

# WM-A53/B53

## SERVICE MANUAL



*US Model*  
*Canadian Model*

*WM-A53*

*AEP Model*

*E Model*

*WM-B53*

|                                    |          |
|------------------------------------|----------|
| Model Name Using Similar Mechanism | NEW      |
| Tape Transport Mechanism Type      | MT-WMA53 |

### SPECIFICATIONS

Power requirement 3 V DC, two R6 (size AA) batteries  
Battery life (hours)

| Batteries                     | Playback  |
|-------------------------------|-----------|
| Sony battery SUM-3 (NS)       | approx. 3 |
| Sony alkaline battery AM3 (N) | approx. 7 |

Accessories supplied Belt clip (1)  
For Canada, Europe and U.K.  
Stereo headphones (open-air type, 1)  
For the other countries  
Stereo earphones (open-air type, 1)

Design and specifications subject to change without notice.

#### Note

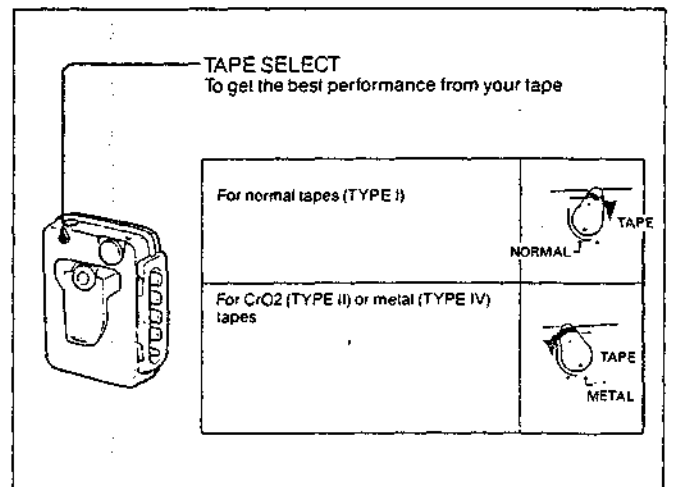
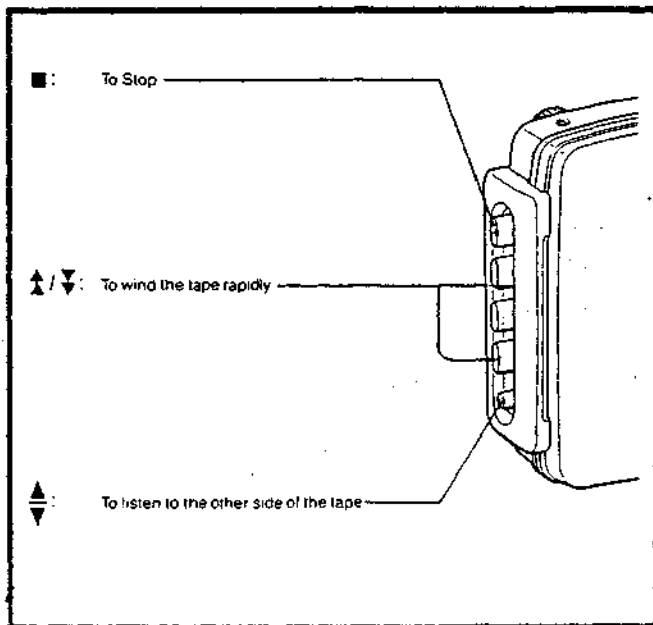
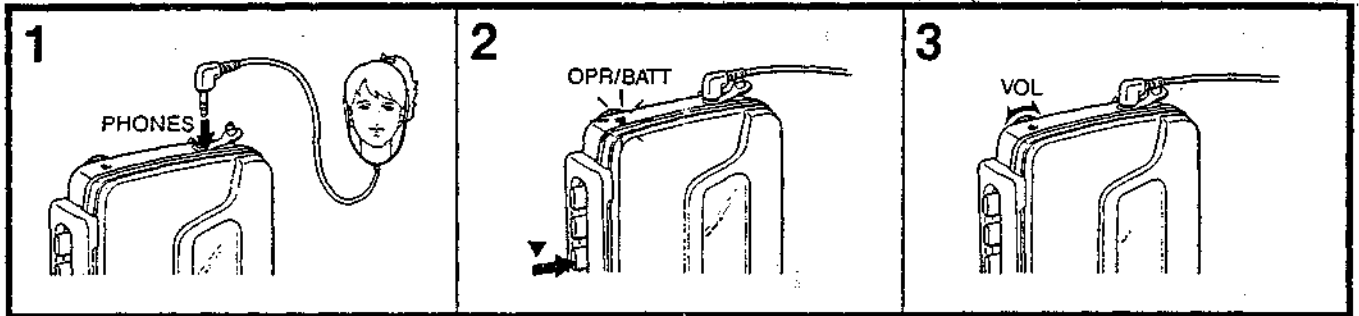
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

CASSETTE PLAYER  
**SONY**



## SECTION 1 GENERAL

### LOCATION AND FUNCTION OF CONTROLS

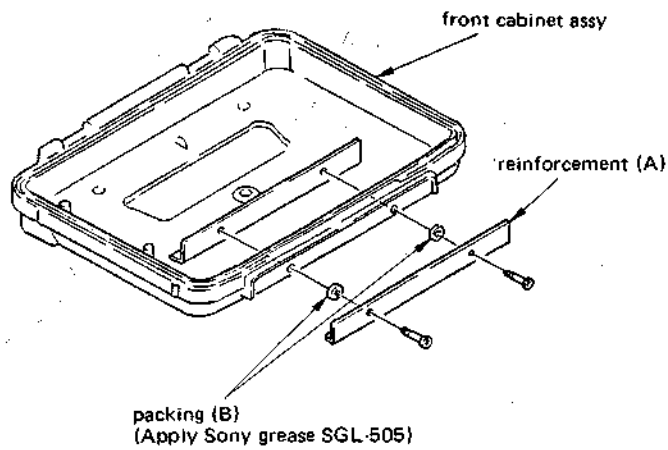
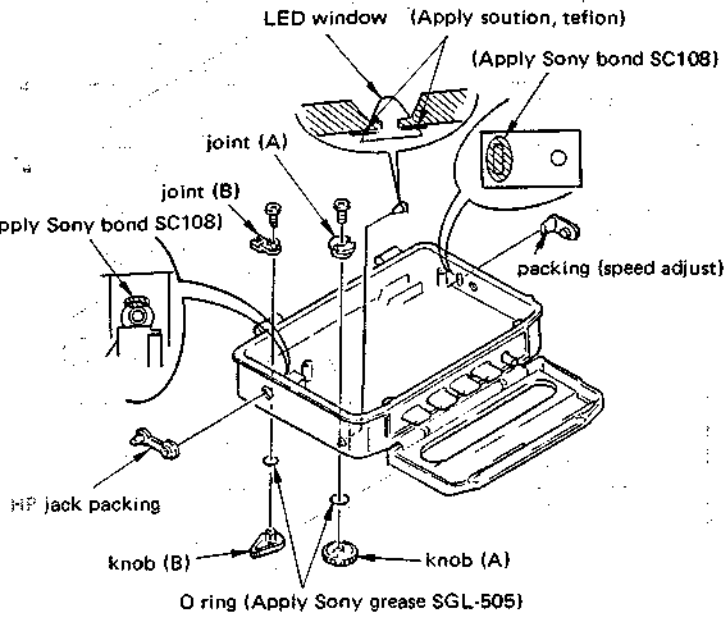


**SECTION 2**  
**NOTE ON REPAIR**

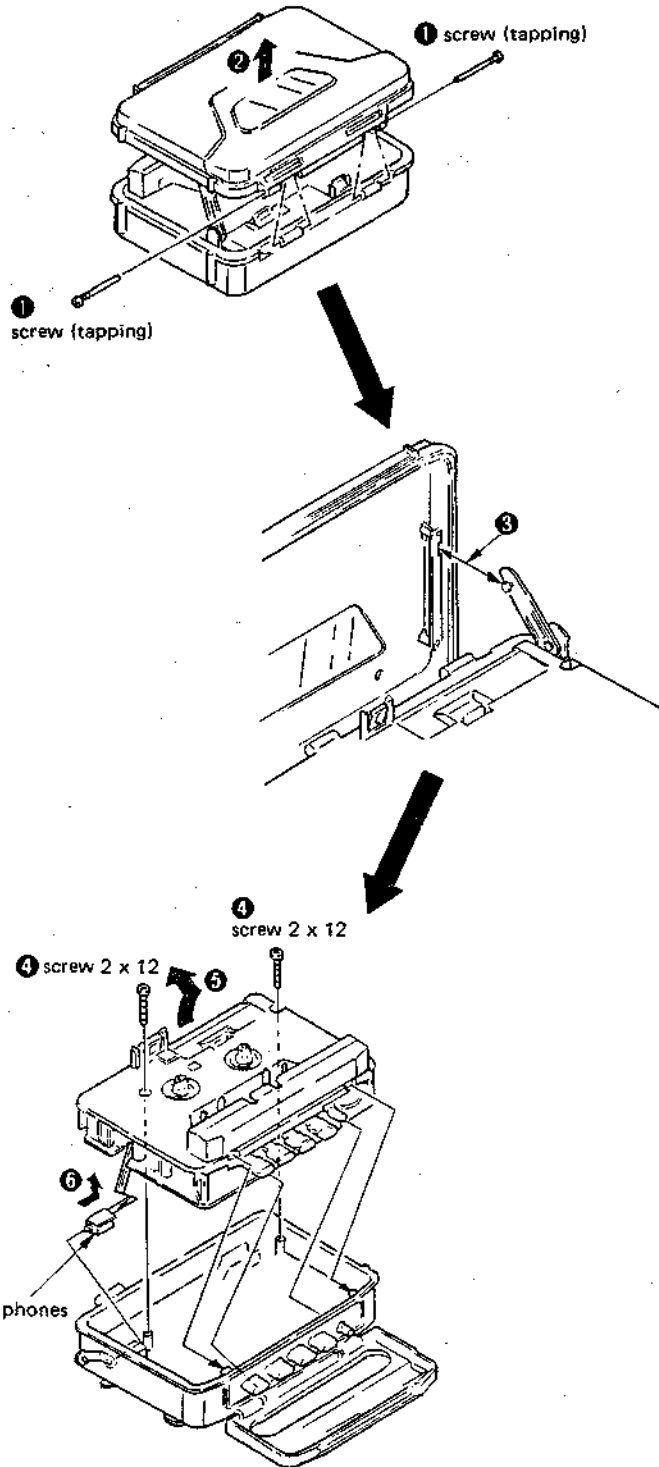
**SECTION 3**  
**DISASSEMBLY**

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

**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



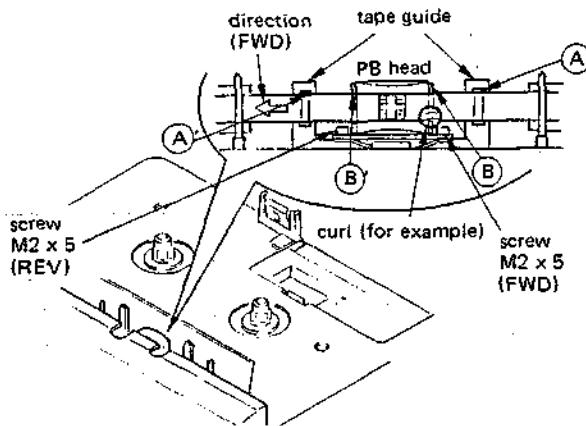
## SECTION 4 ADJUSTMENTS

### PRECAUTION

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

|               |              |
|---------------|--------------|
| playback head | rubber belts |
| capstan       | idlers       |
| pinch roller  |              |
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 (3.0V) unless otherwise noted.

### Playback Head Height Adjustment (Note on Playback Head Replacement)



1. Turn the screw M2 x 5 so that the (B) - (B) line of HEAD GUIDE becomes approximately parallel to the (A) - (A) line of TAPE GUIDE.
2. When there is a tape curl on HEAD GUIDE (B), (B) using a mirror cassette, turn the screw M2 x 5 to eliminate the tape curl.  
For example in the figure:  
(The curl marked ○ is eliminated by turning clockwise the screw M2 x 5 (right).)
3. Check in the REV mode by the same way as in the FWD mode.

### 4-1. MECHANICAL ADJUSTMENT

#### Torque Measurement

| Mode             | Torque Meter | Meter Reading                             |
|------------------|--------------|---|
| FWD              | CQ-102C      | 25 to 55 g·cm<br>(0.35 to 0.76 oz·inch)   |
| FWD Back Tension |              | 1.5 to 4.5 g·cm<br>(0.02 to 0.06 oz·inch) |
| REV              | CQ-102RC     | 25 to 55 g·cm<br>(0.35 to 0.76 oz·inch)   |
| REV Back Tension |              | 1.5 to 4.5 g·cm<br>(0.02 to 0.06 oz·inch) |
| FF               | CQ-201B      | 55 to 150 g·cm<br>(0.76 to 2.1 oz·inch)   |
| REW              |              | 55 to 150 g·cm<br>(0.76 to 2.1 oz·inch)   |

#### Tape Pulling Force Measurement

| Mode | Tension Meter | Meter Reading                        |
|------|---------------|--------------------------------------|
| FWD  | CQ-403A       | more than 45 g<br>(more than 1.6 oz) |
| REV  | CQ-403R       | more than 45 g<br>(more than 1.6 oz) |

#### TEST TAPE

| Type     | Signal          | Used for                         |
|----------|-----------------|----------------------------------|
| WS-48A   | 3 kHz, 0 dB     | Tape Speed Adjustment            |
| P-4-A063 | 6.3 kHz, -10 dB | Dolby NR Head Azimuth Adjustment |

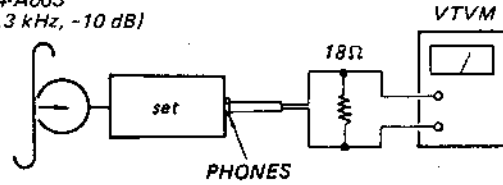
## 4-2. ELECTRICAL ADJUSTMENTS

### Playback Head Azimuth Adjustment

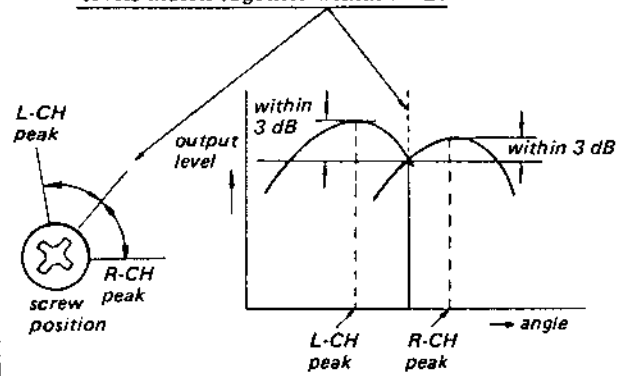
#### Procedure:

1. Playback mode

test tape  
P-4-A063  
(6.3 kHz, -10 dB)



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 3 dB.



Adjustment should be made in both directions of FWD and REV.

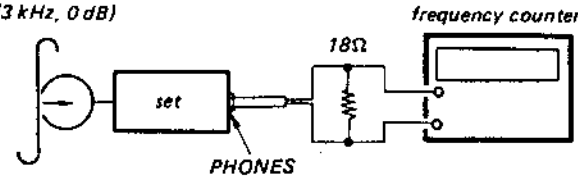
Adjustment screws should be stopped turning in the clockwise direction.

After the adjustment, lock the screws with locking compound.

### Tape Speed Adjustment

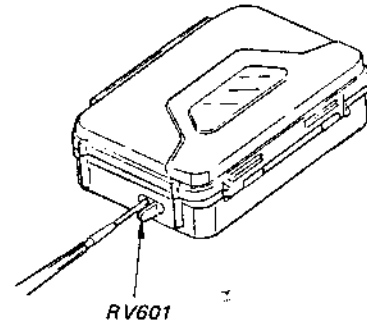
#### Procedure:

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



1. Play back WS-48A (Tape center portion) in FWD mode. Adjust the RV601 so that the frequency counter reads  $3,000 \pm 90$  Hz.
2. Play back WS-48A (Tape center portion) in REV mode. Confirm that the reading of frequency counter is within 1.5% from the reading in step 1.

#### Adjustment Location:



# SECTION 5 DIAGRAMS

## 5-1. PRINTED WIRING BOARDS

Note:

● ■ : parts mounted on the conductor side.

### ● Semiconductor Location

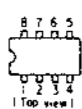
| Ref. No. | Location |
|----------|----------|
| D301     | D-5      |
| IC301    | C-4      |
| IC601    | B-3      |

### ● Semiconductor Lead Layouts

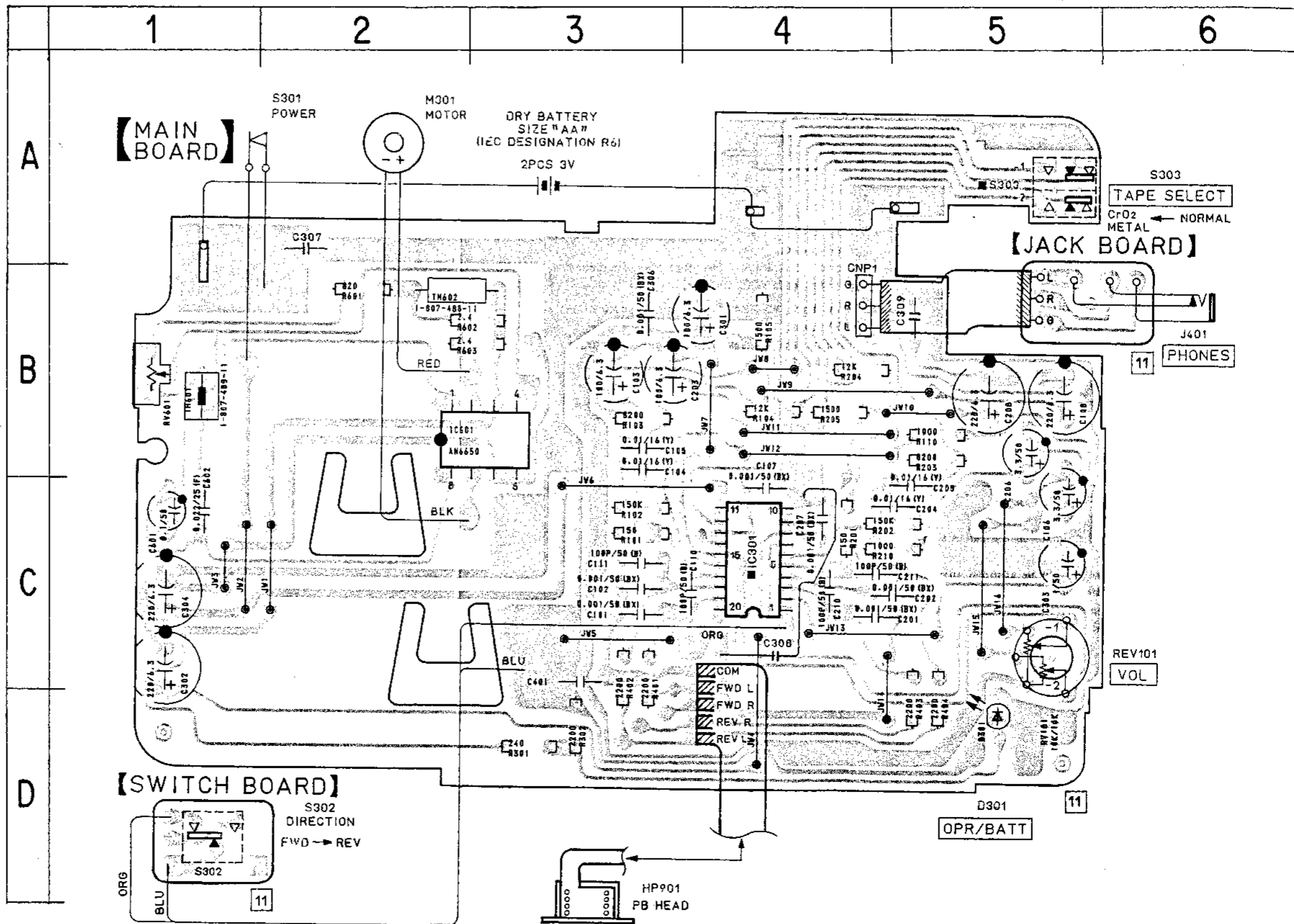
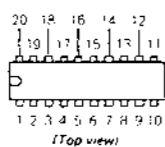
AN6650



LA4580M



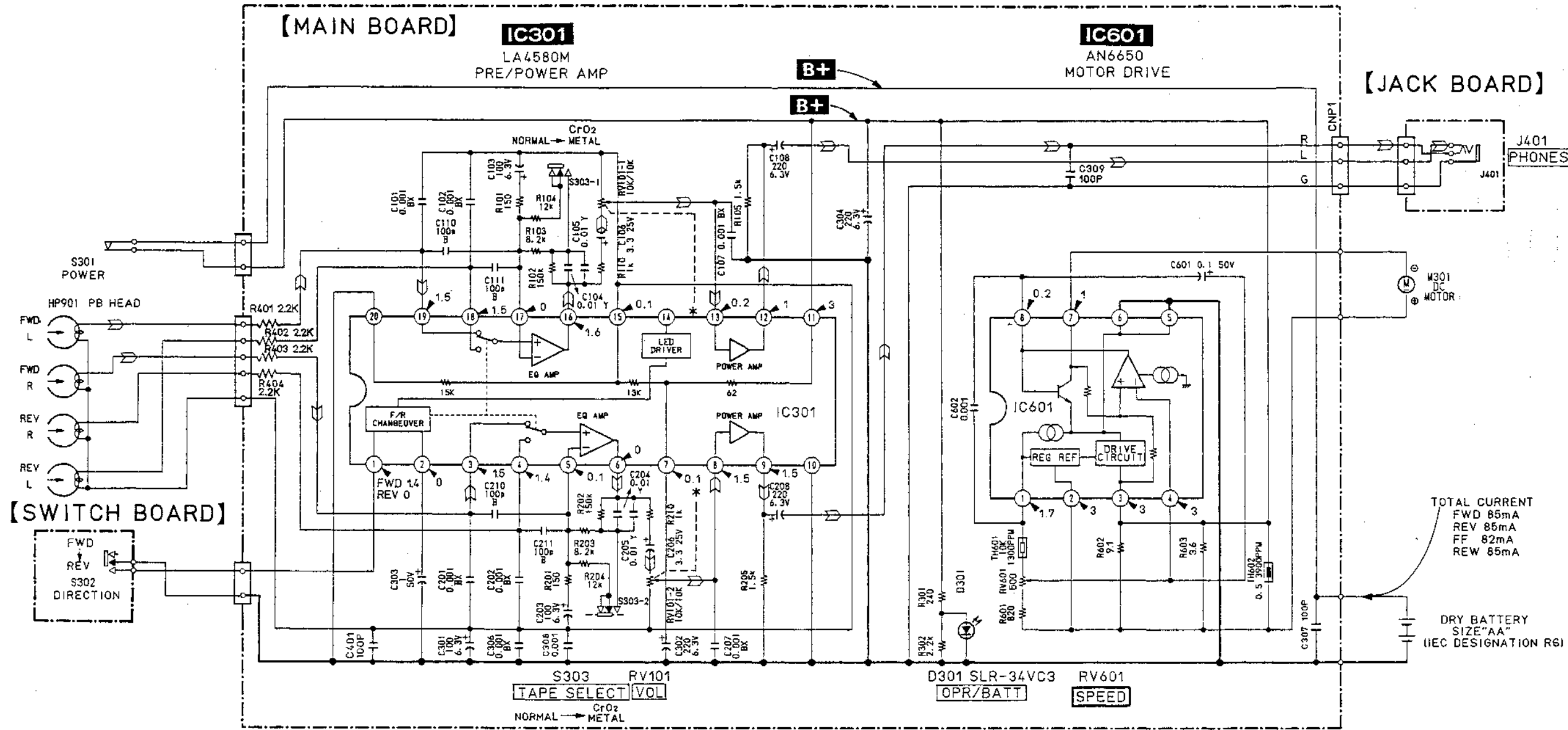
SLR-34VR70



5.2. SCHEMATIC DIAGRAM

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

A  
B  
C  
D  
E  
F  
G  
H  
I  
J



TOTAL CURRENT  
FWD 85mA  
REV 85mA  
FF 82mA  
REW 85mA

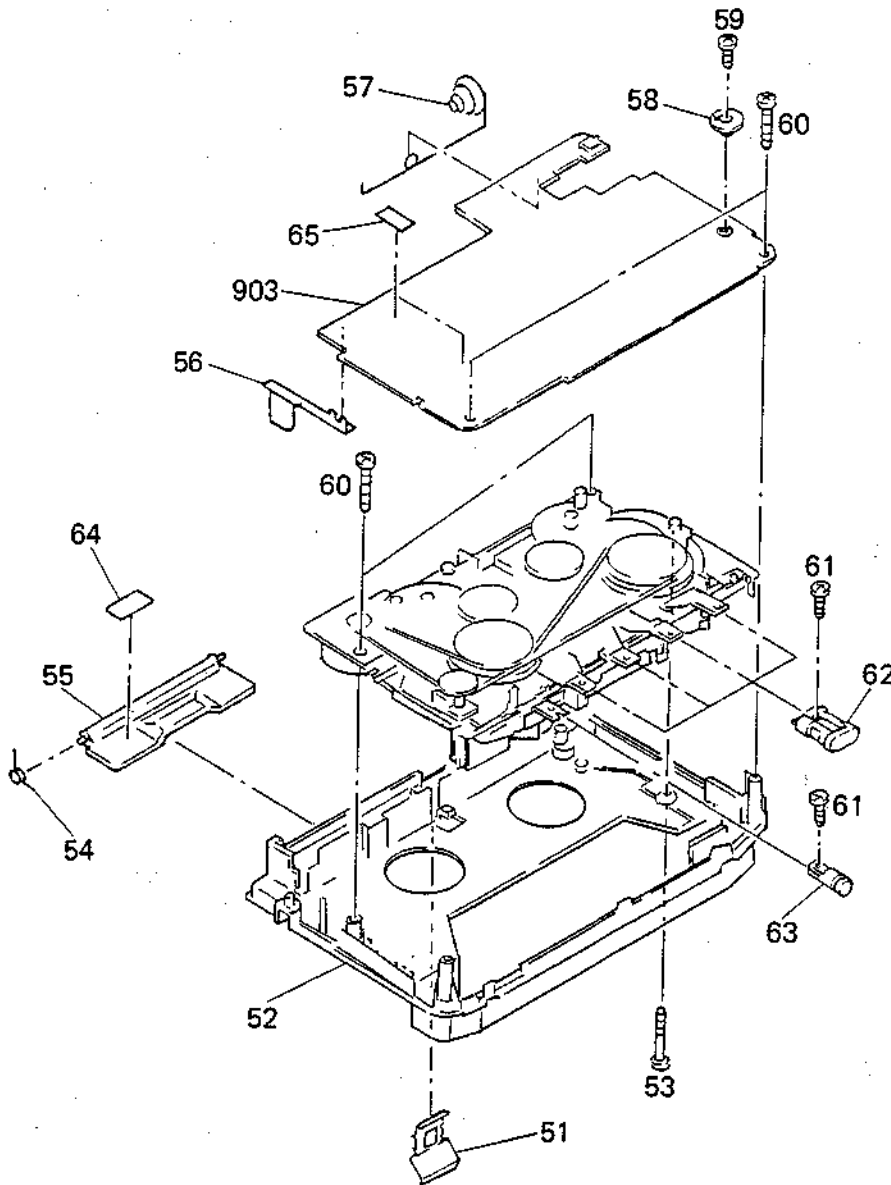
DRY BATTERY  
SIZE "AA"  
(IEC DESIGNATION R6)

- Note:**
- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\text{pF}$  50WV or less are not indicated except for electrolytics and tantalums.
  - All resistors are in  $\Omega$  and  $\frac{1}{4}\text{W}$  or less unless otherwise specified.
  - **B+** : B+ Line
  - : adjustment for repair.
  - Total current is measured with no cassette installed.
  - Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
  - Voltage and waveforms are dc with respect to ground in playback mode.
  - Voltages are taken with a VOM (input impedance 10M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
  - Signal path.
  - $\Sigma$  : PB





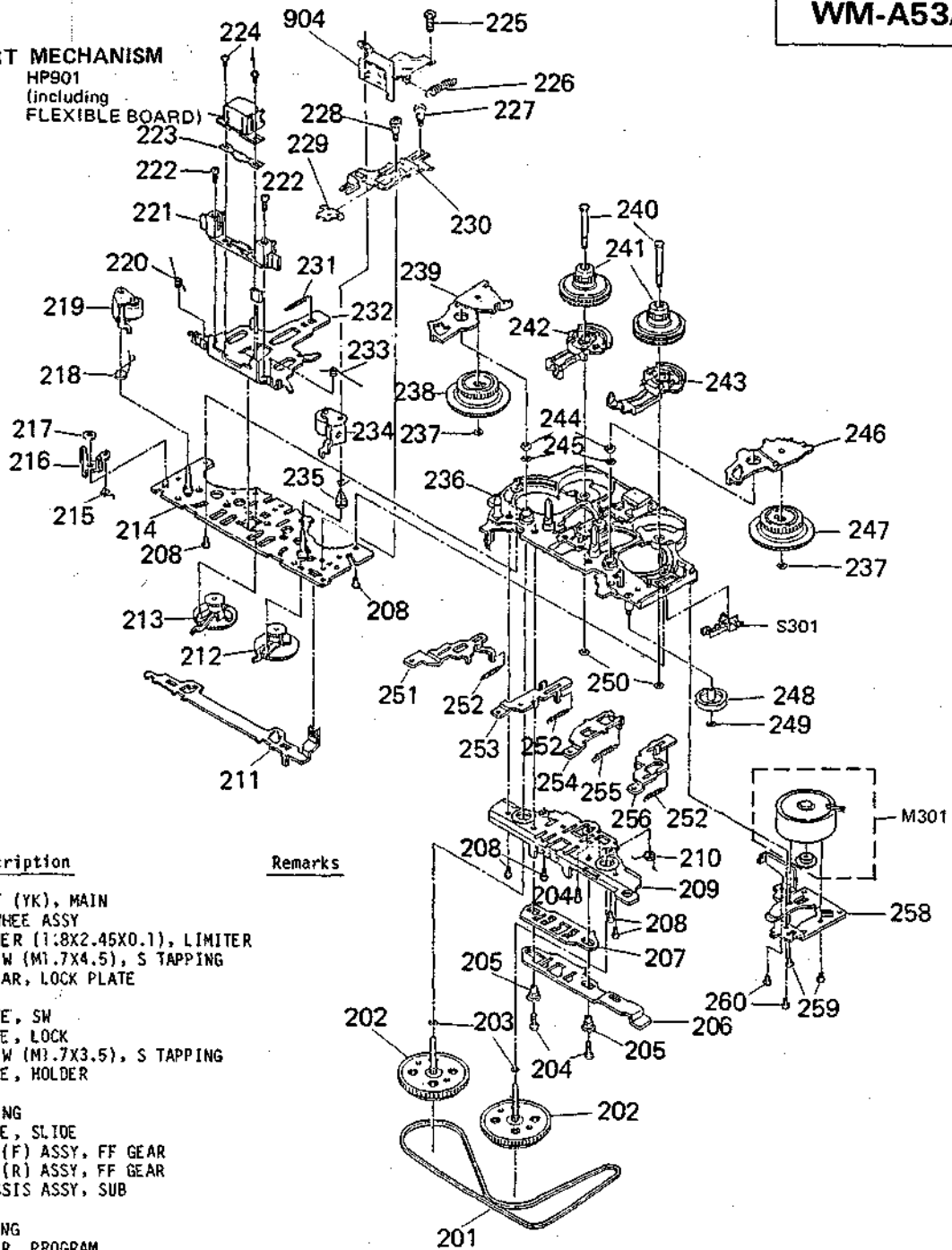
(2) CHASSIS



| No. | Part No.      | Description                     | Remarks | No. | Part No.      | Description                 | Remarks |
|-----|---------------|---------------------------------|---------|-----|---------------|-----------------------------|---------|
| 51  | 3-351-153-01  | SPRING                          |         | 59  | 3-318-201-51  | SCREW (B) (1.4X4), TAPPING  |         |
| 52  | *3-351-162-01 | CHASSIS                         |         | 60  | 7-685-103-19  | SCREW +P 2X5 TYPE2 NON-SLIT |         |
| 53  | 7-627-852-67  | SCREW, PRECISION +P 1.7X6 TYPE3 |         | 61  | 7-627-552-07  | SCREW (M1.7X2.5), TAPPING   |         |
| 54  | 3-326-134-01  | SPRING, TORSION                 |         | 62  | 3-351-141-01  | BUTTON (A)                  |         |
| 55  | 3-351-142-01  | LID, BATTERY CASE               |         | 63  | 3-351-143-01  | BUTTON (B)                  |         |
| 56  | 3-351-151-01  | TERMINAL BOARD, BATTERY         |         | 64  | 9-911-850-XX  | FELT                        |         |
| 57  | 3-351-152-01  | SPRING                          |         | 65  | 3-831-441-XX  | SPACER, KNOB                |         |
| 58  | 3-351-140-01  | JOINT (D)                       |         | 903 | *A-3015-765-A | PC BOARD ASSY, MAIN         |         |

(3) TAPE TRANSPORT MECHANISM  
(MT-WMA53)

HP901  
(including  
FLEXIBLE BOARD)



| No. | Part No.      | Description                    | Remarks |
|-----|---------------|--------------------------------|---------|
| 201 | 3-395-041-01  | BELT (YK), MAIN                |         |
| 202 | 3-395-040-01  | FLYWHEEL ASSY                  |         |
| 203 | 3-395-057-01  | WASHER (1.8X2.45X0.1), LIMITER |         |
| 204 | 3-395-047-01  | SCREW (M1.7X4.5), S TAPPING    |         |
| 205 | 3-395-015-01  | COLLAR, LOCK PLATE             |         |
| 206 | *3-395-014-01 | PLATE, SW                      |         |
| 207 | *3-395-013-01 | PLATE, LOCK                    |         |
| 208 | 3-395-046-01  | SCREW (M1.7X3.5), S TAPPING    |         |
| 209 | *3-395-010-01 | PLATE, HOLDER                  |         |
| 210 | 3-395-011-01  | SPRING                         |         |
| 211 | *3-395-003-01 | PLATE, SLIDE                   |         |
| 212 | 3-395-004-01  | ARM (F) ASSY, FF GEAR          |         |
| 213 | 3-395-005-01  | ARM (R) ASSY, FF GEAR          |         |
| 214 | *3-395-002-01 | CHASSIS ASSY, SUB              |         |
| 215 | 3-395-035-01  | SPRING                         |         |
| 216 | 3-395-034-01  | LEVER, PROGRAM                 |         |
| 217 | 3-395-053-01  | WASHER (CUT) (1.85X5X0.5), P   |         |
| 218 | 3-395-019-01  | SPRING (R)                     |         |
| 219 | 3-395-030-01  | PINCH ROLLER (R) ASSY          |         |
| 220 | 3-395-022-01  | SPRING (R)                     |         |
| 221 | 3-395-023-01  | GUIDE, TAPE                    |         |
| 222 | 3-395-048-01  | SCREW (M2X5)                   |         |
| 223 | 3-395-025-01  | PLATE, SPRING, HEAD            |         |
| 224 | 3-395-049-01  | SCREW (M2X4), + - (SPECIAL)    |         |
| 225 | 3-351-132-01  | SCREW                          |         |
| 226 | 3-351-150-01  | SPRING, TENSION                |         |
| 227 | 3-351-131-01  | SCREW, STEP                    |         |
| 228 | 3-351-131-11  | SCREW, STEP                    |         |
| 229 | *3-351-127-01 | LEVER (A)                      |         |
| 230 | *X-3336-729-1 | LEVER (B) ASSY                 |         |
| 231 | 3-395-027-01  | SPRING                         |         |
| 232 | *3-395-020-01 | PANEL (V), HEAD                |         |
| 233 | 3-395-021-01  | SPRING (F)                     |         |
| 234 | 3-395-029-01  | PINCH ROLLER (F) ASSY          |         |
| 235 | 3-395-018-01  | SPRING (F)                     |         |
| 236 | *3-395-001-01 | CHASSIS ASSY                   |         |
| 237 | 3-395-054-01  | WASHER (CUT) (0.8X2.4X0.25),HL |         |
| 238 | 3-395-032-01  | GEAR (R), T CAM                |         |
| 239 | 3-395-017-01  | ARM (R) ASSY, T GEAR           |         |
| 240 | 3-395-039-01  | SHAFT, REEL                    |         |
| 241 | 3-395-038-01  | REEL ASSY                      |         |

| No.   | Part No.      | Description                    | Remarks |
|-------|---------------|--------------------------------|---------|
| 242   | 3-395-037-01  | LEVER (R) ASSY, AUTO           |         |
| 243   | 3-395-036-01  | LEVER (F) ASSY, AUTO           |         |
| 244   | 3-395-059-01  | WASHER (1.45X3.2X0.5), HL      |         |
| 245   | 3-395-058-01  | WASHER (1.85X3.2X0.2), P       |         |
| 246   | 3-395-016-01  | ARM (F) ASSY, T GEAR           |         |
| 247   | 3-395-031-01  | GEAR (F), T CAM                |         |
| 248   | 3-395-033-01  | PULLEY, SUB                    |         |
| 249   | 3-395-055-01  | WASHER (CUT) (0.85X2.8X0.25),P |         |
| 250   | 3-395-056-01  | WASHER (CUT)(1.13X3.6X0.25),HL |         |
| 251   | *3-395-008-01 | LEVER (V), STOP                |         |
| 252   | 3-395-045-01  | SPRING                         |         |
| 253   | *3-395-007-01 | LEVER (R) (V), FF              |         |
| 254   | *3-395-009-01 | LEVER (V), PLAY                |         |
| 255   | 3-395-028-01  | SPRING                         |         |
| 256   | *3-395-006-01 | LEVER (F) (V), FF              |         |
| 258   | *3-395-042-01 | BRACKET, MOTOR                 |         |
| 259   | 3-395-051-01  | SCREW (M1.7X1.6), CAMERA       |         |
| 260   | 3-395-052-01  | SCREW (M1.7X3), PS TAPPING     |         |
| 904   | *1-630-793-11 | PC BOARD, SWITCH               |         |
| HP901 | 1-543-633-11  | HEAD, MAGNETIC (PLAYBACK)      |         |
| M301  | X-3336-744-1  | MOTOR, ASSY                    |         |
| S301  | 1-571-951-11  | SWITCH, LEAF (POWER)           |         |

## 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:  $\mu$ F, PF:  $\mu$ MF.

**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

**COILS**

- MMH: mH, UH:  $\mu$ H

**SEMICONDUCTORS**

In each case, U:  $\mu$ , for example:

UA...:  $\mu$ A..., UPA...:  $\mu$ PA...,  
UPC...:  $\mu$ PC, UPD...:  $\mu$ PD...

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

Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

| Ref.No. | Part No.      | Description                          |         |     |      |
|---------|---------------|--------------------------------------|---------|-----|------|
| 901     | *1-630-794-11 | PC BOARD, JACK                       |         |     |      |
| 902     | 1-574-787-11  | CABLE, FLAT (2.5MM PITCH)            |         |     |      |
| 903     | *A-3015-765-A | PC BOARD ASSY, MAIN                  |         |     |      |
| 904     | *1-630-793-11 | PC BOARD, SWITCH                     |         |     |      |
| C101    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C102    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C103    | 1-126-177-11  | ELECT                                | 100MF   | 20% | 6.3V |
| C104    | 1-161-379-00  | CERAMIC                              | 0.01MF  | 30% | 16V  |
| C105    | 1-161-379-00  | CERAMIC                              | 0.01MF  | 30% | 16V  |
| C106    | 1-123-382-00  | ELECT                                | 3.3MF   | 20% | 50V  |
| C107    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C108    | 1-126-335-11  | ELECT                                | 220MF   | 20% | 6.3V |
| C110    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C111    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C201    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C202    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C203    | 1-126-177-11  | ELECT                                | 100MF   | 20% | 6.3V |
| C204    | 1-161-379-00  | CERAMIC                              | 0.01MF  | 30% | 16V  |
| C205    | 1-161-379-00  | CERAMIC                              | 0.01MF  | 30% | 16V  |
| C206    | 1-123-382-00  | ELECT                                | 3.3MF   | 20% | 50V  |
| C207    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C208    | 1-126-335-11  | ELECT                                | 220MF   | 20% | 6.3V |
| C210    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C211    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C301    | 1-126-177-11  | ELECT                                | 100MF   | 20% | 6.3V |
| C302    | 1-126-335-11  | ELECT                                | 220MF   | 20% | 6.3V |
| C303    | 1-124-499-11  | ELECT                                | 1MF     | 20% | 50V  |
| C304    | 1-126-335-11  | ELECT                                | 220MF   | 20% | 6.3V |
| C306    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C307    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C308    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| C309    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C401    | 1-162-282-31  | CERAMIC                              | 100PF   | 10% | 50V  |
| C601    | 1-124-463-00  | ELECT                                | 0.1MF   | 20% | 50V  |
| C602    | 1-162-294-31  | CERAMIC                              | 0.001MF | 10% | 50V  |
| CNP1    | 1-568-596-11  | CONNECTOR, FC 5P                     |         |     |      |
| D301    | 1-807-738-11  | DIODE SLR-34VR70F130 (LED)           |         |     |      |
| HP901   | 1-543-633-11  | HEAD, MAGNETIC (PLAYBACK)            |         |     |      |
| IC301   | 8-759-820-66  | IC LA4580M                           |         |     |      |
| IC601   | 8-759-403-83  | IC AN6650                            |         |     |      |
| J401    | 1-563-298-11  | JACK (SMALL TYPE) (DIA. 3.5)(PHONES) |         |     |      |
| M301    | X-3336-744-1  | MOTOR, ASSY                          |         |     |      |

| Ref.No. | Part No.     | Description                    |      |    |      |
|---------|--------------|--------------------------------|------|----|------|
| R101    | 1-249-407-11 | CARBON                         | 150  | 5% | 1/4W |
| R102    | 1-247-883-00 | CARBON                         | 150K | 5% | 1/4W |
| R103    | 1-249-428-11 | CARBON                         | 8.2K | 5% | 1/4W |
| R104    | 1-249-430-11 | CARBON                         | 12K  | 5% | 1/4W |
| R105    | 1-249-419-11 | CARBON                         | 1.5K | 5% | 1/4W |
| R110    | 1-249-417-11 | CARBON                         | 1K   | 5% | 1/4W |
| R201    | 1-249-407-11 | CARBON                         | 150  | 5% | 1/4W |
| R202    | 1-247-883-00 | CARBON                         | 150K | 5% | 1/4W |
| R203    | 1-249-428-11 | CARBON                         | 8.2K | 5% | 1/4W |
| R204    | 1-249-430-11 | CARBON                         | 12K  | 5% | 1/4W |
| R205    | 1-249-419-11 | CARBON                         | 1.5K | 5% | 1/4W |
| R210    | 1-249-417-11 | CARBON                         | 1K   | 5% | 1/4W |
| R301    | 1-247-816-11 | CARBON                         | 240  | 5% | 1/4W |
| R302    | 1-249-421-11 | CARBON                         | 2.2K | 5% | 1/4W |
| R401    | 1-249-421-11 | CARBON                         | 2.2K | 5% | 1/4W |
| R402    | 1-249-421-11 | CARBON                         | 2.2K | 5% | 1/4W |
| R403    | 1-249-421-11 | CARBON                         | 2.2K | 5% | 1/4W |
| R404    | 1-249-421-11 | CARBON                         | 2.2K | 5% | 1/4W |
| R601    | 1-249-416-11 | CARBON                         | 820  | 5% | 1/4W |
| R602    | 1-247-782-91 | CARBON                         | 9.1  | 5% | 1/4W |
| R603    | 1-247-772-91 | CARBON                         | 3.6  | 5% | 1/4W |
| RV101   | 1-230-593-11 | RES, VAR, CARBON 10K/10K (VOL) |      |    |      |
| RV601   | 1-238-594-11 | RES, ADJ, CARBON 500 (SPEED)   |      |    |      |
| S301    | 1-571-951-11 | SWITCH, LEAF (POWER)           |      |    |      |
| S302    | 1-570-355-11 | SWITCH, SLIDE (DIRECTION)      |      |    |      |
| S303    | 1-571-674-11 | SWITCH, SLIDE (TAPE SELECT)    |      |    |      |
| TH601   | 1-807-488-11 | THERMISTOR (POSITIVE)          |      |    |      |
| TH602   | 1-808-680-11 | THERMISTOR (POSITIVE)          |      |    |      |

**ACCESSORY & PACKING MATERIAL**

|               |   |
|---------------|---|
| *3-351-178-01 | (A53:US).....CUSHION (UPPER)              |
| *3-351-179-01 | (A53:US).....CUSHION (LOWER)              |
| *3-351-182-01 | (A53:Canadian,B53)....CUSHION (UPPER)     |
| *3-351-183-01 | (A53:Canadian,B53)....CUSHION (LOWER)     |
| *3-351-184-01 | (A53:Canadian)....INDIVIDUAL CARTON       |
| *3-351-186-01 | (B53:AEP).....INDIVIDUAL CARTON           |
| *3-351-190-01 | (B53:E).....INDIVIDUAL CARTON             |
| 3-750-305-11  | (A53:Canadian,B53)....MANUAL, INSTRUCTION |
| 3-750-305-21  | (A53:US).....MANUAL, INSTRUCTION          |
| 3-750-305-41  | (A53:AEP).....MANUAL, INSTRUCTION         |
| 8-952-261-90  | (A53,B53:AEP)....HEADPHONE MDR-W15L/Y SET |
| 8-952-265-90  | (B53:E).....HEADPHONE MDR-E215/Y SET      |
| X-3336-728-1  | CASE ASSY, CARRYING                       |