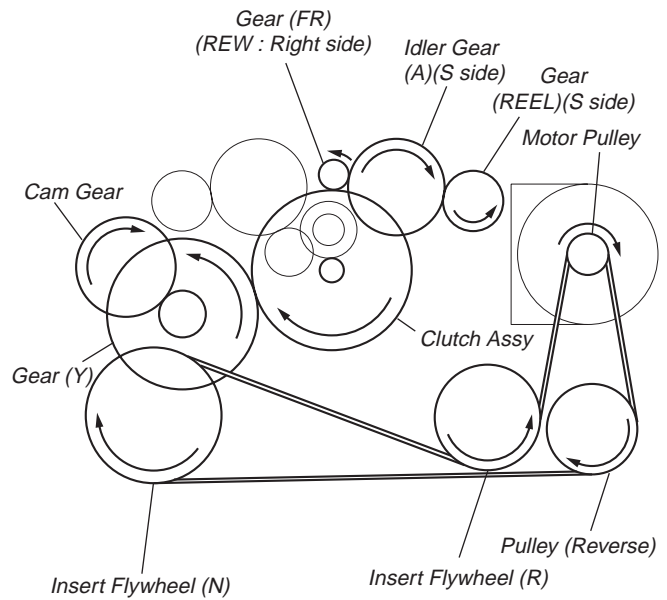
Tape drive mechanism in PLAY mode



Tape drive mechanism in FF mode



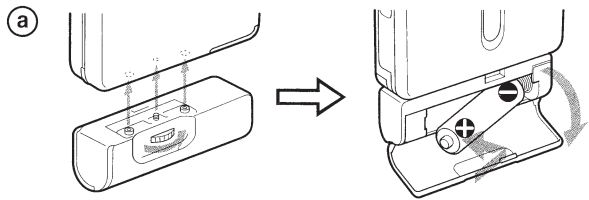
Tape drive mechanism in REW mode



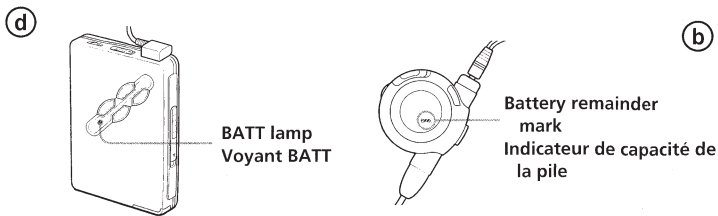
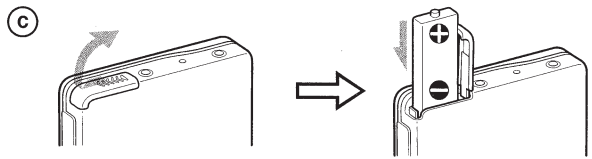
## SECTION 2 GENERAL

This section is extracted from instruction manual.

**A**

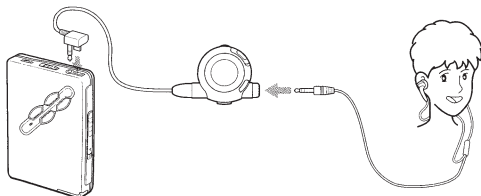


**(b)** UK model  
Modèle pour le Royaume-Uni      Model for other countries  
Modèle pour les autres pays

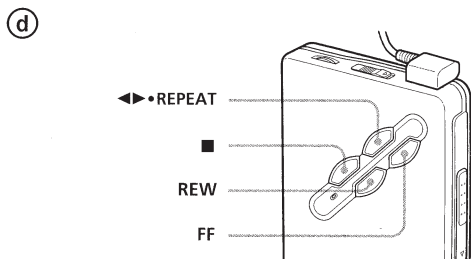
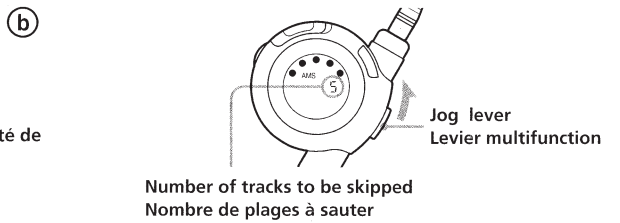
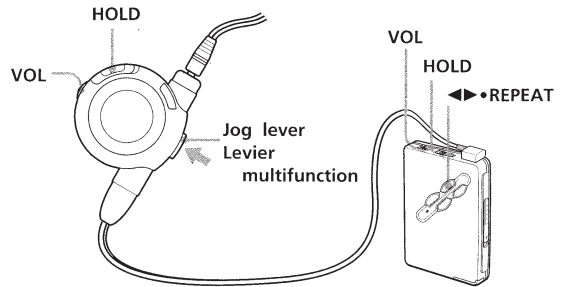
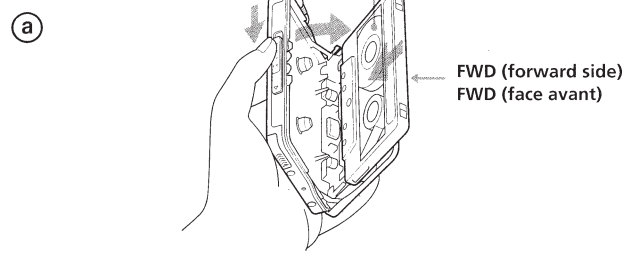


**B**

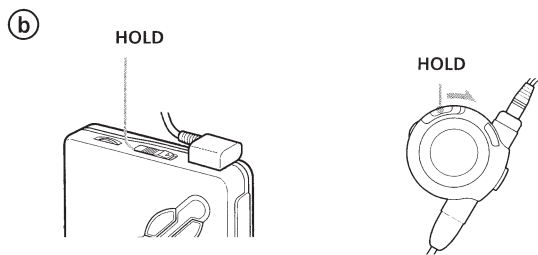
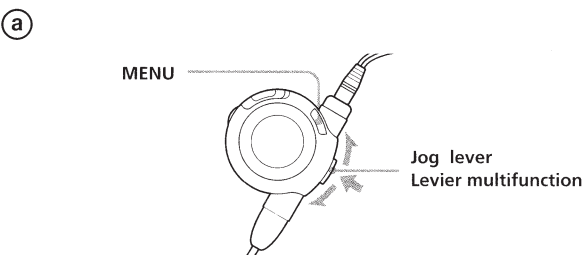
to REMOTE  
A REMOTE



**C**

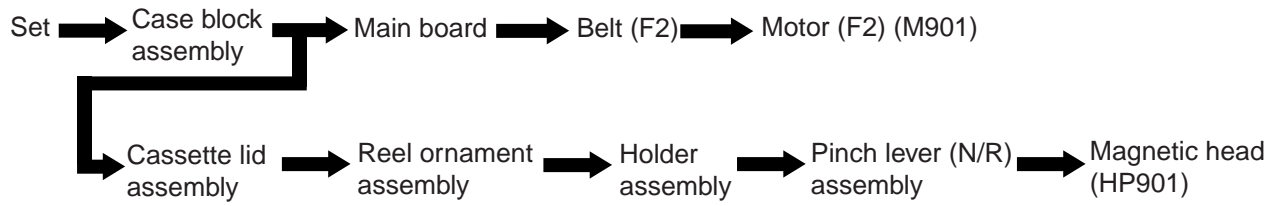


**D**



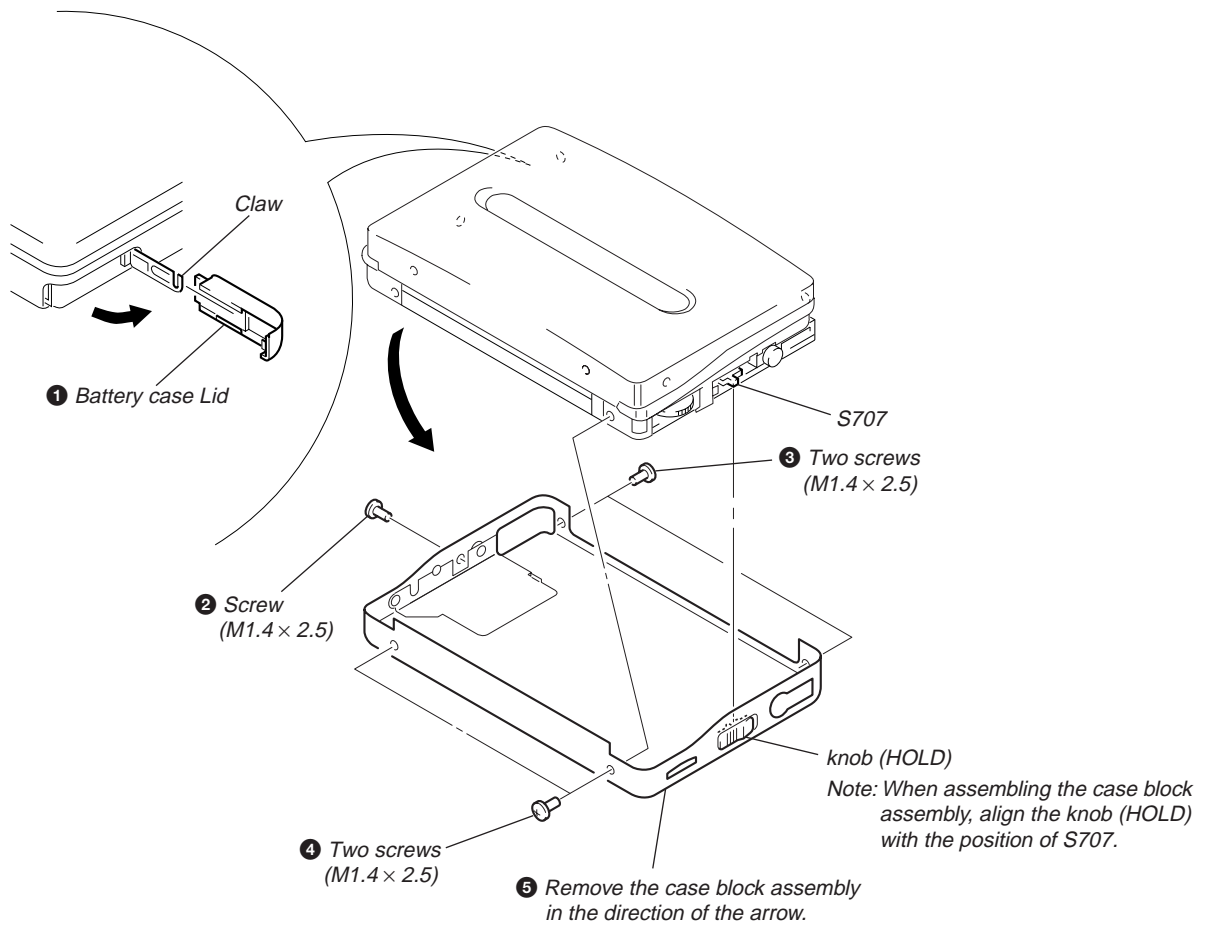
## SECTION 3 DISASSEMBLY

**Note :** Follow the disassembly procedure as shown in the flow chart below.

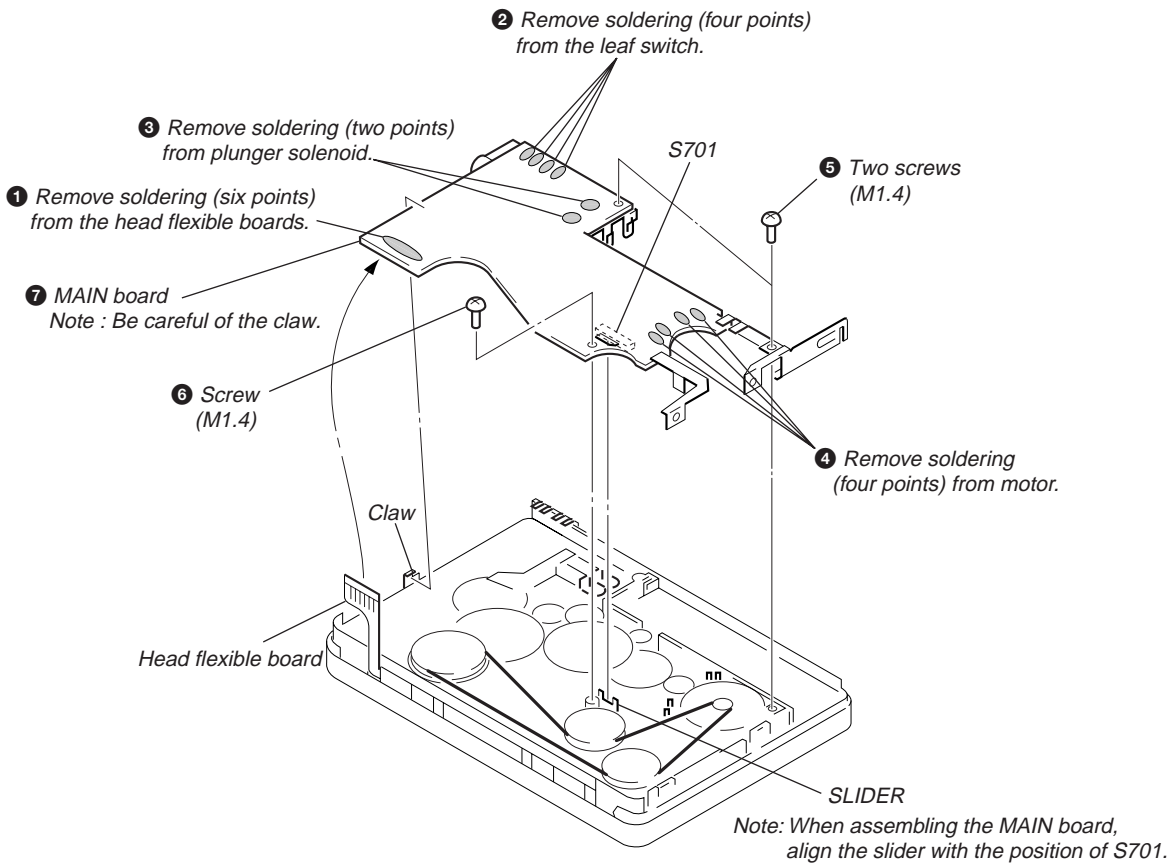


**Note :** Follow the disassembly procedure in the numerical order given.

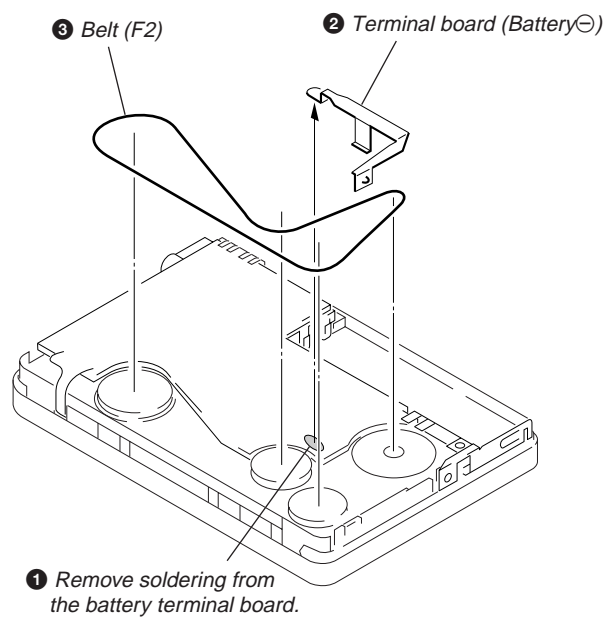
### 3-1. CASE BLOCK ASSEMBLY



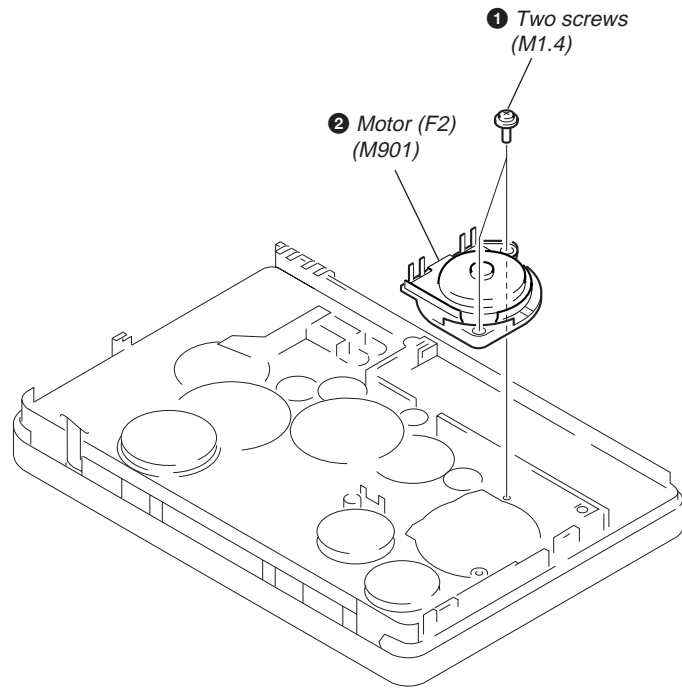
### 3-2. MAIN BOARD



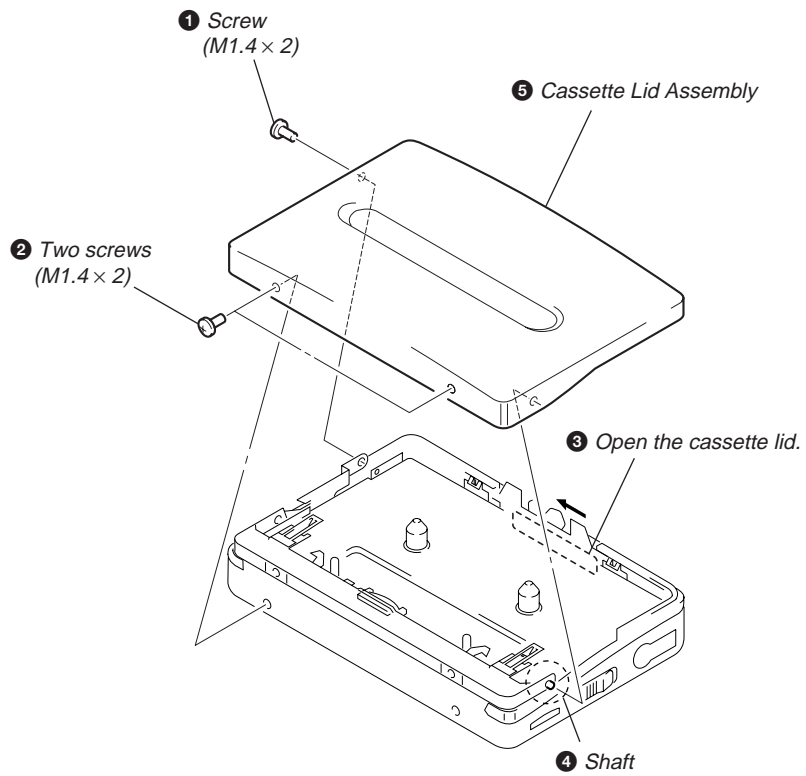
### 3-3. BELT (F2)



### 3-4. MOTOR (F2) (M901)



### 3-5. CASSETTE LID ASSEMBLY

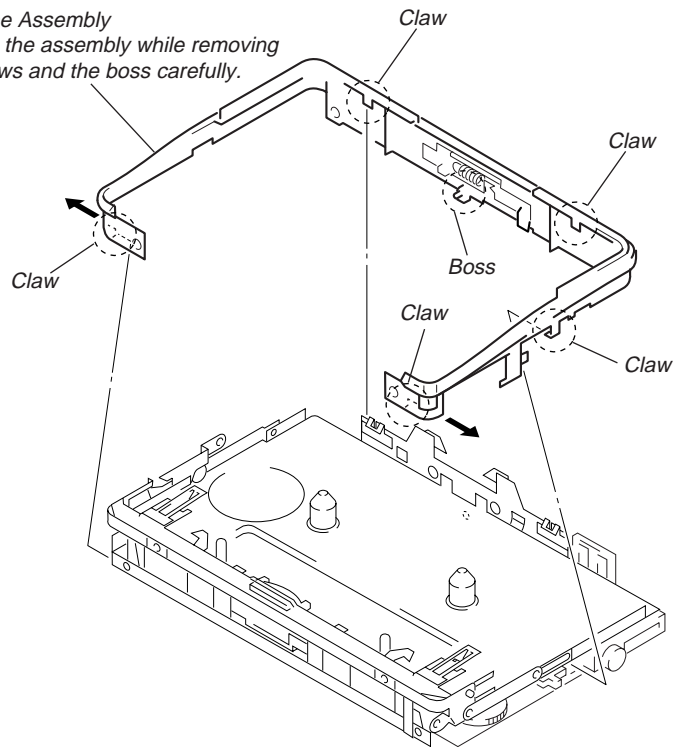




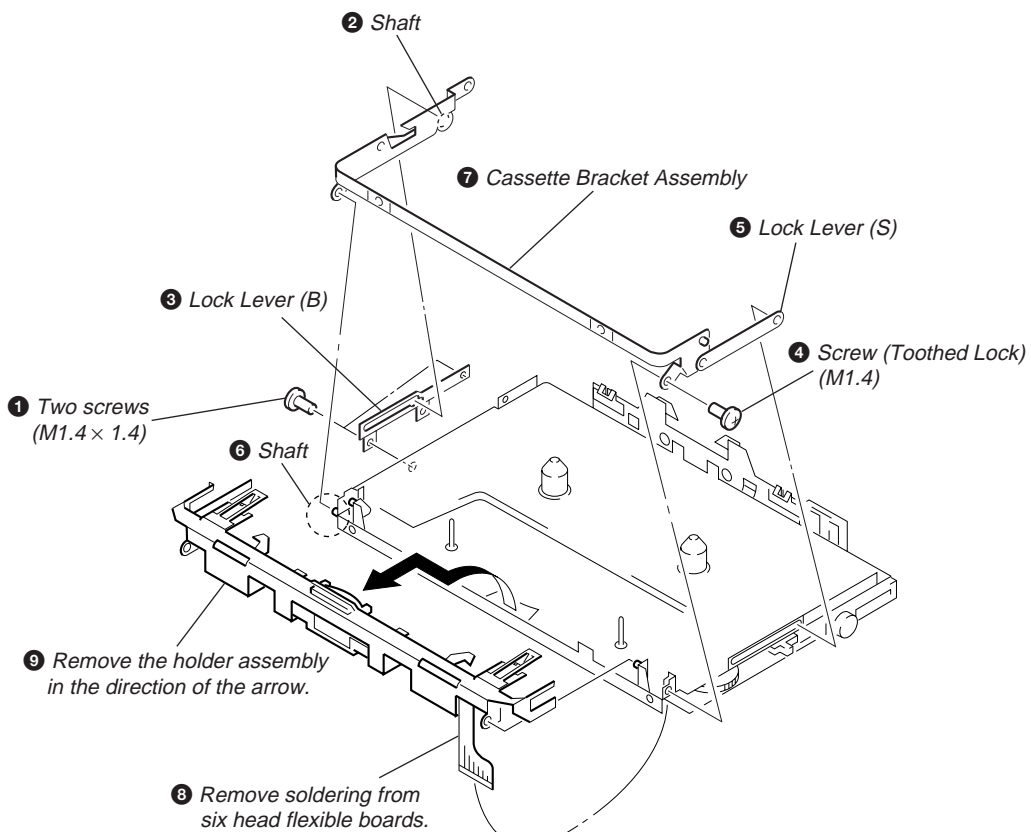
### 3-6. REEL ORNAMENT ASSEMBLY

**1** Reel Ornamene Assembly

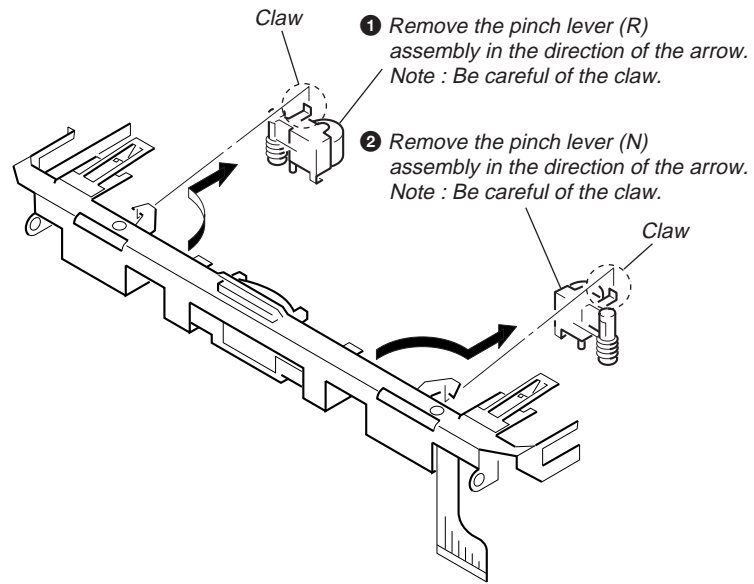
Note : Remove the assembly while removing the 5 claws and the boss carefully.



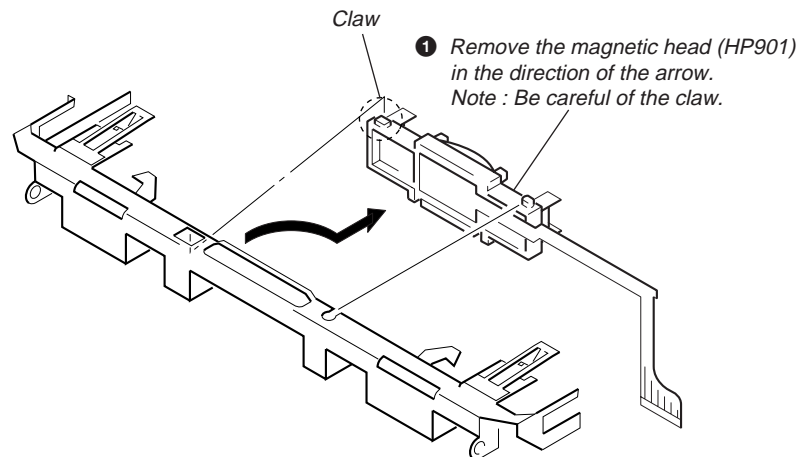
### 3-7. HOLDER ASSEMBLY



### 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-102D      | 16 to 25 g•cm<br>(0.22 to 0.34 oz•inch)       |
| FWD<br>Back Tension | CQ-102D      | 0.5 to 1.5g•cm<br>(0.007 to 0.020 oz•inch)    |
| REW                 | CQ-102C      | 16 to 25 g•cm<br>(0.22 to 0.34 oz•inch)       |
| REW<br>Back Tension | CQ-102C      | 0.5 to 1.5 g•cm<br>(0.007 to 0.020 oz•inch)   |
| FF, REW             | CQ-201B      | More than 50 g•cm<br>(More than 0.69 oz•inch) |

## SECTION 5 ELECTRICAL ADJUSTMENT

### PRECAUTION

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

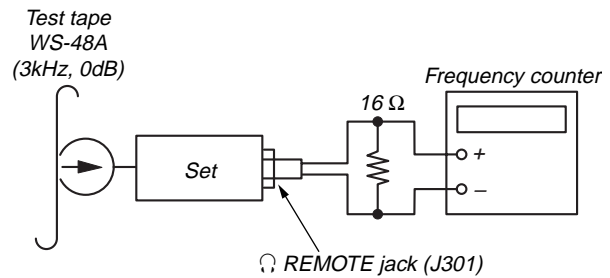
|           |       |
|-----------|-------|
| □□NR      | : OFF |
| AVLS      | : OFF |
| BL SKIP   | : OFF |
| MB/RV GRV | : OFF |

### Test Tape

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

### Tape Speed Adjustment

#### Procedure:



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

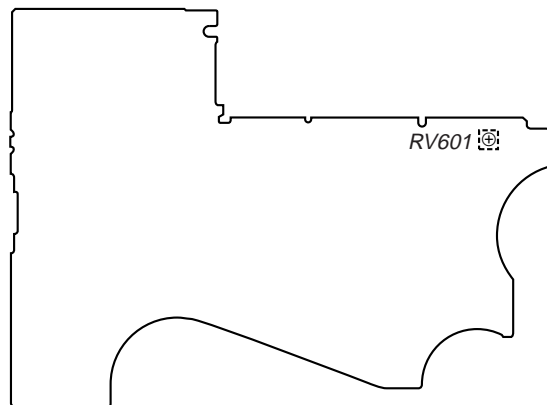
Specification value:

|                     |
|---------------------|
| Frequency counter   |
| 2,970 Hz – 3,030 Hz |

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

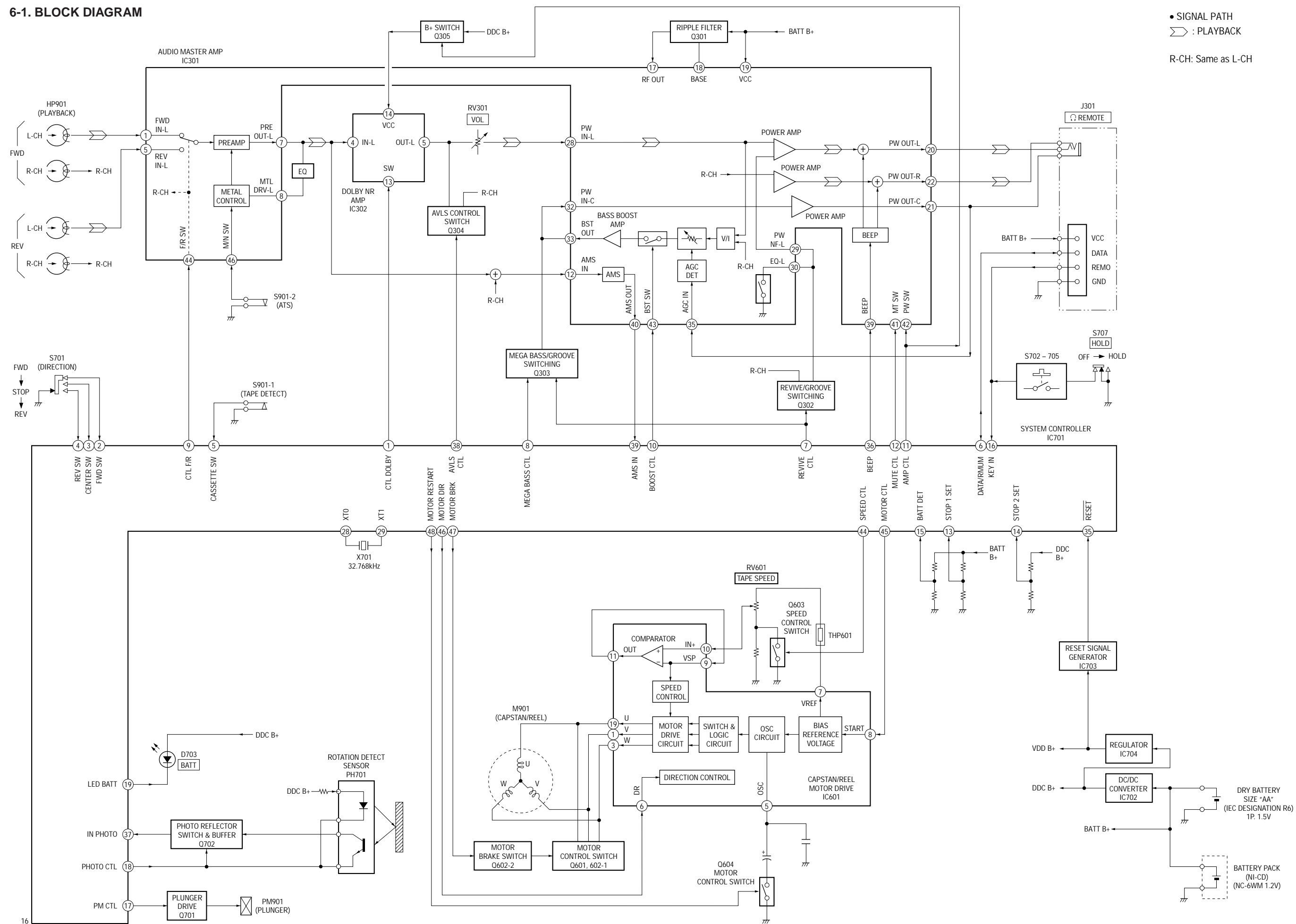
#### Adjustment Point:

[MAIN BOARD] — SIDE B —



SECTION 6  
DIAGRAMS

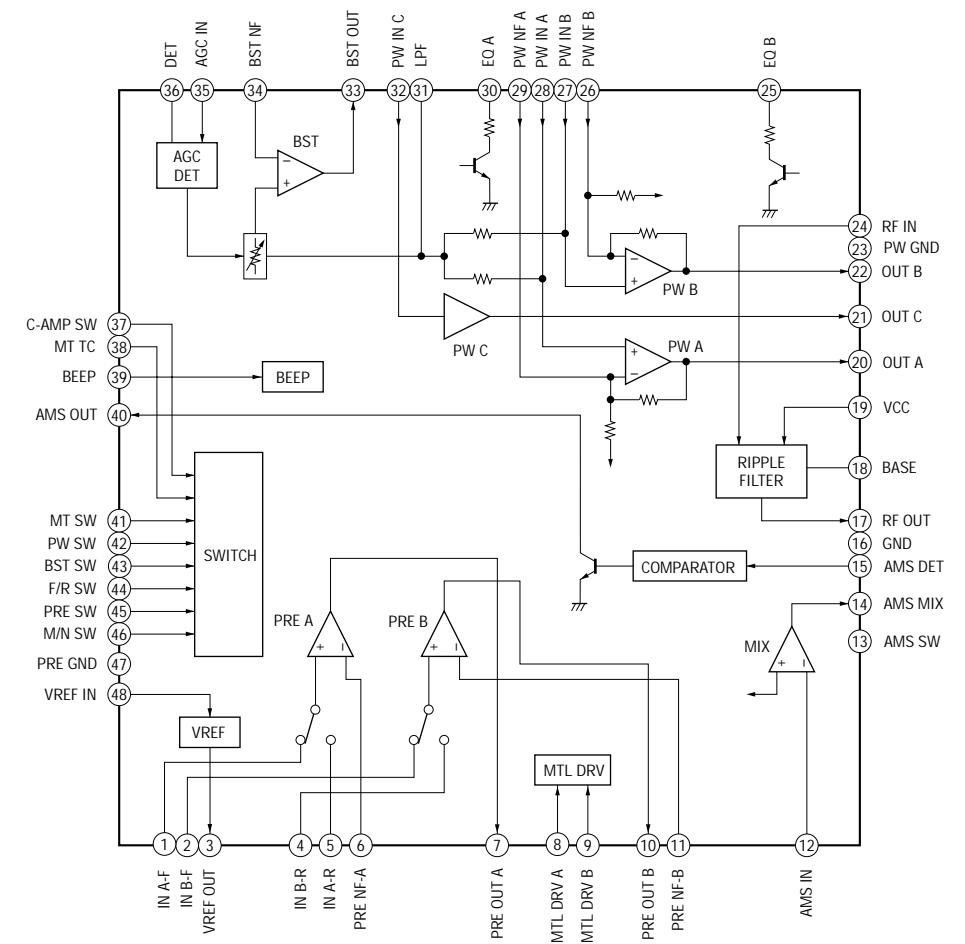
6-1. BLOCK DIAGRAM



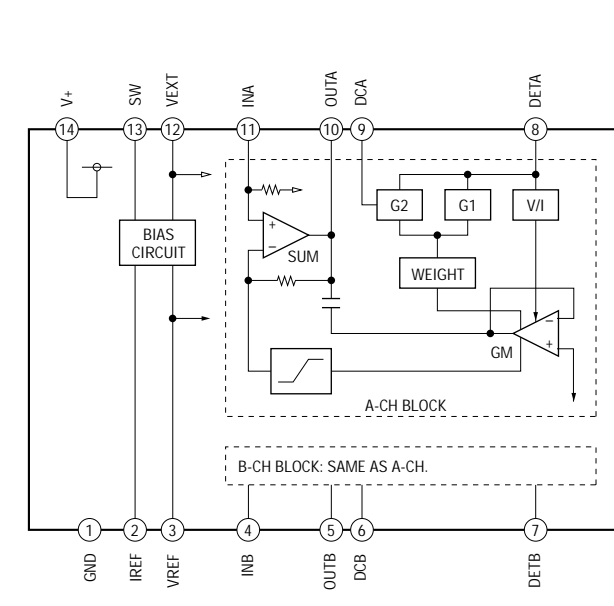
• SIGNAL PATH  
◁ ▷ : PLAYBACK  
R-CH: Same as L-CH

6-2. IC BLOCK DIAGRAMS

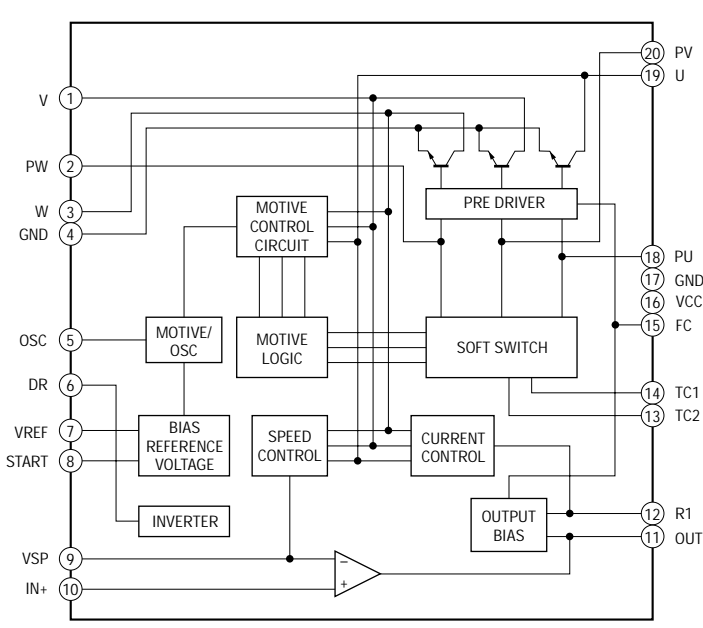
IC301 TA2123F (EL)



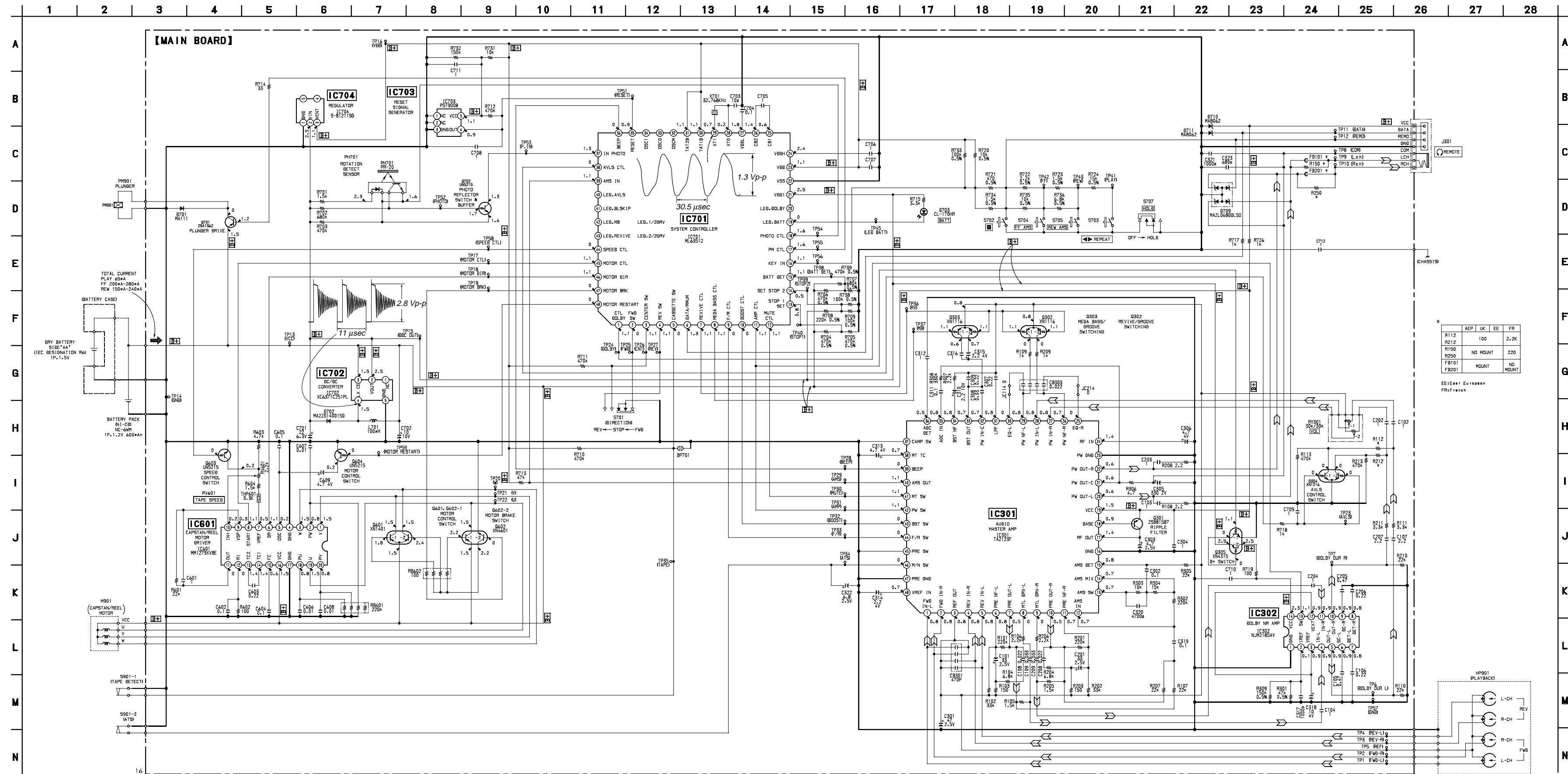
IC302 NJM2185AV-TE2



IC601 MM1279XVBE



6-4. SCHEMATIC DIAGRAM



- $\square$  : B+ Line.
- $\square$  : adjustment for repair.
- Power voltage is dc 1.5V and fed with regulated dc power supply from battery terminal. no mark : PB
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Signal path.
- $\Sigma$  : PB
- Abbreviation  
FR : French  
EE : East European

SECTION 7  
EXPLODED VIEWS

## 6-5. IC PIN FUNCTION

## • MAIN BOARD IC701 ML63512-119TBZ060 (SYSTEM CONTROL)

| Pin No. | Pin Name      | I/O | Description   |
|---------|---------------|-----|---|
| 1       | CTL DOLBY     | O   | Dolby ON/OFF control signal output to Dolby NR amplifier (IC302)<br>“L”: Dolby NR, ON, H: Dolby NR OFF  |
| 2       | FWD SW        | I   | Detection switch (S701) input terminal “L”: FWD   |
| 3       | CENTER SW     | I   | Detection switch (S701) input terminal “L”: CENTER  |
| 4       | REV SW        | I   | Detection switch (S701) input terminal “L”: REV   |
| 5       | CASSETTE SW   | I   | Cassette detection switch (S901-1) input terminal<br>“L”: with cassette “H”: without cassette   |
| 6       | DATA/RMUM     | I/O | Serial data output of communication with the remote commander having phone, and the remote control sensing signal input from remote commander having phone                                  |
| 7       | REVIVE CTL    | O   | Tone selection signal output to TA2123F (IC301)<br>“L”: REVIVE “H”: OFF/MEGA BASS/GROOVE  |
| 8       | MEGA BASS CTL | O   | Tone selection signal output to TA2123F (IC301)<br>“L”: MEGA BASS “H”: OFF/REVIVE/GROOVE  |
| 9       | F/R CTL       | O   | FWD/REV selection signal output to TA2123F (IC301) “L”: FWD “H”: REV  |
| 10      | BOOST CTL     | O   | Bass boost control signal output to TA2123F (IC301) “L”: OFF “H”: ON  |
| 11      | AMP CTL       | O   | Power supply ON/OFF control signal output to TA2123F (IC301)<br>“L”: power supply OFF “H”: power supply ON<br>(The power supply ON/OFF control of Dolby NR amplifier (IC302) is performed.) |
| 12      | MUTE CTL      | O   | Power mute control signal output to TA2123F (IC301)<br>“L”: mute ON “H”: mute OFF   |
| 13      | SET STOP1     | I   | Battery voltage detection input terminal when the machine is stopped. (A/D input)   |
| 14      | SET STOP2     | I   | Reference voltage input terminal when the machine is stopped. (A/D input)   |
| 15      | BATT DET      | I   | Battery voltage detection input terminal (A/D input)  |
| 16      | KEY IN        | I   | Key input terminal (A/D input)  |
| 17      | PM CTL        | O   | Plunger drive signal output “L”: plunger ON   |
| 18      | PHOTO CTL     | O   | Control signal output to the rotation detection circuit of the capstan/reel motor<br>“L”: rotation detection circuit ON   |
| 19      | LED BATT      | O   | LED (D703) drive signal output to BATT display “L”: LED ON  |
| 20      | LED DOLBY     | O   | Drive signal output to DOLBY display Not used in this machine (empty terminal)  |
| 21      | VDD1          | -   | Power supply terminal for external interface (+2.5 V)   |
| 22      | VSS           | -   | Ground terminal   |
| 23      | VDD           | -   | Power supply terminal (+1.5 V)  |
| 24      | VDDH          | -   | Step-up power supply terminal for back-up   |
| 25      | CB1           | -   | Terminal to which condenser for step-up power supply is connected   |
| 26      | CB2           | -   | Terminal to which condenser for step-up power supply is connected   |
| 27      | VDDL          | -   | Power supply terminal for internal logic  |
| 28      | XT0           | -   | Terminal to which main system clock is connected (32.768 kHz)   |
| 29      | XT1           | -   | Terminal to which main system clock is connected (32.768 kHz)   |
| 30      | TAT1B         | I   | Test input terminal Normally, fixed to “H”.   |
| 31      | TAT2B         | I   | Test input terminal Normally, fixed to “H”.   |
| 32      | OSCM          | -   | Terminal to which external capacitor for oscillation is connected Not used in this machine (empty terminal)   |
| 33      | OSC0          | I   | Terminal to which resistance for high-speed CR oscillation (800 kHz) is connected Not used in this machine (empty terminal)   |
| 34      | OSC1          | O   | Terminal to which resistance for high-speed CR oscillation (800 kHz) is connected Not used in this machine (empty terminal)   |
| 35      | RESET         | I   | System reset signal input from the reset signal generator (IC703) “L”: reset<br>“L” is input for several hundreds msec after power supply starts up, then “H” is input.                     |
| 36      | BEEP          | O   | Beep sound output to TA2123F (IC301)  |
| 37      | IN PHOTO      | I   | Rotation detection input of capstan/reel motor (M901)   |
| 38      | AVLS CTL      | O   | AVLD ON/OFF control signal output “L”: AVLS OFF, “H”: AVLS ON   |

| Pin No. | Pin Name      | I/O | Description   |
|---------|---------------|-----|---|
| 39      | AMS IN        | I   | AMS detection signal input from TA2123F (IC301) “H”: No music   |
| 40      | LED AVLS      | O   | Drive signal output for AVLS display Not used in this machine (empty terminal)  |
| 41      | LED BLSKIP    | O   | Drive signal output for BL SKIP display Not used in this machine (empty terminal)   |
| 42      | LED MB        | O   | Drive signal output for MG GRV display Not used in this machine (empty terminal)  |
| 43      | LED REVIVE    | O   | Drive signal output for RV GRV display Not used in this machine (empty terminal)  |
| 44      | SPEED CTL     | O   | Motor speed control signal output to capstan/reel motor drive IC (IC601)<br>“L”: normal “H”: half speed                     |
| 45      | MOTOR CTL     | O   | Motor start control signal output to capstan/reel motor drive IC (IC601)<br>“H”: motor ON                                   |
| 46      | MOTOR DIR     | O   | Motor direction control signal output to capstan/reel motor drive IC (IC601)<br>“L”: clockwise “H”: counter-clockwise       |
| 47      | MOTOR BRK     | O   | Motor brake ON/OFF control signal output to capstan/reel motor drive IC (IC601)<br>“H”: brake ON (Normally “L” is input.)   |
| 48      | MOTOR RESTART | O   | Signal output for motor start-up status control to capstan/reel motor drive IC (IC601)<br>“H”: during FF/REW motor rotating |

## NOTE:

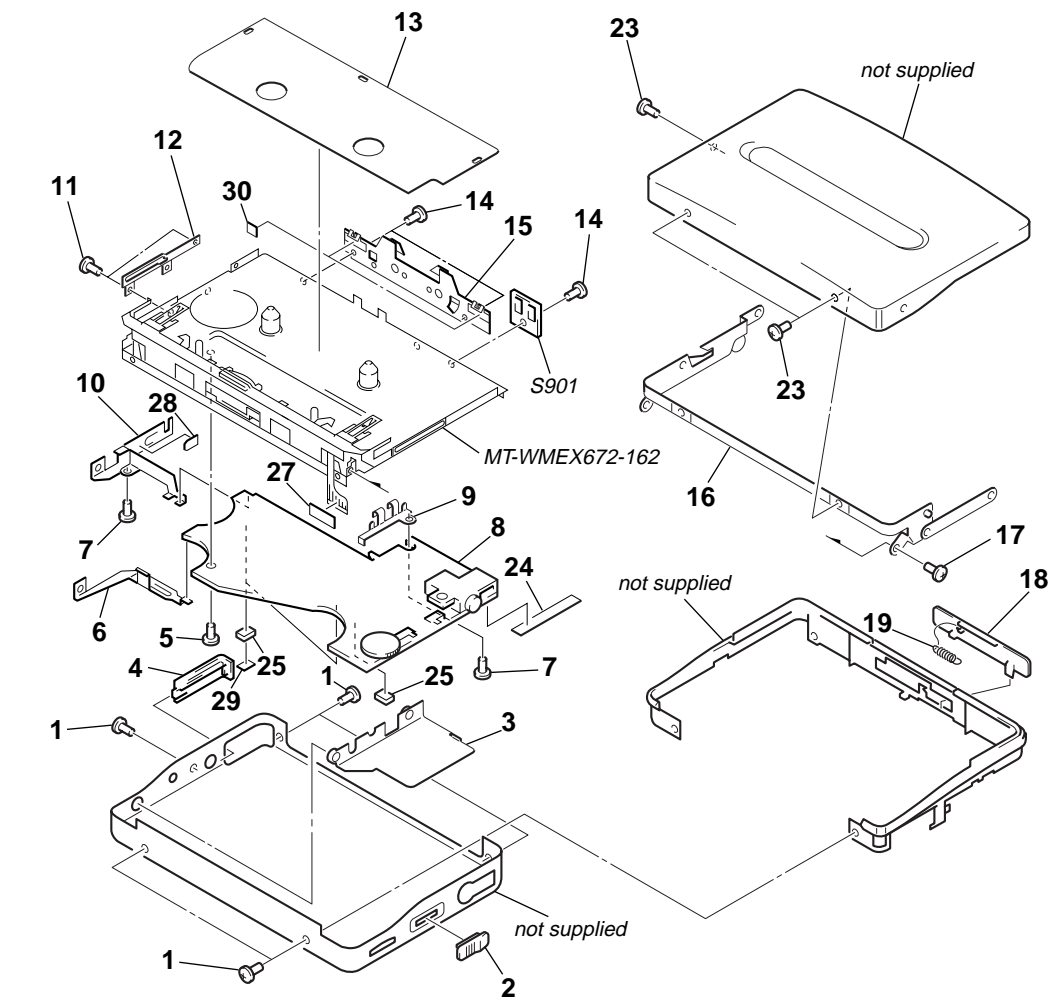
- XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:  
KNOB, BALANCE (WHITE) . . . (RED)

Parts of Color Cabinet's Color

- The mechanical parts with no reference number in the exploded views are not supplied.
- Abbreviation  
FR : French  
EE : East European

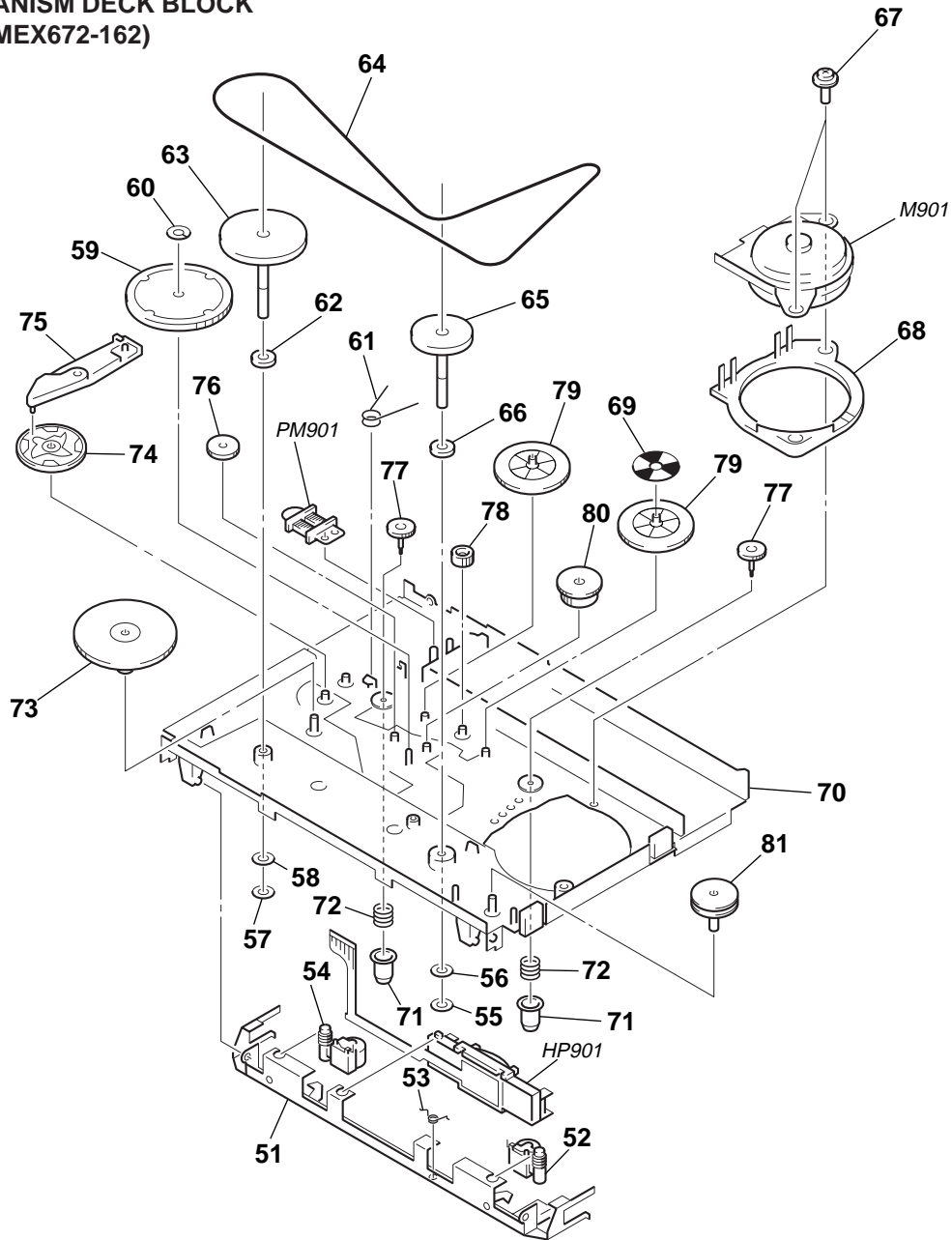
When indicating parts by reference number, please include the board name.

## 7-1. CABINET BLOCK, MAIN BOARD



| Ref. No. | Part No.     | Description                          | Remarks     | Ref. No. | Part No.     | Description                          | Remarks     |
|----------|--------------|--------------------------------------|-------------|----------|--------------|--------------------------------------|-------------|
| 1        | 3-704-197-21 | SCREW (M1.4 × 2.5), LOCKING (SILVER) |             | 13       | 3-029-205-31 | MD COVER                             |             |
| 1        | 3-704-197-23 | SCREW (M1.4 × 2.5), LOCKING (BLACK)  | (AEP,FR,EE) | 14       | 3-366-892-01 | SCREW (M1.4)                         |             |
| 2        | 3-029-230-01 | KNOB (HOLD)                          |             | 15       | X-3376-277-1 | BRACKET ASSY                         |             |
| 3        | 3-029-227-01 | PLATE (TERMINAL), ORNAMENTAL         |             | 16       | X-3376-279-1 | BRACKET (CASSETTE) ASSY              |             |
| 4        | 3-029-233-51 | LID, BATTERY CASE (SILVER)           |             | 17       | 3-365-630-41 | SCREW (M1.4)                         |             |
| 4        | 3-029-233-61 | LID, BATTERY CASE (BLACK)(AEP,FR,EE) |             | 18       | 3-029-219-01 | KNOB (OPEN)                          |             |
| 5        | 3-345-648-71 | SCREW (M1.4), TOOTHED LOCK           |             | 19       | 3-029-220-01 | SPRING, TENSION                      |             |
| 6        | 3-029-213-01 | TERMINAL BOARD                       |             | 23       | 3-704-197-11 | SCREW (M1.4 × 2.0), LOCKING (SILVER) |             |
| 7        | 3-375-114-41 | SCREW                                |             | 23       | 3-704-197-13 | SCREW (M1.4 × 2.0), LOCKING (BLACK)  | (AEP,FR,EE) |
| 8        | A-3021-172-A | MAIN BOARD, COMPLETE (AEP,UK,EE)     |             | 24       | 3-032-323-01 | PAPER (A), SHIELD                    |             |
| 8        | A-3021-173-A | MAIN BOARD, COMPLETE (FR)            |             | 25       | 3-032-805-01 | SHEET (T1.6)                         |             |
| 9        | 3-029-210-01 | TERMINAL BOARD (MINUS)               |             | 27       | 3-309-595-11 | SHEET, INSULATING, PACK              |             |
| 10       | X-3376-278-1 | TERMINAL BOARD ASSY, BATTERY         |             | 28       | 3-031-460-01 | SHEET (BT)                           |             |
| 11       | 3-366-892-11 | SCREW (M1.4 × 1.4)                   |             | 29       | 3-032-905-01 | CUSHION (TO.4)                       |             |
| 12       | 3-029-217-01 | LEVER (B), LOCK                      |             | 30       | 3-328-483-11 | SHEET                                |             |
|          |              |                                      |             | 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)            |         | 68       | 3-029-274-01 | RETAINER (F2), MOTOR               |         |
| 52       | X-3376-295-1 | PINCH LEVER (R) ASSY       |         | 69       | 3-007-433-01 | SHEET (N), REFLECTION              |         |
| 53       | 3-029-271-01 | SPRING (HD)                |         | 70       | X-3377-037-1 | CHASSIS ASSY (F) (M)               |         |
| 54       | X-3376-294-1 | PINCH LEVER (N) ASSY       |         | 71       | 3-010-274-02 | TABLE, REEL                        |         |
| 55       | 3-029-275-01 | WASHER (STOPPER N)         |         | 72       | 3-010-954-01 | SPRING (BT), COMPRESSION           |         |
| 56       | 3-029-278-01 | WASHER                     |         | 73       | 3-029-282-01 | GEAR (Y)                           |         |
| 57       | 3-029-276-01 | WASHER (STOPPER R)         |         | 74       | 3-029-285-01 | GEAR, CAM                          |         |
| 58       | 3-029-289-01 | WASHER                     |         | 75       | 3-029-284-01 | LEVER, TRIGGER                     |         |
| 59       | X-3376-813-1 | CLUTCH ASSY (F)            |         | 76       | 3-029-281-01 | GEAR, IDLER (B)                    |         |
| 60       | 3-932-724-21 | WASHER                     |         | 77       | 3-010-273-02 | GEAR (REEL)                        |         |
| 61       | 3-029-287-01 | SPRING (TG), TORSION       |         | 78       | 3-029-273-01 | GEAR (FR)                          |         |
| 62       | 3-386-694-01 | WASHER                     |         | 79       | 3-029-283-01 | GEAR, IDLER (A)                    |         |
| 63       | 3-029-306-11 | FLYWHEEL (N), INSERT       |         | 80       | 3-029-286-01 | GEAR (NR)                          |         |
| 64       | 3-029-280-01 | BELT (F2)                  |         | 81       | 3-029-288-01 | PULLEY, REVERSE                    |         |
| 65       | 3-029-268-11 | FLYWHEEL (R), INSERT       |         | HP901    | 1-500-576-11 | HEAD, MAGNETIC (PLAYBACK)          |         |
| 66       | 3-007-428-01 | WASHER (R)                 |         | M901     | 1-763-166-11 | MOTOR (CAPSTAN/REEL) (WITH PULLEY) |         |
| 67       | 3-029-765-01 | SCREW (M1.4), TOOTHED LOCK |         | PM901    | 1-454-674-32 | SOLENOID, PLUNGER                  |         |

## SECTION 8 ELECTRICAL PARTS LIST

**NOTE:**

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -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:  $\mu$ F
- RESISTORS  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS  
uH:  $\mu$ H
- Abbreviation  
FR : French  
EE : East European

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

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

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

| Ref. No. | Part No.     | Description                               | Remarks  | Ref. No. | Part No.     | Description                   | Remarks   |
|----------|--------------|---|----------|----------|--------------|-------------------------------|-----------|
|          | A-3021-172-A | MAIN BOARD, COMPLETE (AEP,UK,EE)<br>***** |          | C323     | 1-115-412-11 | CERAMIC CHIP 680PF            | 5% 25V    |
|          | A-3021-173-A | MAIN BOARD, COMPLETE (FR)<br>*****        |          | C601     | 1-125-837-91 | CERAMIC CHIP 1uF              | 10% 6.3V  |
|          |              | < CAPACITOR >                             |          | C602     | 1-107-826-91 | CERAMIC CHIP 0.1uF            | 10% 16V   |
| C101     | 1-107-520-11 | TANTAL. CHIP 33uF                         | 20% 2.5V | C603     | 1-115-467-11 | CERAMIC CHIP 0.22uF           | 10% 10V   |
| C102     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C604     | 1-164-156-11 | CERAMIC CHIP 0.1uF            | 25V       |
| C103     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C605     | 1-107-826-91 | CERAMIC CHIP 0.1uF            | 10% 16V   |
| C104     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C606     | 1-162-970-11 | CERAMIC CHIP 0.01uF           | 10% 25V   |
| C105     | 1-113-619-11 | CERAMIC CHIP 0.47uF                       | 10% 6.3V | C607     | 1-162-970-11 | CERAMIC CHIP 0.01uF           | 10% 25V   |
| C106     | 1-115-467-11 | CERAMIC CHIP 0.22uF                       | 10% 10V  | C608     | 1-162-970-11 | CERAMIC CHIP 0.01uF           | 10% 25V   |
| C107     | 1-164-505-11 | CERAMIC CHIP 2.2uF                        | 16V      | C609     | 1-135-151-21 | TANTALUM CHIP 4.7uF           | 20% 4V    |
| C108     | 1-164-227-11 | CERAMIC CHIP 0.022uF                      | 10% 25V  | C701     | 1-119-750-11 | TANTAL. CHIP 22uF             | 20% 6.3V  |
| C109     | 1-164-677-11 | CERAMIC CHIP 0.033uF                      | 10% 16V  | C702     | 1-104-851-11 | TANTAL. CHIP 10uF             | 20% 10V   |
| C201     | 1-107-520-11 | TANTAL. CHIP 33uF                         | 20% 2.5V | C703     | 1-162-915-11 | CERAMIC CHIP 10PF             | 0.5PF 50V |
| C202     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C704     | 1-107-826-91 | CERAMIC CHIP 0.1uF            | 10% 16V   |
| C203     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C705     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C204     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | C706     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C205     | 1-113-619-11 | CERAMIC CHIP 0.47uF                       | 10% 6.3V | C707     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C206     | 1-115-467-11 | CERAMIC CHIP 0.22uF                       | 10% 10V  | C708     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C207     | 1-164-505-11 | CERAMIC CHIP 2.2uF                        | 16V      | C709     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C208     | 1-164-227-11 | CERAMIC CHIP 0.022uF                      | 10% 25V  | C710     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C209     | 1-164-677-11 | CERAMIC CHIP 0.033uF                      | 10% 16V  | C711     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C301     | 1-119-663-11 | TANTAL. CHIP 47uF                         | 20% 2.5V | C712     | 1-115-156-11 | CERAMIC CHIP 1uF              | 10V       |
| C302     | 1-164-156-11 | CERAMIC CHIP 0.1uF                        | 25V      |          |              | < COMPOSITION CIRCUIT BLOCK > |           |
| C303     | 1-117-181-11 | TANTAL. CHIP 4.7uF                        | 20% 2.5V | CB301    | 1-127-575-21 | CERAMIC CHIP 470PF            | 0 50V     |
| C304     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      | CB303    | 1-127-576-21 | CERAMIC CHIP 22000PF          | 0 50V     |
| C305     | 1-126-236-11 | ELECT 330uF                               | 20% 2V   |          |              | < DIODE >                     |           |
| C306     | 1-109-935-11 | TANTAL. CHIP 4.7uF                        | 20% 4V   | D701     | 8-719-404-50 | DIODE MA111-TX                |           |
| C307     | 1-115-467-11 | CERAMIC CHIP 0.22uF                       | 10% 10V  | D702     | 8-719-072-70 | DIODE MA2ZD14001S0            |           |
| C308     | 1-165-112-11 | CERAMIC CHIP 0.33uF                       | 16V      | D703     | 8-719-067-79 | LED CL-170HR-CD-T-AB (BATT)   |           |
| C309     | 1-115-467-11 | CERAMIC CHIP 0.22uF                       | 10% 10V  | D709     | 8-719-068-83 | DIODE MAZL068D0LS0-TX/L       |           |
| C310     | 1-135-149-21 | TANTALUM CHIP 2.2uF                       | 20% 10V  | D710     | 8-719-422-58 | DIODE MA8062                  |           |
| C311     | 1-164-156-11 | CERAMIC CHIP 0.1uF                        | 25V      | D711     | 8-719-422-58 | DIODE MA8062                  |           |
| C312     | 1-115-156-11 | CERAMIC CHIP 1uF                          | 10V      |          |              | < FERRITE BEAD >              |           |
| C313     | 1-109-935-11 | TANTAL. CHIP 4.7uF                        | 20% 4V   | FB101    | 1-469-125-21 | FERRITE 0uH (AEP,UK,EE)       |           |
| C314     | 1-135-187-21 | TANTAL. CHIP 2.2uF                        | 20% 4V   | FB201    | 1-469-125-21 | FERRITE 0uH (AEP,UK,EE)       |           |
| C315     | 1-135-187-21 | TANTAL. CHIP 2.2uF                        | 20% 4V   |          |              | < IC >                        |           |
| C316     | 1-125-837-91 | CERAMIC CHIP 1uF                          | 10% 6.3V | IC301    | 8-759-549-78 | IC TA2123F(EL)                |           |
| C317     | 1-162-964-11 | CERAMIC CHIP 0.001uF                      | 10% 50V  | IC302    | 8-759-488-80 | IC NJM2185AV-TE2              |           |
| C318     | 1-135-201-11 | TANTALUM CHIP 10uF                        | 20% 4V   | IC601    | 8-759-356-46 | IC MM1279XVBE                 |           |
| C319     | 1-164-156-11 | CERAMIC CHIP 0.1uF                        | 25V      | IC701    | 8-759-580-19 | IC ML63512-119TBZ060          |           |
| C320     | 1-162-968-11 | CERAMIC CHIP 0.0047uF                     | 10% 50V  | IC702    | 8-759-566-77 | IC XC6371C251PL               |           |
| C321     | 1-115-416-11 | CERAMIC CHIP 1000PF                       | 5% 25V   | IC703    | 8-759-430-08 | IC PST9008NL                  |           |
| C322     | 1-109-937-11 | TANTAL. CHIP 6.8uF                        | 20% 2.5V | IC704    | 8-759-280-84 | IC S-81211SG-QA-T1            |           |



| Ref. No. | Part No.     | Description            | Remarks                      | Ref. No. | Part No.     | Description                   | Remarks                     |
|----------|--------------|------------------------|------------------------------|----------|--------------|-------------------------------|-----------------------------|
|          |              | < JACK >               |                              | R211     | 1-216-827-11 | METAL CHIP                    | 3.3K 5% 1/16W               |
| J301     | 1-779-867-81 | JACK (♻️) REMOTE)      |                              | R212     | 1-216-809-11 | METAL CHIP                    | 100 5% 1/16W<br>(AEP,UK,EE) |
|          |              | <JUMPER CHIP>          |                              | R212     | 1-216-825-11 | METAL CHIP                    | 2.2K 5% 1/16W<br>(FR)       |
| JC114    | 1-216-864-11 | METAL CHIP             | 0 5% 1/16W                   | R213     | 1-216-853-11 | METAL CHIP                    | 470K 5% 1/16W               |
| JC214    | 1-216-864-11 | METAL CHIP             | 0 5% 1/16W                   | R250     | 1-216-813-11 | METAL CHIP                    | 220 5% 1/16W<br>(FR)        |
|          |              | < COIL >               |                              | R301     | 1-218-887-11 | RES,CHIP                      | 47K 0.50% 1/16W             |
| L701     | 1-412-032-11 | INDUCTOR CHIP 100uH    |                              | R302     | 1-216-849-11 | METAL CHIP                    | 220K 5% 1/16W               |
|          |              | < PHOTO INTERRUPTER >  |                              | R303     | 1-216-833-11 | METAL CHIP                    | 10K 5% 1/16W                |
| PH701    | 8-749-014-43 | PHOTO PR-20-T          |                              | R304     | 1-216-835-11 | METAL CHIP                    | 15K 5% 1/16W                |
|          |              | < TRANSISTOR >         |                              | R305     | 1-216-837-11 | METAL CHIP                    | 22K 5% 1/16W                |
| Q301     | 8-729-800-71 | TRANSISTOR 2SB815B7-TB |                              | R306     | 1-216-793-11 | RES,CHIP                      | 4.7 5% 1/16W                |
| Q302     | 8-729-423-75 | TRANSISTOR XN1116      |                              | R307     | 1-216-825-11 | METAL CHIP                    | 2.2K 5% 1/16W               |
| Q303     | 8-729-423-75 | TRANSISTOR XN1116      |                              | R308     | 1-216-851-11 | METAL CHIP                    | 330K 5% 1/16W               |
| Q304     | 8-729-421-23 | TRANSISTOR XN1216      |                              | R309     | 1-218-899-11 | RES,CHIP                      | 150K 0.50% 1/16W            |
| Q305     | 8-729-422-18 | TRANSISTOR XN4315      |                              | R601     | 1-216-837-11 | METAL CHIP                    | 22K 5% 1/16W                |
| Q601     | 8-729-403-42 | TRANSISTOR XN1401      |                              | R602     | 1-216-809-11 | METAL CHIP                    | 100 5% 1/16W                |
| Q602     | 8-729-402-84 | TRANSISTOR XN4601      |                              | R603     | 1-216-829-11 | METAL CHIP                    | 4.7K 5% 1/16W               |
| Q603     | 8-729-420-50 | TRANSISTOR UN5215      |                              | R604     | 1-216-823-11 | METAL CHIP                    | 1.5K 5% 1/16W               |
| Q604     | 8-729-420-50 | TRANSISTOR UN5215      |                              | R701     | 1-216-823-11 | METAL CHIP                    | 1.5K 5% 1/16W               |
| Q701     | 8-729-230-72 | TRANSISTOR 2SA1362YG   |                              | R702     | 1-216-855-11 | METAL CHIP                    | 680K 5% 1/16W               |
| Q702     | 8-729-420-50 | TRANSISTOR UN5215      |                              | R703     | 1-216-853-11 | METAL CHIP                    | 470K 5% 1/16W               |
|          |              | < RESISTOR >           |                              | R704     | 1-218-911-11 | RES,CHIP                      | 470K 0.50% 1/16W            |
| R101     | 1-216-849-11 | METAL CHIP             | 220K 5% 1/16W                | R705     | 1-218-911-11 | RES,CHIP                      | 470K 0.50% 1/16W            |
| R102     | 1-216-839-11 | METAL CHIP             | 33K 5% 1/16W                 | R706     | 1-218-911-11 | RES,CHIP                      | 470K 0.50% 1/16W            |
| R103     | 1-216-811-11 | METAL CHIP             | 150 5% 1/16W                 | R707     | 1-218-915-11 | RES,CHIP                      | 680K 0.50% 1/16W            |
| R104     | 1-216-831-11 | METAL CHIP             | 6.8K 5% 1/16W                | R708     | 1-218-903-11 | RES,CHIP                      | 220K 0.50% 1/16W            |
| R105     | 1-216-823-11 | METAL CHIP             | 1.5K 5% 1/16W                | R709     | 1-218-895-11 | RES,CHIP                      | 100K 0.50% 1/16W            |
| R106     | 1-216-825-11 | METAL CHIP             | 2.2K 5% 1/16W                | R710     | 1-216-853-11 | METAL CHIP                    | 470K 5% 1/16W               |
| R107     | 1-216-837-11 | METAL CHIP             | 22K 5% 1/16W                 | R711     | 1-216-853-11 | METAL CHIP                    | 470K 5% 1/16W               |
| R108     | 1-216-789-11 | METAL CHIP             | 2.2 5% 1/16W                 | R712     | 1-216-853-11 | METAL CHIP                    | 470K 5% 1/16W               |
| R109     | 1-216-821-11 | METAL CHIP             | 1K 5% 1/16W                  | R713     | 1-216-841-11 | METAL CHIP                    | 47K 5% 1/16W                |
| R110     | 1-216-837-11 | METAL CHIP             | 22K 5% 1/16W                 | R714     | 1-216-803-11 | METAL CHIP                    | 33 5% 1/16W                 |
| R111     | 1-216-827-11 | METAL CHIP             | 3.3K 5% 1/16W                | R715     | 1-216-827-11 | METAL CHIP                    | 3.3K 5% 1/16W               |
| R112     | 1-216-809-11 | METAL CHIP             | 100 5% 1/16W                 | R717     | 1-216-821-11 | METAL CHIP                    | 1K 5% 1/16W                 |
| R112     | 1-216-825-11 | METAL CHIP             | 2.2K 5% 1/16W<br>(AEP,UK,EE) | R718     | 1-216-821-11 | METAL CHIP                    | 1K 5% 1/16W                 |
| R113     | 1-216-853-11 | METAL CHIP             | 470K 5% 1/16W<br>(FR)        | R719     | 1-216-809-11 | METAL CHIP                    | 100 5% 1/16W                |
| R150     | 1-216-813-11 | METAL CHIP             | 220 5% 1/16W<br>(FR)         | R720     | 1-218-871-11 | RES,CHIP                      | 10K 0.50% 1/16W             |
| R201     | 1-216-849-11 | METAL CHIP             | 220K 5% 1/16W                | R721     | 1-218-839-11 | RES,CHIP                      | 470 0.50% 1/16W             |
| R202     | 1-216-839-11 | METAL CHIP             | 33K 5% 1/16W                 | R722     | 1-218-855-11 | RES,CHIP                      | 2.2K 0.50% 1/16W            |
| R203     | 1-216-811-11 | METAL CHIP             | 150 5% 1/16W                 | R723     | 1-218-851-11 | RES,CHIP                      | 1.5K 0.50% 1/16W            |
| R204     | 1-216-831-11 | METAL CHIP             | 6.8K 5% 1/16W                | R724     | 1-218-875-11 | RES,CHIP                      | 15K 0.50% 1/16W             |
| R205     | 1-216-823-11 | METAL CHIP             | 1.5K 5% 1/16W                | R726     | 1-216-821-11 | METAL CHIP                    | 1K 5% 1/16W                 |
| R206     | 1-216-825-11 | METAL CHIP             | 2.2K 5% 1/16W                | R731     | 1-216-833-11 | METAL CHIP                    | 10K 5% 1/16W                |
| R207     | 1-216-837-11 | METAL CHIP             | 22K 5% 1/16W                 | R732     | 1-216-847-11 | METAL CHIP                    | 150K 5% 1/16W               |
| R208     | 1-216-789-11 | METAL CHIP             | 2.2 5% 1/16W                 | R733     | 1-218-895-11 | RES,CHIP                      | 100K 0.50% 1/16W            |
| R209     | 1-216-821-11 | METAL CHIP             | 1K 5% 1/16W                  | R734     | 1-218-851-11 | RES,CHIP                      | 1.5K 0.50% 1/16W            |
| R210     | 1-216-837-11 | METAL CHIP             | 22K 5% 1/16W                 | R735     | 1-218-871-11 | RES,CHIP                      | 10K 0.50% 1/16W             |
|          |              |                        |                              | R736     | 1-218-867-11 | RES,CHIP                      | 6.8K 0.50% 1/16W            |
|          |              |                        |                              | R738     | 1-218-895-11 | RES,CHIP                      | 100K 0.50% 1/16W            |
|          |              |                        |                              | R739     | 1-218-911-11 | RES,CHIP                      | 470K 0.50% 1/16W            |
|          |              |                        |                              |          |              | < CONPOSITION CIRCUIT BLOCK > |                             |
|          |              |                        |                              | RB601    | 1-234-243-21 | RES, NETWORK 220K (3216)      |                             |
|          |              |                        |                              | RB602    | 1-234-200-21 | RES, NETWORK 100 (3216)       |                             |

**MAIN**

| Ref. No. | Part No.     | Description                        | Remarks |
|----------|--------------|------------------------------------|---------|
|          |              | < VARIABLE RESISTOR >              |         |
| RV301    | 1-225-684-21 | RES, VAR, CARBON 30K/30K (VOL)     |         |
| RV601    | 1-225-254-21 | RES, ADJ, CARBON 2.2K (TAPE SPEED) |         |
|          |              | < SWITCH >                         |         |
| S701     | 1-771-475-21 | SWITCH, SLIDE (DIRECTION)          |         |
| S702     | 1-771-053-21 | SWITCH, KEY BOARD (■)              |         |
| S703     | 1-771-053-21 | SWITCH, KEY BOARD (◀▶ REPEAT)      |         |
| S704     | 1-771-053-21 | SWITCH, KEY BOARD (FF)             |         |
| S705     | 1-771-053-21 | SWITCH, KEY BOARD (REW)            |         |
| S707     | 1-572-922-11 | SWITCH, SLIDE (HOLD)               |         |
|          |              | < THERMISTOR >                     |         |
| THP601   | 1-810-794-11 | THERMISTOR, POSITIVE 3.3K          |         |
|          |              | < VIBRATOR >                       |         |
| X701     | 1-579-258-11 | VIBRATOR, CRYSTAL (32.768kHz)      |         |
| *****    |              |                                    |         |
|          |              | MISCELLANEOUS                      |         |
| *****    |              |                                    |         |
| S901     | 1-762-553-11 | SWITCH, LEAF                       |         |
| HP901    | 1-500-576-11 | HEAD, MAGNETIC (PLAYBACK)          |         |
| M901     | 1-763-166-11 | MOTOR (CAPSTAN/REEL) (WITH PULLEY) |         |
| PM901    | 1-454-674-32 | SOLENOID, PLUNGER                  |         |
| *****    |              |                                    |         |

| Ref. No. | Part No.     | Description                              | Remarks  |
|----------|--------------|--|----------|
|          |              | ACCESSORIES                              |          |
|          |              | *****                                    |          |
|          | 1-418-021-11 | REMOTE CONTROL UNIT (RM-WME21)           |          |
| △        | 1-528-252-21 | BATTERY CHARGER (BC-7S)(UK)              |          |
|          | 1-528-543-22 | BATTERY, NI-CD (NC-6WM)                  |          |
| △        | 1-528-744-23 | BATTERY CHARGER (BC-7DY)(AEP,FR,EE)      |          |
|          | 1-759-700-21 | CASE, BATTERY                            |          |
|          | 3-008-521-01 | CASE, BATTERY CHARGE                     |          |
|          | 3-029-488-01 | POUCH, CARRYING                          |          |
|          | 3-864-887-11 | MANUAL, INSTRUCTION (ENGLISH/FRENCH)     |          |
|          | 3-864-887-21 | MANUAL, INSTRUCTION (GERMAN/DUTCH)       | (AEP)    |
|          | 3-864-887-31 | MANUAL, INSTRUCTION (SWEDISH/ITALIAN)    | (AEP)    |
|          | 3-864-887-41 | MANUAL, INSTRUCTION (SPANISH/PORTUGUESE) | (AEP)    |
|          | 3-864-887-51 | MANUAL, INSTRUCTION (FINNISH/RUSSIAN)    | (AEP,EE) |
|          | 3-864-887-61 | MANUAL, INSTRUCTION (POLISH/CZECH)       | (EE)     |
|          | 8-953-272-90 | HEADPHONE MDR-ED136SP//K SET             |          |

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