

# MZ-R90/R91

## SERVICE MANUAL

Ver 1.4 2001.01  
With SUPPLEMENT-1  
(9-927-187-83)



Photo: MZ-R91 (Blue type)

US Model  
Canadian Model  
Australian Model  
Chinese Model  
MZ-R90

AEP Model  
UK Model  
E Model  
Tourist Model  
MZ-R90/R91

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	NEW
Mechanism Type	MT-MZR90-165
Optical Pick-up Name	LCX-2R

### SPECIFICATIONS

#### System

##### Audio playing system

MiniDisc digital audio system

##### Laser diode properties

Material: GaAlAs

Wavelength:  $\lambda = 790 \text{ nm}$

Emission duration: continuous

Laser output: less than  $44.6 \mu\text{W}$

(This output is the value measured at a distance of 200 mm from the lens surface on the optical pick-up block with 7 mm aperture.)

##### Recording and playback time

Maximum 80 minutes (MDW-80, stereo recording)

Maximum 160 minutes (MDW-80, monaural recording)

Maximum 74 minutes (MDW-74, stereo recording)

Maximum 148 minutes (MDW-74, monaural recording)

##### Revolutions

400 rpm to 1,800 rpm (CLV)

##### Error correction

Advanced Cross Interleave Reed Solomon Code (ACIRC)

##### Sampling frequency

44.1 kHz

##### Sampling rate converter

Input: 32 kHz/44.1 kHz/48 kHz

##### Coding

Adaptive TRansform Acoustic Coding (ATRAC)

##### Modulation system

EFM (Eight to Fourteen Modulation)

##### Number of channels

2 stereo channels

1 monaural channel

##### Frequency response

20 to 20,000 Hz  $\pm 3 \text{ dB}$

##### Wow and Flutter

Below measurable limit

##### Inputs

Microphone: stereo mini-jack, 0.35–1.38 mV

Line in: stereo mini-jack, 69–194 mV

Optical (Digital) in: optical (digital) mini-jack

##### Outputs

$\phi$ /LINE OUT\*: stereo mini-jack

Headphones: maximum output level 5 mV + 5 mV, load impedance 16 ohm

LINE OUT: 194 mV, load impedance 10 kilohm

\* The  $\phi$ /LINE OUT jack connects either headphones or a line cable.

#### General

##### Power requirements

Sony AC Power Adaptor (supplied) connected at the DC IN 3 V jack:

220–230 V AC, 50/60 Hz (European model)

120 V AC, 50 Hz (Canadian model)

100–240 V AC, 50/60 Hz (Other models)

Nickel metal hydride rechargeable battery NH-14WM (supplied)

LR6 (size AA) alkaline battery (not supplied)

##### Battery operation time

##### Battery life<sup>1)</sup>

Batteries	Recording <sup>2)</sup>	Playback
NH-14WM nickel metal hydride rechargeable battery	Approx. 6.5 hours	Approx. 12 hours
LR6 (SG) (size AA) Sony alkaline dry battery	Approx. 4 hours	Approx. 16.5 hours
NH-14WM nickel metal hydride rechargeable battery + One LR6 (SG) (size AA)	Approx. 14.5 hours	Approx. 29 hours

<sup>1)</sup> The battery life may be shorter due to operating conditions and the temperature of the location.

<sup>2)</sup> When you record, use a fully charged rechargeable battery.

#### Dimensions

MZ-R90

Approx. 78.9 × 17.3 × 72.0 mm (w/h/d)  
(3<sup>1</sup>/<sub>8</sub> × 1<sup>1</sup>/<sub>16</sub> × 2<sup>7</sup>/<sub>8</sub> in.)

MZ-R91

Approx. 78.9 × 18.0 × 72.0 mm (w/h/d)  
(3<sup>1</sup>/<sub>8</sub> × 2<sup>3</sup>/<sub>32</sub> × 2<sup>7</sup>/<sub>8</sub> in.)

#### Mass

MZ-R90

Approx. 105 g (3.7 oz) the recorder only  
Approx. 148 g (5.2 oz) incl. a recordable MD, and NH-14WM nickel metal hydride rechargeable battery

MZ-R91

Approx. 110 g (3.8 oz) the recorder only  
Approx. 153 g (5.4 oz) incl. a recordable MD, and NH-14WM nickel metal hydride rechargeable battery

#### Supplied accessories

AC power adaptor (1)

Headphones with a remote control (1) (RM-MZ2S)

NH-14WM nickel metal hydride rechargeable battery (1)

Dry battery case (1)

Rechargeable battery carrying case (1)

Carrying pouch (1)

AC plug adaptor (1)

Design and specifications are subject to change without notice.

## PORTABLE MINIDISC RECORDER

# SONY®

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### Flexible Circuit Board Repairing

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

### Notes on chip component replacement

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

#### CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

#### 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.

#### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  $\triangle$  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

# SECTION 1

## SERVICING NOTES

### NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

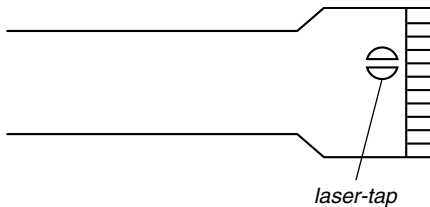
The flexible board is easily damaged and should be handled with care.

### NOTES ON LASER DIODE EMISSION CHECK

Never look into the laser diode emission from right above when checking it for adjustment. It is feared that you will lose your sight.

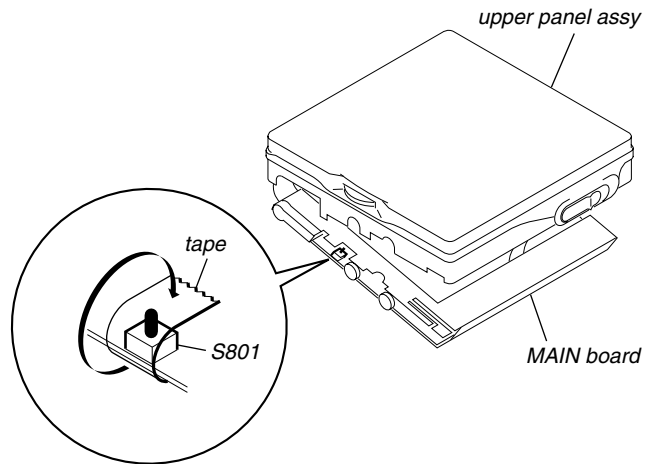
### NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (LCX-2R)

The laser diode in the optical pick-up block may suffer electrostatic break-down easily. When handling it, perform soldering bridge to the laser-tap on the flexible board. Also perform measures against electrostatic break-down sufficiently before the operation. The flexible board is easily damaged and should be handled with care.



**OPTICAL PICK-UP FLEXIBLE BOARD**

- When repairing this device with the power on, if you remove the MAIN board or open the upper panel assy, this device stops working. In this case, you can work without the device stopping by fastening the hook of the open/close detect switch (S801) with tape.



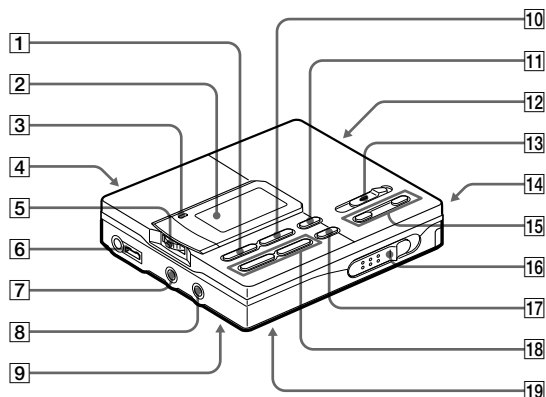
- This set is designed to perform automatic adjustment for each adjustment and write its value to EEPROM. Therefore, when EEPROM (IC802) has been replaced in service, be sure to perform automatic adjustment and write resultant values to the new EEPROM. (Refer to Section 5 Electrical Adjustment. (page 18))
- Replacement of CXD2660GA (IC502) and CXR701080-013GA (IC801) used in this set requires a special tool. Therefore, they cannot be replaced.

## SECTION 2 GENERAL

This section is extracted from instruction manual.

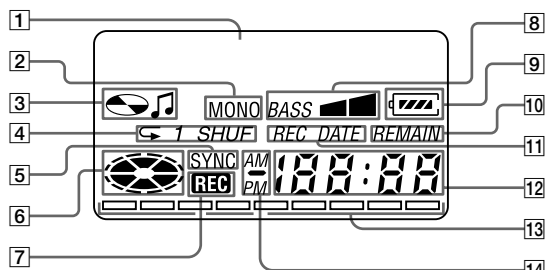
### • LOCATION OF CONTROLS

#### – The recorder –



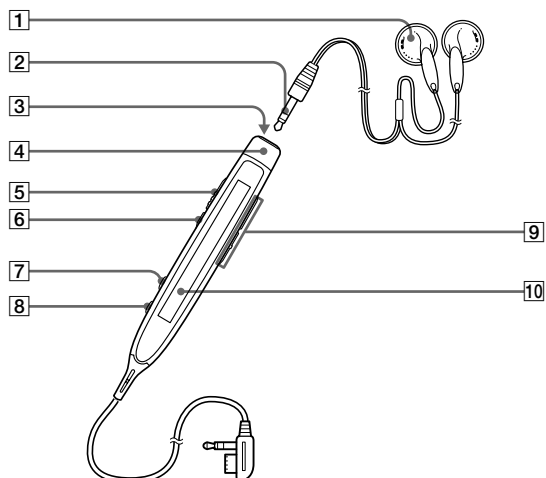
- 1 ■ (stop) /CHARGE button
- 2 Display window
- 3 REC indicator
- 4 DC IN 3V jack
- 5 Jog lever
- 6 ◯/LINE OUT (headphones/line out) jack
- 7 MIC (PLUG IN POWER) jack
- 8 LINE IN (OPTICAL) jack
- 9 HOLD switch
- Slide to lock the controls of the recorder.
- 10 ► (play) button
- 11 || (pause) button
- 12 T MARK (track mark) button
- 13 REC (record) switch
- 14 Battery compartment
- 15 VOL (volume) +/- buttons
- 16 OPEN switch
- 17 END SEARCH button
- 18 ◀▶ (search/AMS) buttons
- 19 SYNCHRO REC (synchro-recording) ON/OFF switch

#### – The display window of the recorder –



- 1 Character information display  
Displays the disc and track name\*, date, error messages, track numbers, etc.  
\* Disc and track names appear only with MDs that have been electronically labeled.
- 2 MONO (monaural) indication
- 3 Disc name/track name indications  
Appears when labeling disc or track respectively.
- 4 Play mode indication  
Shows the play mode of the MD.  
↺ (all repeat): All tracks play repeatedly.  
↺ (single repeat): One track plays repeatedly.  
↺ (SHUF): (shuffle repeat): Tracks will be repeated in random order.
- 5 SYNC (synchro-recording) indication  
Lights up while synchro-recording.
- 6 Disc indication  
Shows that the disc is rotating for recording, playing or editing an MD.
- 7 REC indication  
Lights up while recording. Flashes when standing by for recording.
- 8 Mega bass indication
- 9 Battery indication  
Shows approximate battery condition. While charging the rechargeable battery, this indication shows the charging condition.
- 10 REMAIN (remaining time/tracks) indication  
Lights up along with the remaining time of the track, remaining time of the MD, or remaining number of tracks.
- 11 REC DATE (recorded/current date) indication  
Lights up along with the date and time the MD was recorded. When only "DATE" lights up, the current date and time are displayed.
- 12 Time display  
Shows the elapsed time of the track being recorded or played.
- 13 Level meter  
Shows the level of the MD being played or recorded.
- 14 AM/PM indication  
Lights up along with the time indication in the 12-hour system.

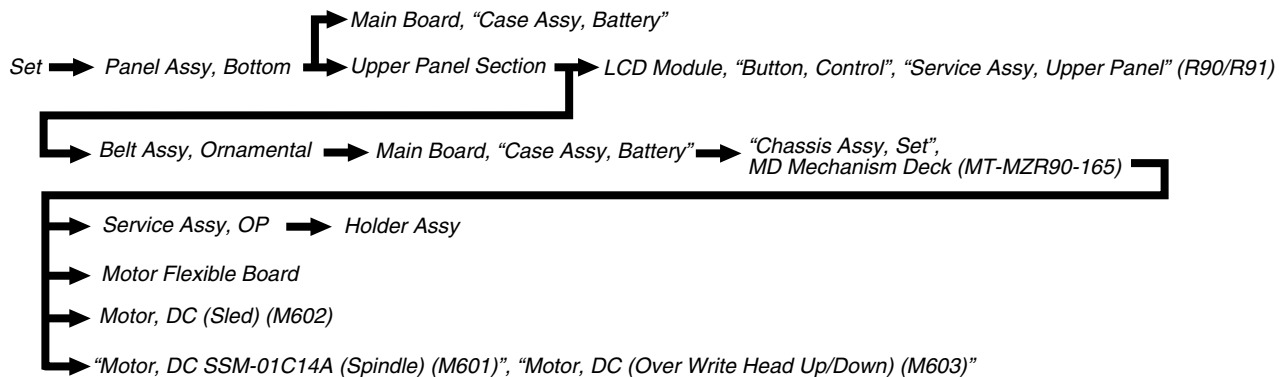
#### – The headphones with a remote control (RM-MZ2S) –



- 1 Headphones  
Can be replaced with optional headphones.
- 2 Stereo mini plug
- 3 ■ (stop) button
- 4 Control  
To play, press the control towards ▶▶▶ during stop. Press the control towards ▶▶▶ during play to search the beginning of the succeeding track; hold in this position to fast-forward. Press towards ◀◀◀ during play to search the beginning of the preceding track; hold in this position to rewind.
- 5 HOLD switch  
Slide to lock the controls of the remote control.
- 6 || (pause) button
- 7 PLAY MODE button
- 8 DISPLAY button
- 9 VOL (volume) +/- buttons  
When the AVLS is set to on, you cannot increase the volume to the maximum. To increase the volume above the limited level, set the AVLS to off using the jog lever.
- 10 Display window

## SECTION 3 DISASSEMBLY

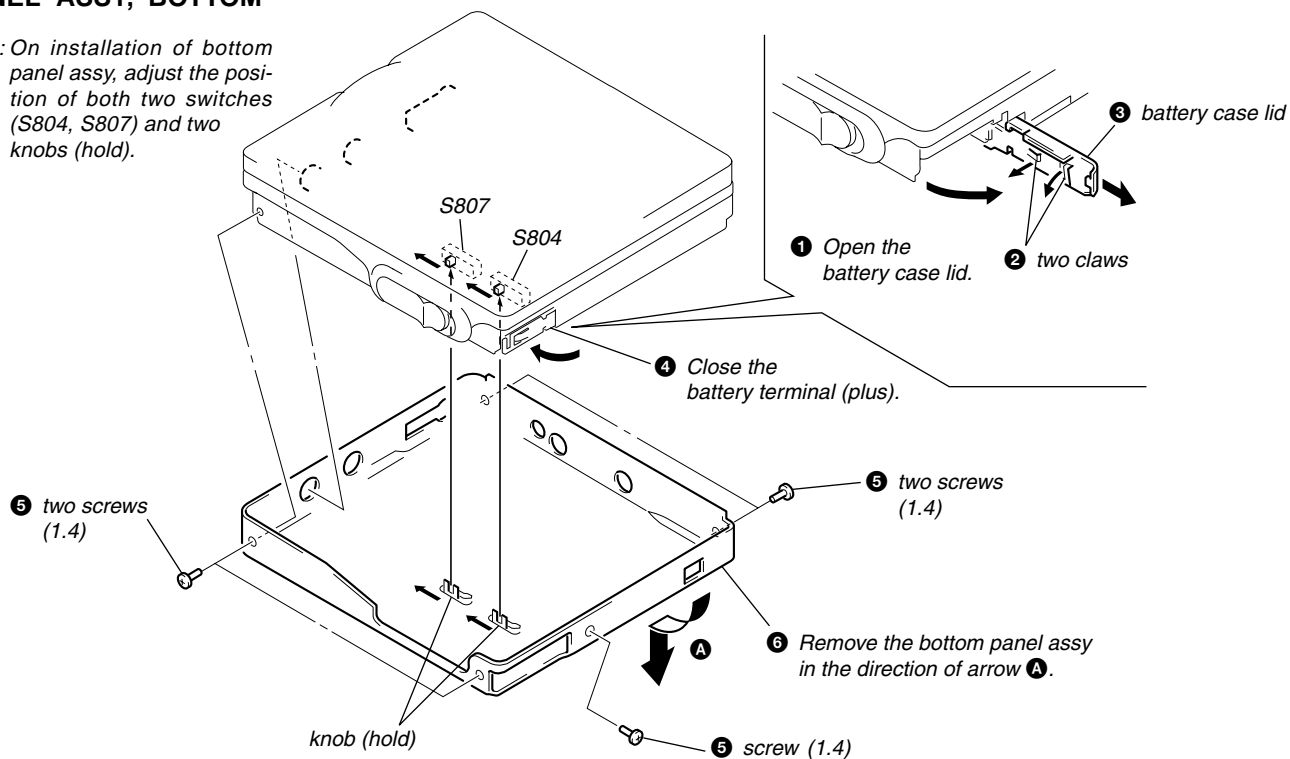
- This set can be disassembled in the order shown below.



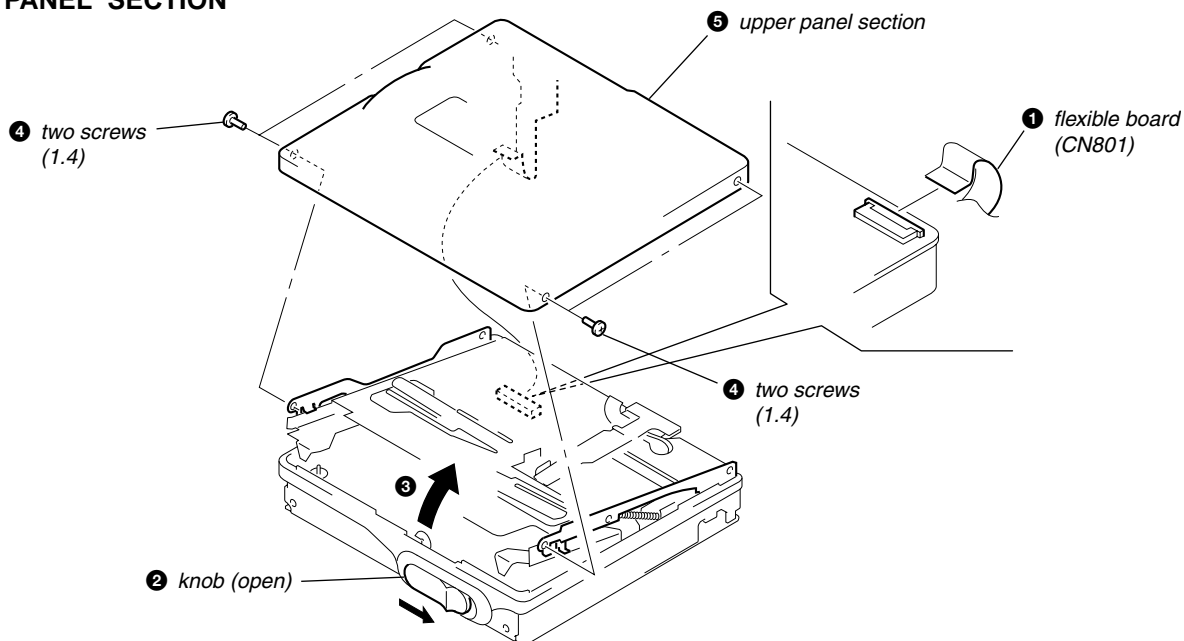
**Note:** Follow the disassembly procedure in the numerical order given.

### PANEL ASSY, BOTTOM

*Note: On installation of bottom panel assy, adjust the position of both two switches (S804, S807) and two knobs (hold).*

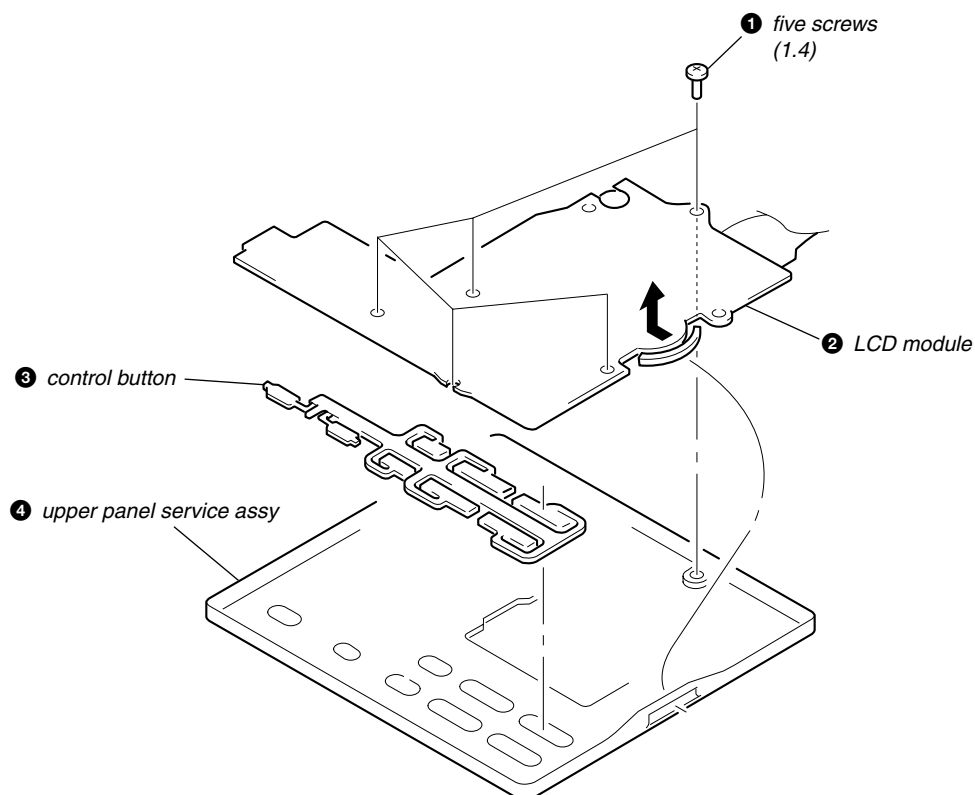


### UPPER PANEL SECTION

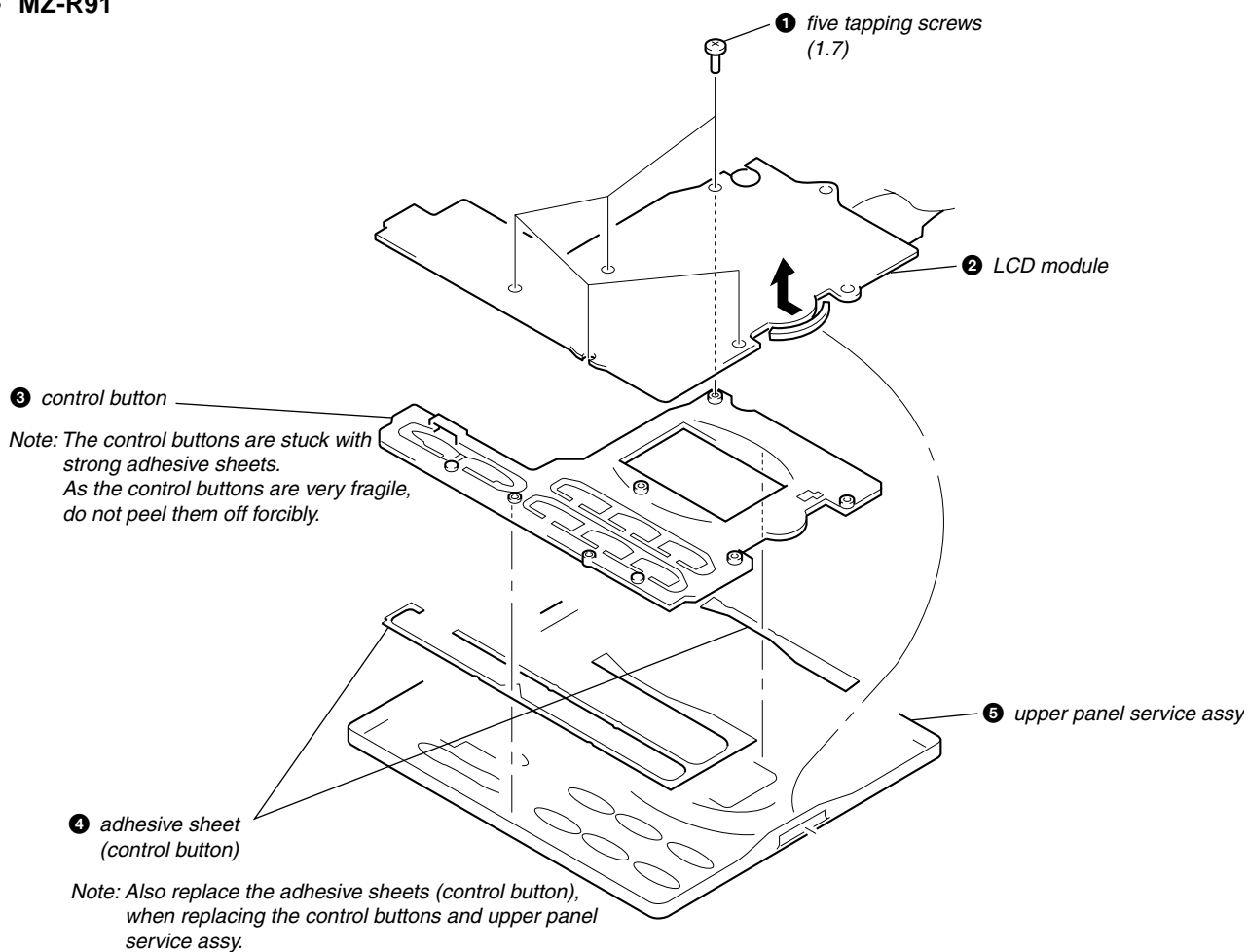


## LCD MODULE, "BUTTON, CONTROL", "SERVICE ASSY, UPPER PANEL"

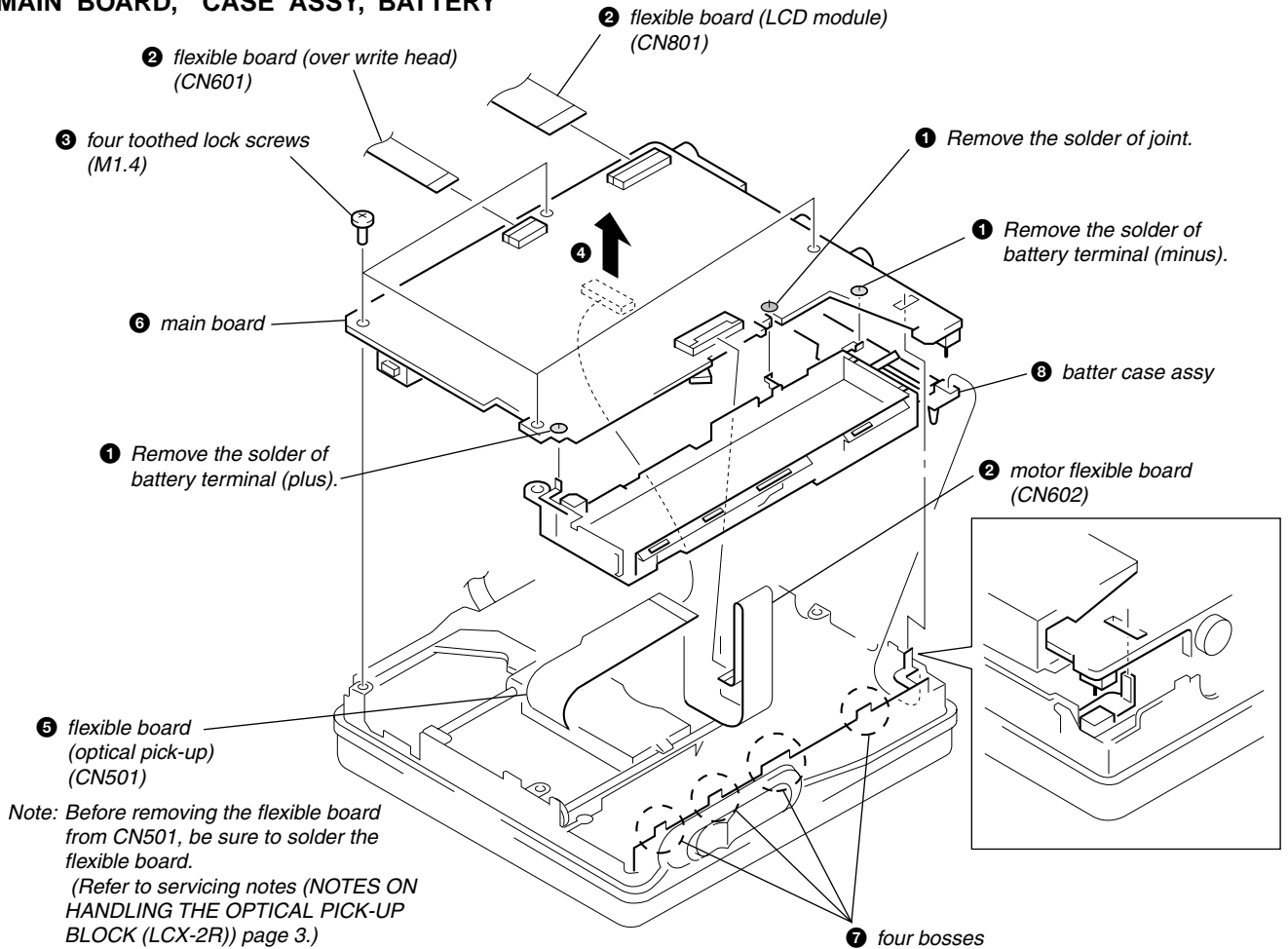
### • MZ-R90



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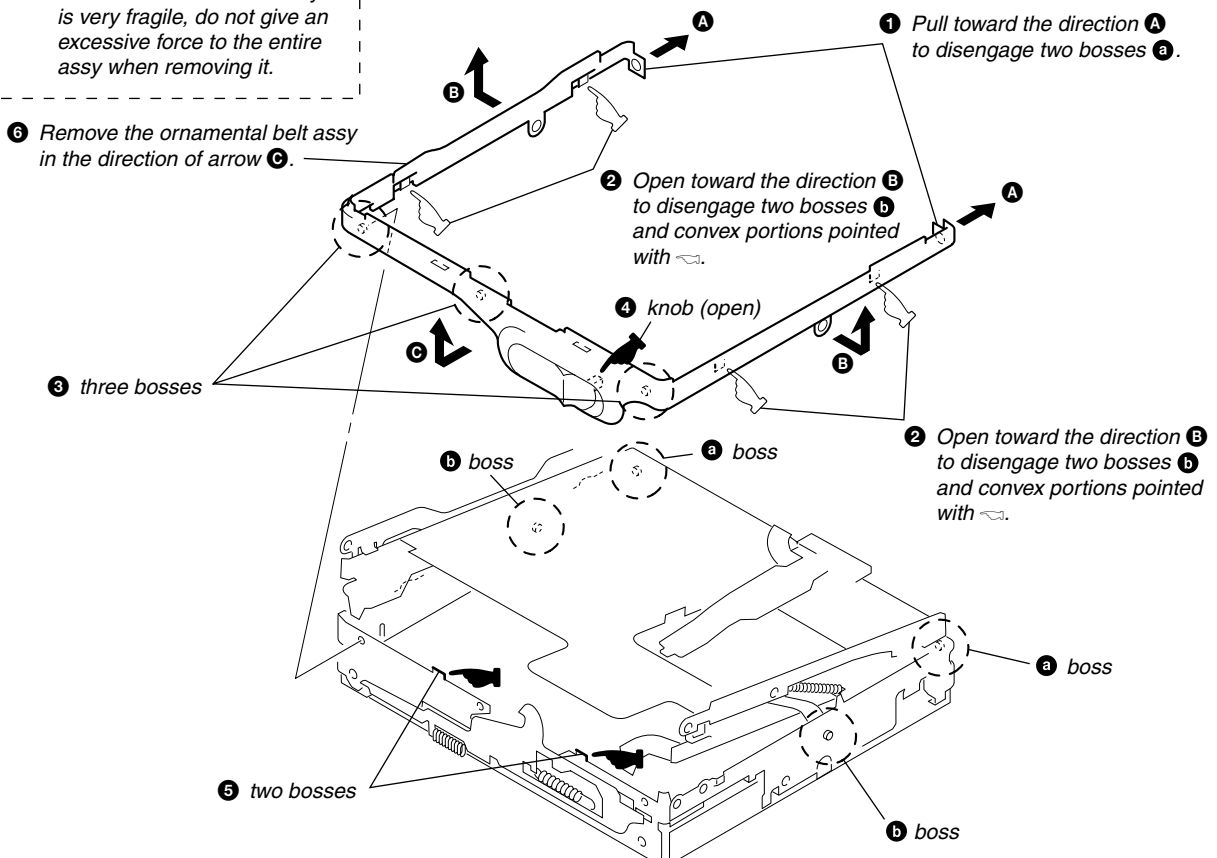


## MAIN BOARD, "CASE ASSY, BATTERY"

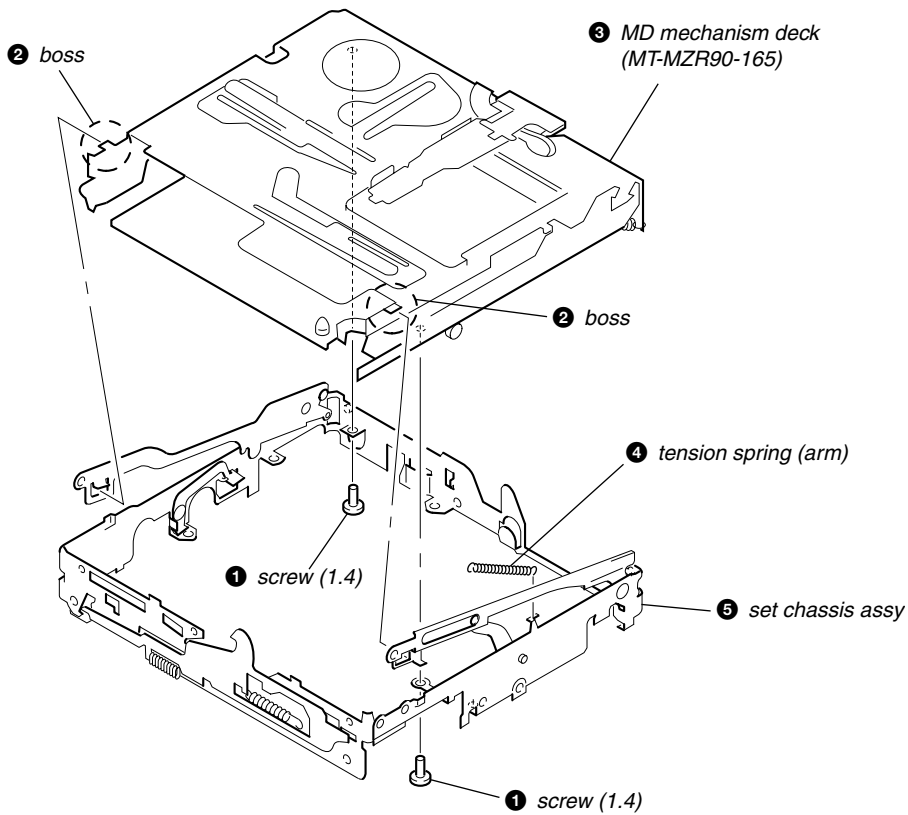


## BELT ASSY, ORNAMENTAL

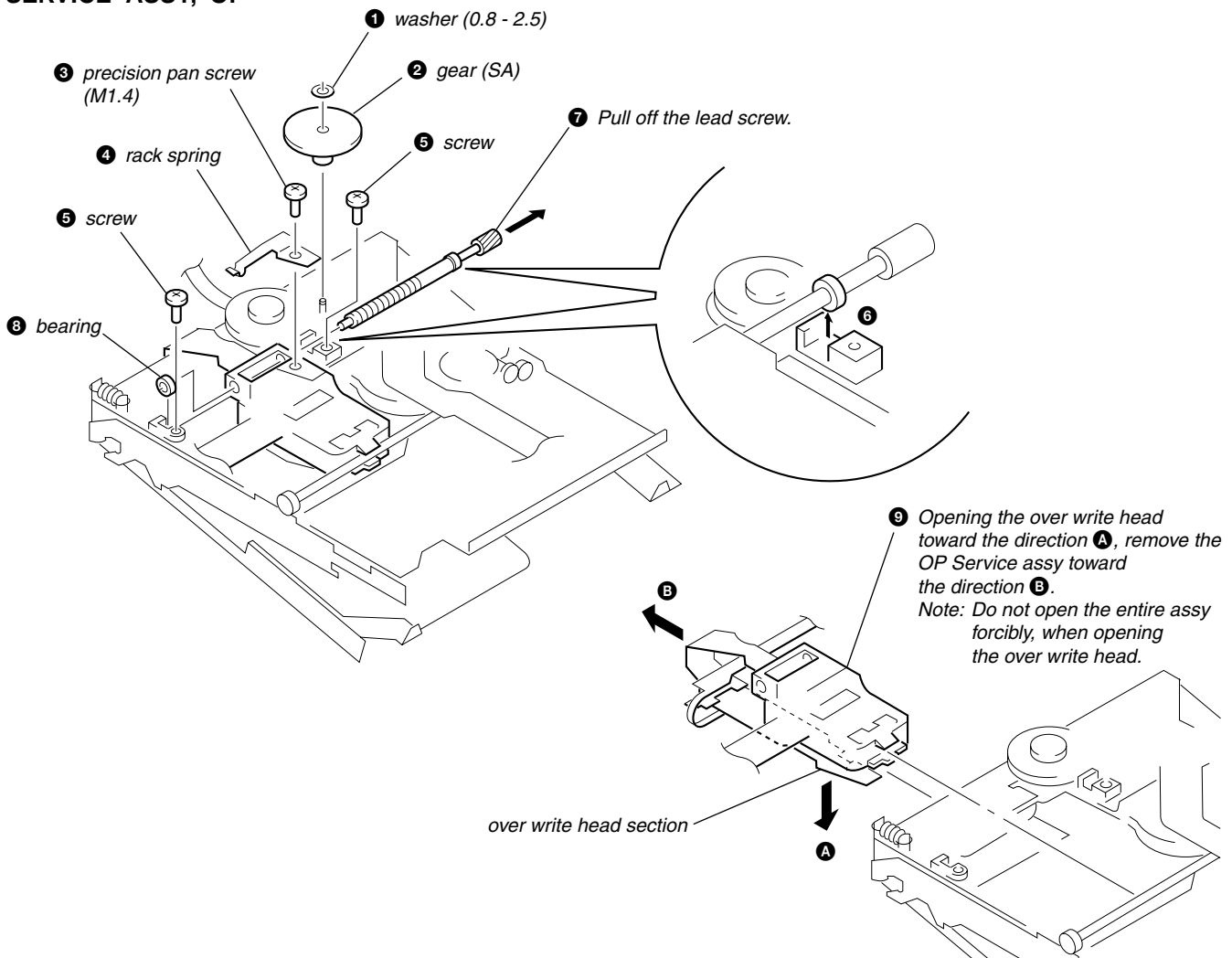
Note: As the ornamental belt assy is very fragile, do not give an excessive force to the entire assy when removing it.



**“CHASSIS ASSY, SET”, MD MECHANISM DECK (MT-MZR90-165)**

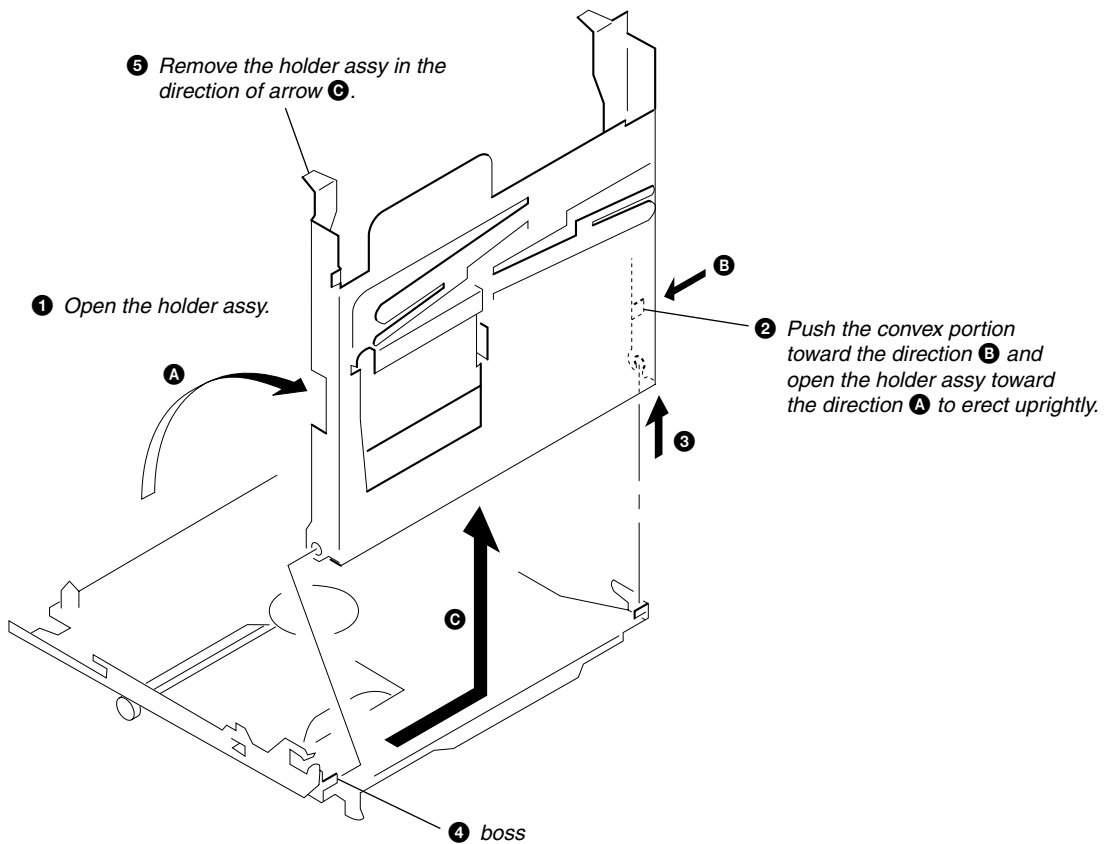


**SERVICE ASSY, OP**

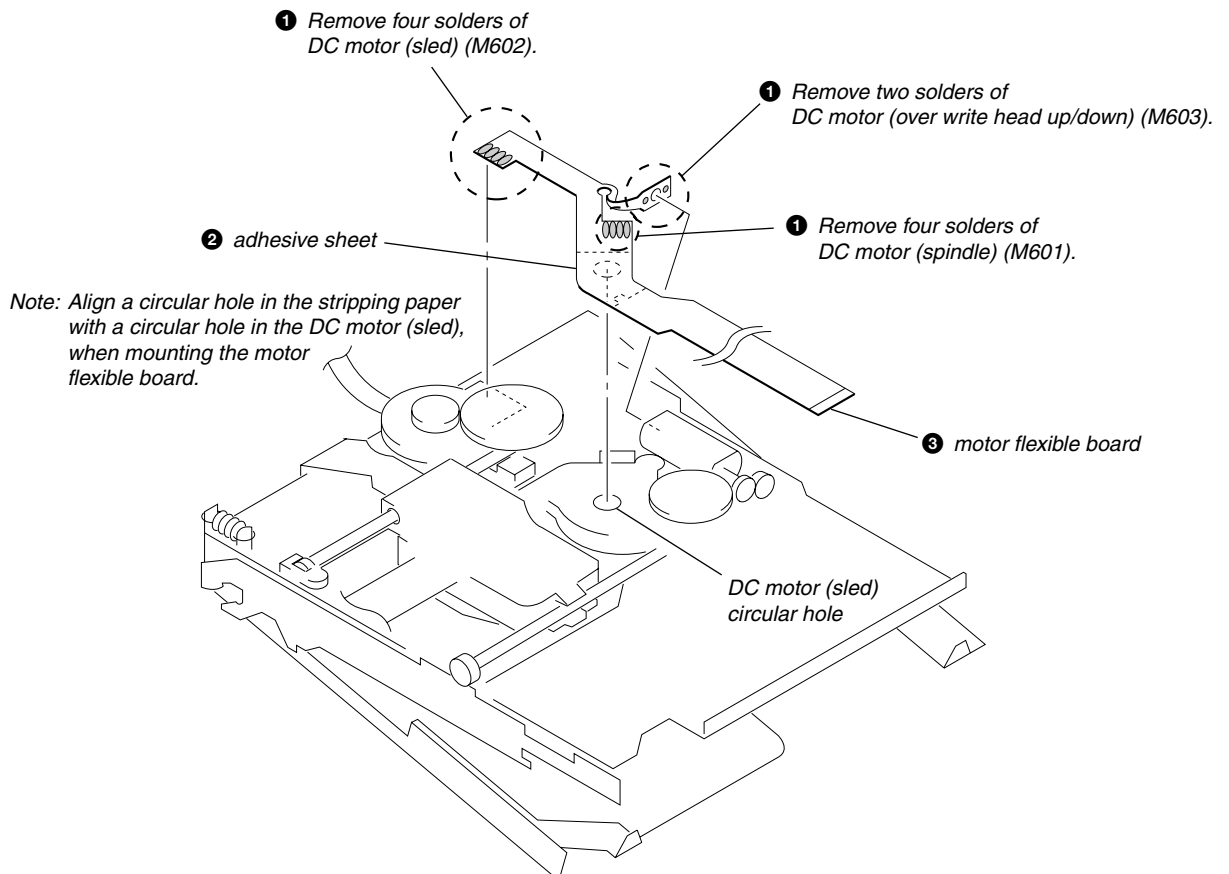




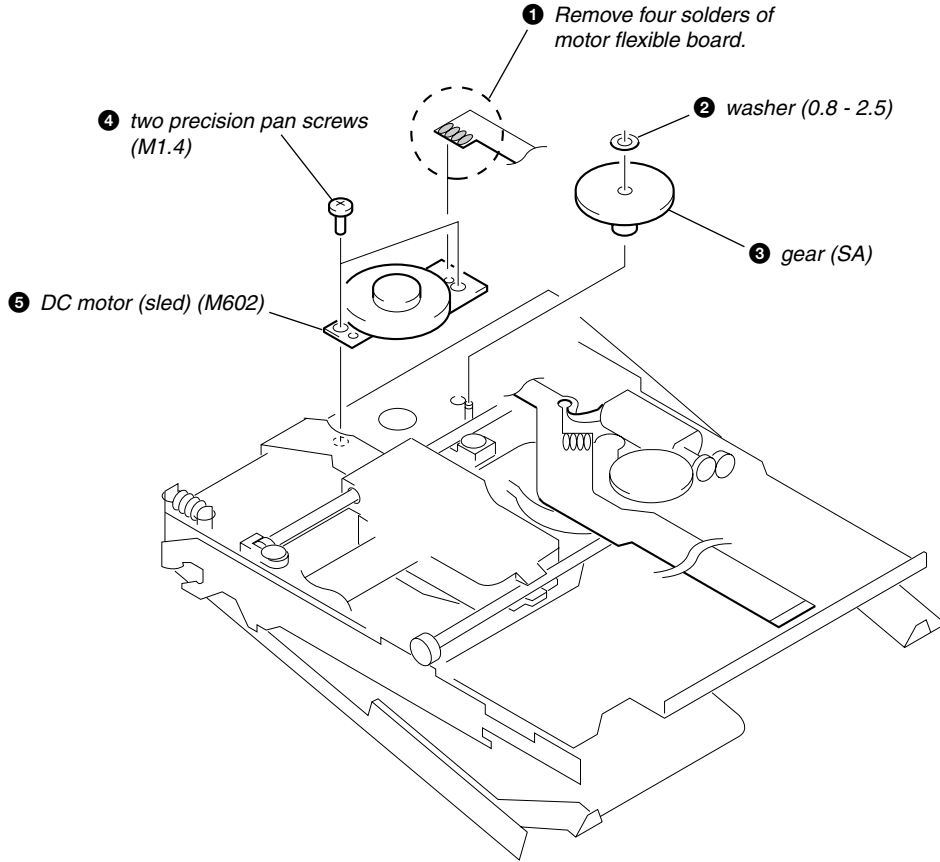
## HOLDER ASSY



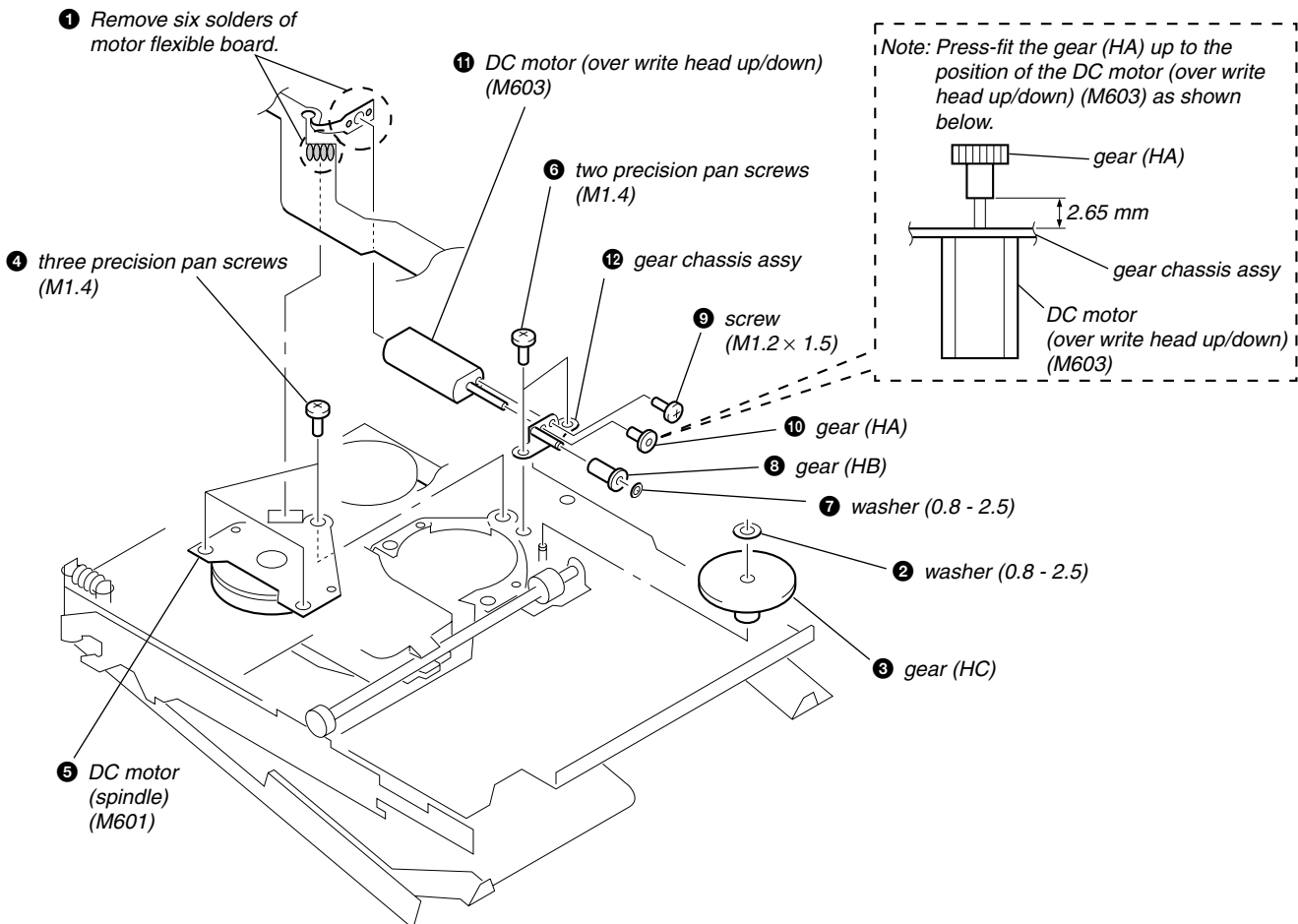
## MOTOR FLEXIBLE BOARD



**MOTOR, DC (SLED) (M602)**

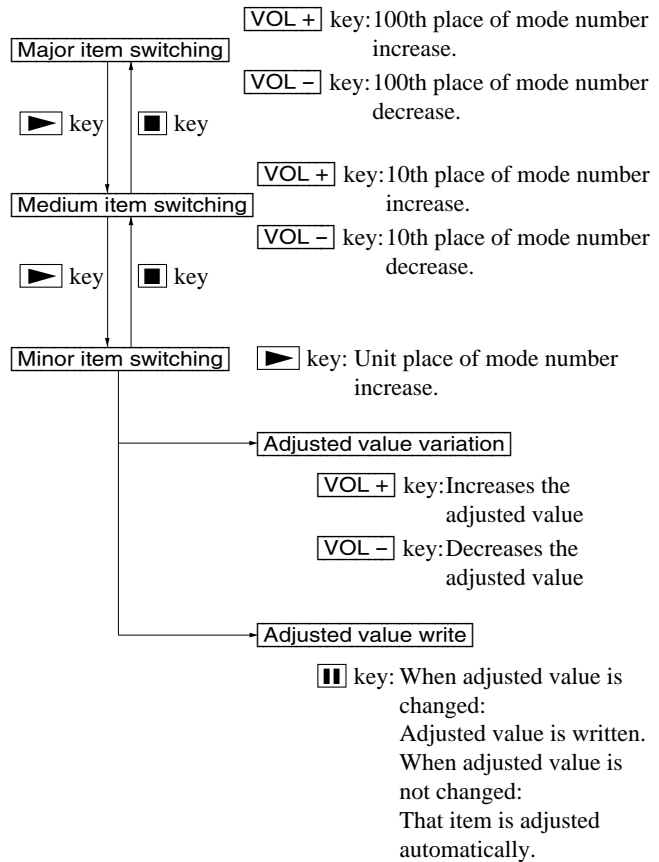
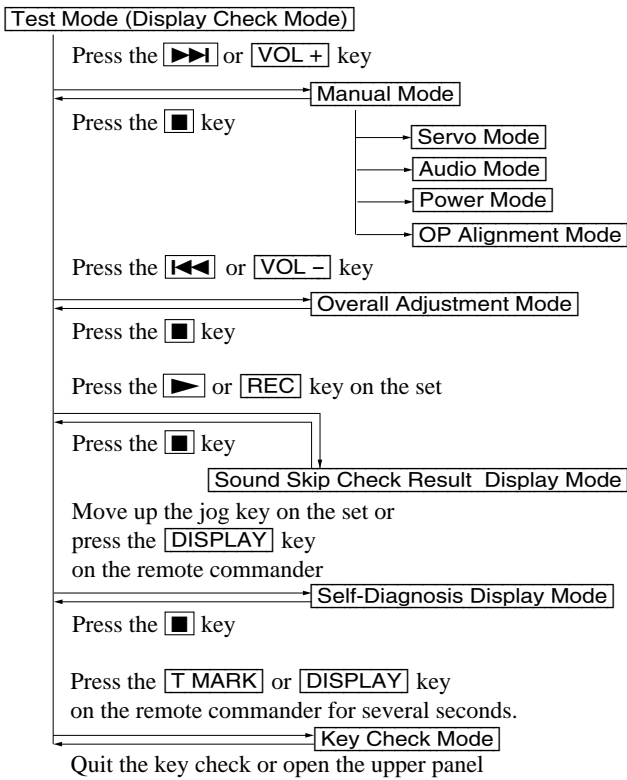


**“MOTOR, DC SSM-01C14A (SPINDLE) (M601)”**  
**“MOTOR, DC (OVER WRITE HEAD UP/DOWN) (M603)”**





## [Configuration of Test Mode]



## [Manual Mode]

Mode to adjust or check the operation of the set by function. Normally, the adjustment in this mode is not executed.

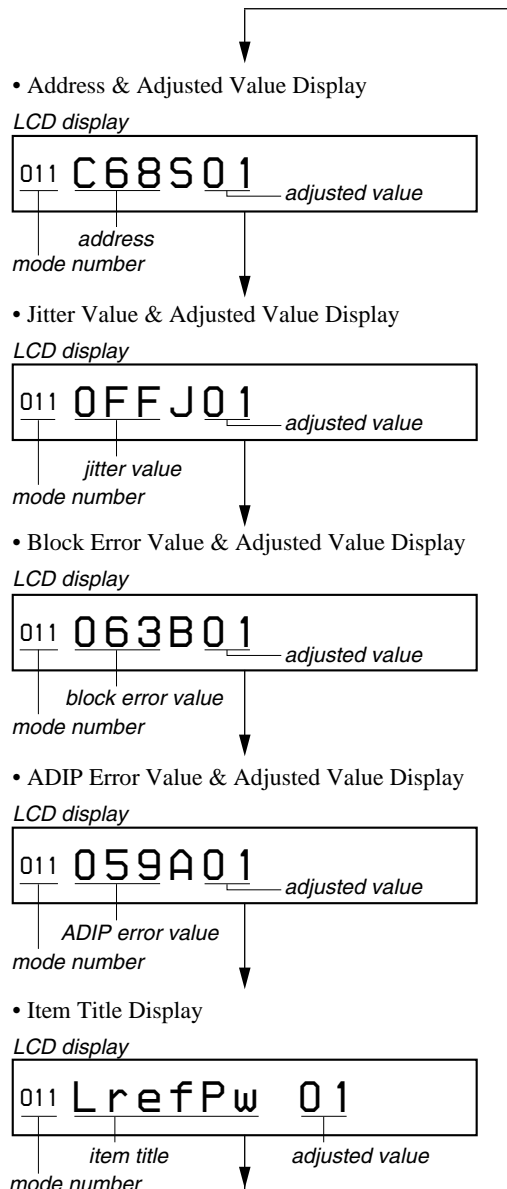
- Transition method in Manual Mode
1. Setting the test mode. (See page 11)
  2. Press the [▶▶] or [VOL +] key activates the manual mode where the LCD display as shown below.

LCD display

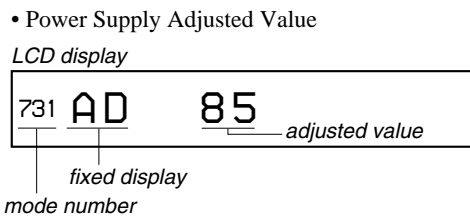
000 Manual

3. The optical pick-up moves outward or inward while the [▶▶] or [◀◀] key is pressed for several seconds respectively.
4. Each test item is assigned with a 3-digit mode number; 100th place is a major item, 10th place is a medium item, and unit place is a minor item.

5. The display changes as shown below each time the jog key on the set is turned up or [DISPLAY] key on the remote commander is pressed.



However in the power mode (mode number 700's), only the power adjustment value is displayed.



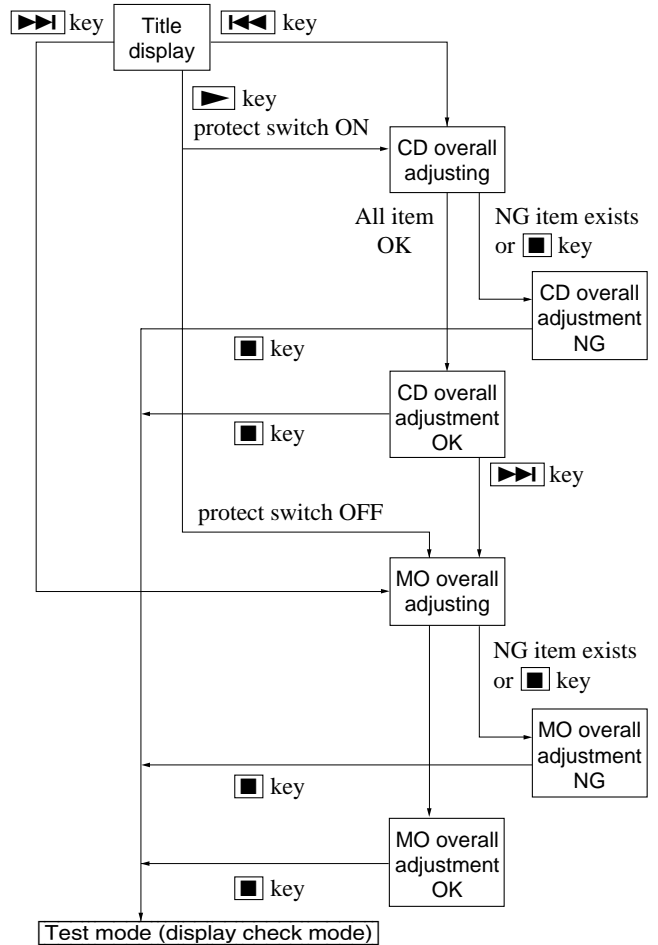
6. Quit the manual mode, and press [ ] key to return to the test mode (display check mode).

### [Overall Adjustment Mode]

Mode to adjust the servo automatically in all items. Normally, automatic adjustment is executed in this mode at the repair.

Adjust the CD first, when performing adjustment.

- Configuration of overall adjustment



For further information, refer to the Section 5 Electrical Adjustment. (See page 18)

## [Sound Skip Check Result Display Mode]

This set can display and check the error count occurring during record and play.

### • Setting method of Sound Skip Check Result Display Mode

1. Setting the test mode. (See page 11)
2. Press the **[▶]** or **[REC]** key on the set activates the sound skip check result display mode where the LCD displays as shown below.

If microprocessor version is 1.20

When **[▶]** key is pressed:

LCD display

```
000 Stat**
```

Total of play system error count

When **[REC]** key on the set is pressed:

LCD display

```
000 Rtry**
```

Total of record system error count

If microprocessor version is 1.30 or later

When **[▶]** or **[REC]** key on the set is pressed:

LCD display

```
000 P**R**
```

Total of record system error count

Total of play system error count

3. When **[▶]** key is pressed, the total of error count is displayed on the LCD, and each time the **[▶▶]** key is pressed, the error count descends one by one as shown below. Also, when **[◀◀]** key is pressed, the error count ascends by one. If **[REC]** key on the set is pressed, the error count during record is displayed.

If microprocessor version is 1.20.

```
000 Stat**
  ↑
000 BEmp**
  ↑
000 #####
  ↑
000 EIB **
  ↑
```

If microprocessor version is 1.30 or later.

```
000 P**R**
  ↑
000 EIB **
  ↑
000 Stat**
  ↑
000 Adrs**
  ↑
000 BEmp**
  ↑
000 #####
  ↑
```

\*\* : Sound skip check items counter (hexadecimal)

##### : 6-digit address (hexadecimal) where a sound skipped last

4. When **[REC]** key on the set is pressed, the total of error count is displayed on the LCD, and each time the **[▶▶]** key is pressed, the error count descends one by one as shown below. Also, when **[◀◀]** key is pressed, the error count ascends by one. If **[▶]** key is pressed, the error count during play is displayed.

If microprocessor version is 1.20.

```
000 Rtry**
  ↑
000 #####
  ↑
000 BOvr**
  ↑
000 Bful**
  ↑
```

If microprocessor version is 1.30 or later.

```
000 P**R**
  ↑
000 BOvr**
  ↑
000 Bful**
  ↑
000 Rtry**
  ↑
000 #####
  ↑
```

\*\* : Sound skip check items counter (hexadecimal)

##### : 6-digit address (hexadecimal) where a sound skipped last

Error code

	Cause of error	Description of error
Playback	EIB	Sound error correction error
	Stat	Decoder status error
	Adrs	Cannot access the address
	BEmp	Buffer becomes empty
Recording	BOvr	Buffer becomes full and sounds are dumped
	BFul	Buffer capacity lowers and data are forcibly written
	Rtry	Retry count over

5. Quit the sound skip check result display mode, and press the **[■]** key to return to the test mode (display check mode).

### [Self-Diagnosis Display Mode]

- This set uses the self-diagnosis system in which if an error occurs in recording/playback mode, the error is detected by the model control and power control blocks of the microprocessor and information on the cause is stored as history in EEPROM. By viewing this history in test mode, it helps you to analyze a fault and determine its location.

Total recording time has been recorded as optical pick-up using time, and it is compared with the total recording time in the self-diagnosis display mode to find when an error occurred.

Clear both total recording time and the time in self-diagnosis display mode, when the optical pick-up was replaced.

1. Setting the test mode. (See page 11)
2. Move up the jog key on the set or press the **[DISPLAY]** key on the remote commander activates the self-diagnosis display mode where the LCD display as shown below.

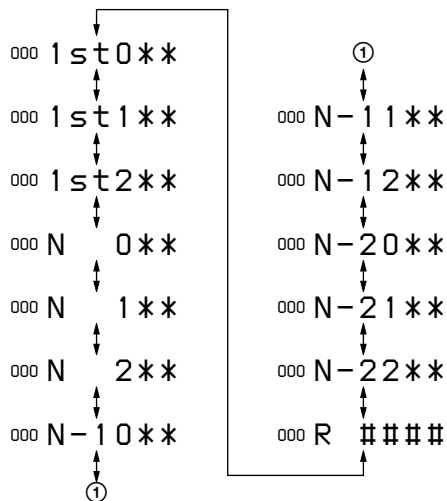
LCD display

```
000 1st0**
```

history code

\*\* : Self-Diagnosis Data

3. Then, each time **[▶▶]** key is pressed, LCD display descends by one as shown below. Also, the LCD display ascends by one when **[◀◀]** key is pressed.



4. Quit the self-diagnosis display mode, and press the **[■]** key to return to the test mode (display check mode).

### • Description of Indication History

History code number	Description
1st0	The first error
1st1	Total recording time when 1st0 was generated (Higher rank byte)
1st2	Total recording time when 1st0 was generated (Lower rank byte)
N 0	The last error
N 1	Total recording time when N 0 was generated (Higher rank byte)
N 2	Total recording time when N 0 was generated (Lower rank byte)
N-10	One error before the last.
N-11	Total recording time when N-10 was generated (Higher rank byte)
N-12	Total recording time when N-10 was generated (Lower rank byte)
N-20	Two errors before the last.
N-21	Total recording time when N-20 was generated (Higher rank byte)
N-22	Total recording time when N-20 was generated (Lower rank byte)
REC	Total recording time *

\* Total recording time  
Total recording time is recorded in minutes. It is recorded in hexadecimal format and up to 65,535 min. can be counted. It returns to "0000h" when recorder goes beyond this limit.

### • Description of Error Indication Codes

Problem	Indication code	Meaning of code	Description
No error	00	No error	
Servo error	01	Illegal access target address was specified	Attempt to access an abnormal address
	02	High temperture	High temperture
	03	Focus error	Forcus could not be applied
	04	Spindle error	Abnormal lotation of disc
Power error	21	Initial low battery	Abnormal voltage at initialization
	22	Low battery	Momentary interruption detected
	23	Low battery NI	Momentary interruption detected (NiMH)
	24	Low battery AM	Momentary interruption detected (AM)

### [Clearing Self-Diagnosis Data and Total Recording Time]

1. Setting the test mode. (See page 11.)
2. Move up the jog key on the set or press the **[DISPLAY]** key on the remote commander activates the self-diagnosis display mode.
3. Press the **[II]** key or **[REC]** key on the set during display of self-diagnosis data when clearing the self-diagnosis data, or during display of total recording time when clearing the total recording time. Thus, "ClrOK?" will be displayed on the LCD, and press the same key again, and when self-diagnosis data is cleared "ErrCLR" is displayed and the data is cleared. Also when total recording time is cleared, "ReeT O" is displayed and it is cleared.



## [Key Check Mode]






This set can check if the set and remote commander function normally.

- Setting Method of Key Check Mode





1. Setting the test mode. (See page 11)
2. Press the **T MARK** or **DISPLAY** key on the remote commander for several seconds activates the key check mode where all segments of LCD turn OFF. (At the last two digits of DOT section, AD value of remote commander key line is displayed in hexadecimal)
3. When each key is pressed, it is displayed on the LCD, implying that it was successfully checked as shown below. However, for the slide switch on the set, it is not checked unless it is reciprocated.

\* The key pressed to enter the key check mode was already checked at that time.

### Set key

Key	Indication
	PLAY
	FF
	FR
	PAUSE
VOL +	VOL +
VOL -	VOL -
	STOP
REC	REC
END SEARCH	END S
Jog (up)	JOG+
Jog (down)	JOG-
Jog (push)	PUSH
T MARK	T MARK
HOLD (hold)	HLDOn
HOLD (off)	HLDoff
SYNCHRO REC (on)	SYCon
SYNCHRO REC (off)	SYCoff

### Remote commander key

Key	Indication
	rPLAY
	rFR
	rPAUSE
VOL +	rVOL +
VOL -	rVOL -
	rSTOP
PLAYMODE	rPMODE
DISPLAY	rDISP

4. The test mode (display check mode) is automatically activated when all keys on the set and remote commander were checked (see above). Also, the test mode (display check mode) gets back if opening the upper panel during a key check.

# SECTION 5 ELECTRICAL ADJUSTMENTS

### [Outline]

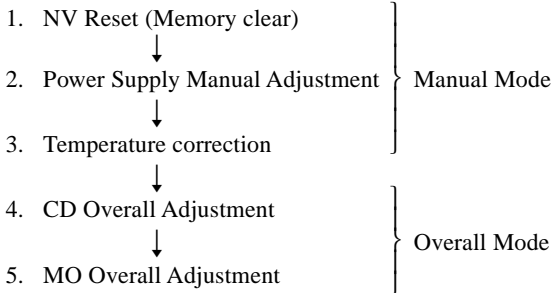
- In this set, automatic adjustment of CD and MO can be performed by entering the test mode. (See page 11)  
However, before starting automatic adjustment, the memory clear, power adjustment and temperature adjustment must be performed in the manual mode.
- The keys in the description refer to the keys on both set and remote commander unless otherwise specified.  
Though LCD display shows the LCD of the remote commander, same contents are also displayed on the LCD of the set.

### [Precautions for Adjustment]

1. Adjustment must be done in the test mode only.  
After adjusting, release the test mode.
2. Use the following tools and measuring instruments.
  - Test CD disc TDYS-1  
(Part No. : 4-963-646-01)
  - SONY MO disc available on the market.
  - Laser power meter LPM-8001  
(Part No. : J-2501-046-A)
  - Digital voltmeter
3. Unless specified otherwise, supply DC 3V from the DC IN 3V jack.
4. Switch position  
HOLD switch ..... OFF

### [Adjustment Sequence]

Adjustment must be done with the following steps.

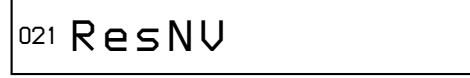


### [NV Reset]

#### • Setting method of NV reset

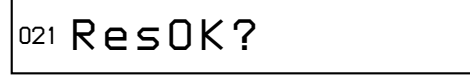
1. Select the manual mode of test mode, and set mode number 021NV Reset.

LCD display



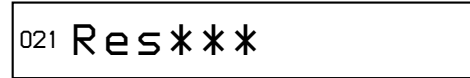
2. Press the **[HOLD]** key.

LCD display

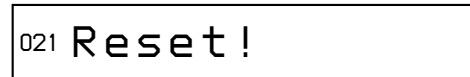


3. Press the **[HOLD]** key once more.

LCD display



↓ NV reset (after several seconds)



4. Quit the manual mode, and activate the test mode.

### [Power Supply Manual Adjustment]

#### • Adjustment sequence

Adjustment must be done with the following steps.

1. VC PWM Duty (L) adjustment (mode number: 762)  
↓
2. VREM PWM Duty (H) adjustment (mode number: 763)  
↓
3. VREM PWM Duty (L) adjustment (mode number: 764)  
↓
4. VC PWM Duty (H) adjustment (mode number: 765)  
↓
5. VREM PWM Duty (H) adjustment (mode number: 766)  
↓
6. VREM PWM Duty (L) adjustment (mode number: 767)

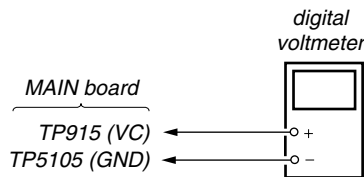
• **Adjustment method of VC PWM Duty (L)**  
(mode number: 762)

1. Select the manual mode of the test mode, and set the mode number 762. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP915 (VC) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.5 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.

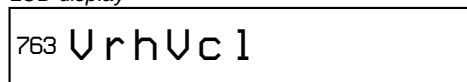


3. Press the [ ] key to write the adjusted value.

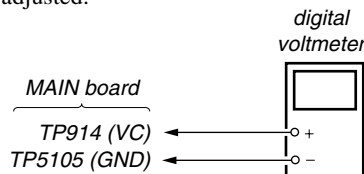
• **Adjustment method of VREM PWM Duty (H)**  
(mode number: 763)

1. Select the manual mode of the test mode, and set the mode number 763. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP914 (VR) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.75 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.

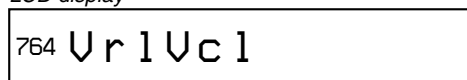


3. Press the [ ] key to write the adjusted value.

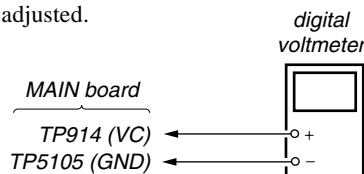
• **Adjustment method of VREM PWM Duty (L)**  
(mode number: 764)

1. Select the manual mode of the test mode, and set the mode number 764. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP914 (VR) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.5 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.



3. Press the [ ] key to write the adjusted value.

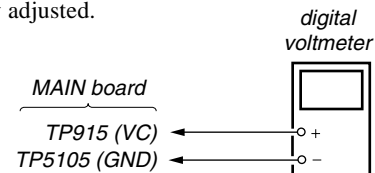
• **Adjustment method of VC PWM Duty (H)**  
(mode number: 765)

1. Select the manual mode of the test mode, and set the mode number 765. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP915 (VC) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.75 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.

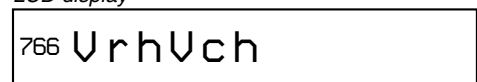


3. Press the [ ] key to write the adjusted value.

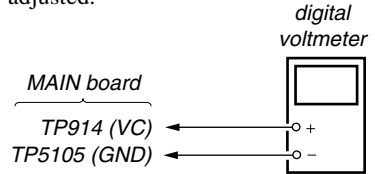
• **Adjustment method of VREM PWM Duty (H)**  
(mode number: 766)

1. Select the manual mode of the test mode, and set the mode number 766. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP914 (VR) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.75 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.

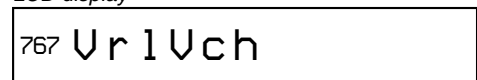


3. Press the [ ] key to write the adjusted value.

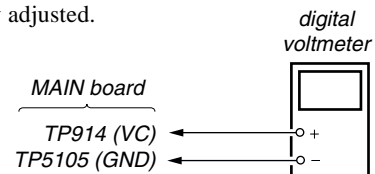
• **Adjustment method of VREM PWM Duty (L)**  
(mode number: 767)

1. Select the manual mode of the test mode, and set the mode number 767. (See page 12)

LCD display



2. Connect a digital voltmeter to the TP914 (VR) on the MAIN board, and adjust [VOL +] key (voltage up) or [VOL -] key (voltage down) so that the voltage becomes  $2.5 \pm 0.02$  V. Proceed to the next step without pressing [ ] key if voltage is already adjusted.



3. Press the [ ] key to write the adjusted value.

## [Temperature Correction]

### • Adjustment Method of temperature correction

1. Select the manual mode of test mode, and set the mode number 014. (See page 12)

LCD display

014 SetTmp

2. Measure the ambient temperature.
3. Adjust with [VOL +], [VOL -] key so that the adjusted value (hexadecimal value) becomes the ambient temperature. (Initial value: 14h = 20 °C, Adjusting range: 80h to 7fh (-128 °C to +127 °C))
4. Press the [II] key to write the adjusted value.

## [Overall Adjustment Mode]

### • Adjustment Method of Overall Adjustment Mode

1. Setting the test mode. (See page 11)
2. Press the [◀◀] or [VOL -] key activates the overall adjustment mode where the LCD display as shown below.

LCD display

000 ASSY\*\* (DISC MARK)

(DISC MARK) : (DISC MARK) When power adjustment "H" finished;  
Outward ON  
When power adjustment "L" finished;  
Inward ON

Power supply is not yet adjusted unless both outward and inward disc marks are ON.

Note: Disc mark is displayed on the remote commander LCD only.

\*\* : Left side = MO auto adjustment information  
F : Auto adjustment finished  
1 : Manual adjustment remains  
0 : Not adjusted yet  
Right side = CD auto adjustment information  
F : CD auto adjustment finished  
1 : Manual adjustment remains (not auto adjustment)  
0 : Not adjusted yet

3. Insert the CD test disc TDYS-1 (Parts No.4-963-646-01) or an available SONY CD disc.
4. Press [▶] key. The system discriminates between CD and MO and performs automatic adjustment for CD. Also, if [◀◀] key is pressed, CD is adjusted automatically.

LCD display

???: CD RUN

???: Manual mode number being executed

### • CD Automatic Adjustment item

Mode No.	Description
312	CD electrical offset adjustment
313	
314	
328	CD TWPP gain adjustment
321	CD tracking error gain adjustment
323	CD tracking error offset adjustment
332	
336	CD ABCD level adjustment
344	CD focus gain adjustment
345	CD tracking gain adjustment
521	CD two-axis sensibility adjustment
522	
341	CD focus bias adjustment

5. If the result of automatic adjustment is OK, the following display appears in the LCD:

LCD display

341 CD OK

6. If the result of automatic adjustment is NG, the following display appears in the LCD:

LCD display

### NG

### : Overall adjustment. NG mode number

7. If NG, set the manual mode. Perform automatic adjustment for the items not accepted. (See page 12)
8. If CD adjustment is OK, insert an available SONY MO disc (recorded). At this time, be sure to turn OFF the disc protect switch.
9. Press [▶] key. The system discriminates between CD and MO and performs automatic adjustment for the MO disc. Also, if [▶▶] key is pressed, MO is adjusted automatically. However, when CD adjustment is not finished, "SetCD!" is blinking on the LCD and MO adjustment is not executed.

LCD display

???: MO RUN

???: Manual mode number being executed

• MO Automatic Adjustment item

Mode No.	Description
112	MO electrical offset adjustment
113	
114	
118	
221	Lower reflection CD tracking error gain adjustment
223	Lower reflection CD tracking error offset adjustment
232	
236	Lower reflection CD ABCD level adjustment
244	Lower reflection CD focus gain adjustment
245	Lower reflection CD tracking gain adjustment
121	MO tracking error gain adjustment
122	MO tracking error offset adjustment
134	MO TWPP gain adjustment
131	MO double speed read TWPP offset adjustment
132	
136	MO ABCD level adjustment
144	MO focus gain adjustment
145	MO tracking gain adjustment
138	MO RF gain adjustment
434	MO write TWPP gain adjustment
431	MO write TWPP offset adjustment
432	
436	MO write ABCD level adjustment
445	MO write tracking gain adjustment
411	MO normal speed read TWPP offset adjustment
412	
448	32 cluster full recording
141	MO focus bias adjustment

10. If the result of automatic adjustment is OK, the following display appears in the LCD:

LCD display



11. If the result of automatic adjustment is NG, the following display appears in the LCD:

LCD display



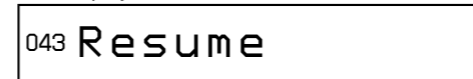
###: Overall adjustment. NG mode number

12. If NG, set the manual mode. Perform automatic adjustment for the items not accepted. (See page 12)

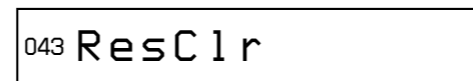
13. To clear the data in overall adjustment mode, set the manual mode and change the mode number 021 (Res NV) to reset the NV. (See page 12)

14. When both CD and MO overall adjustments are OK, set the manual mode and clear the clock data. For the microprocessor version 1.20 or later, set the mode number 043 (Resume), and press the **[II]** key.

LCD display



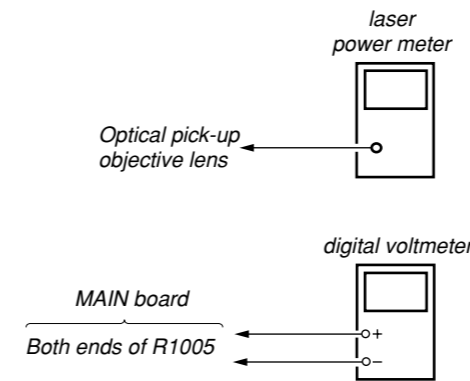
↓ Press the **[II]** key, historical data clear



**Note:** In step 10, set the clock data to 99Y11M11D11H11M00S, and in step 14, do not set the clock.

**[Laser Power Check]**

Connection :

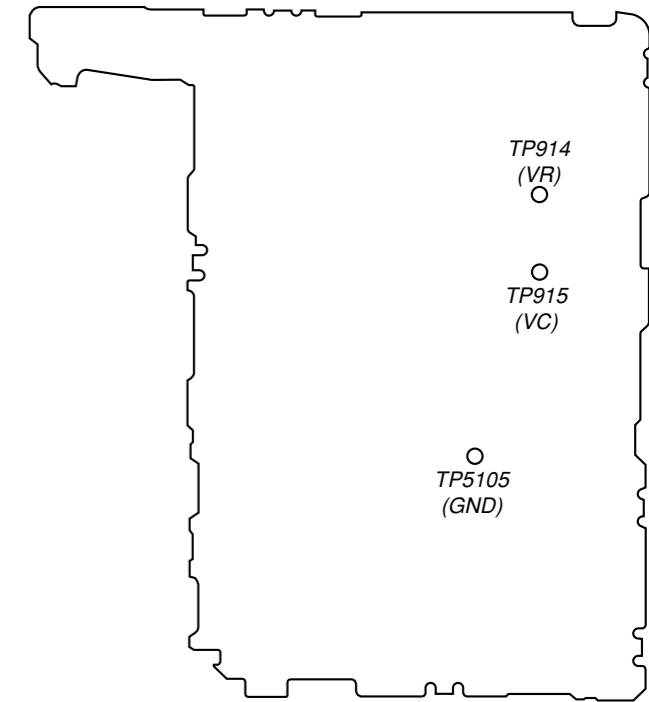


Check Method :

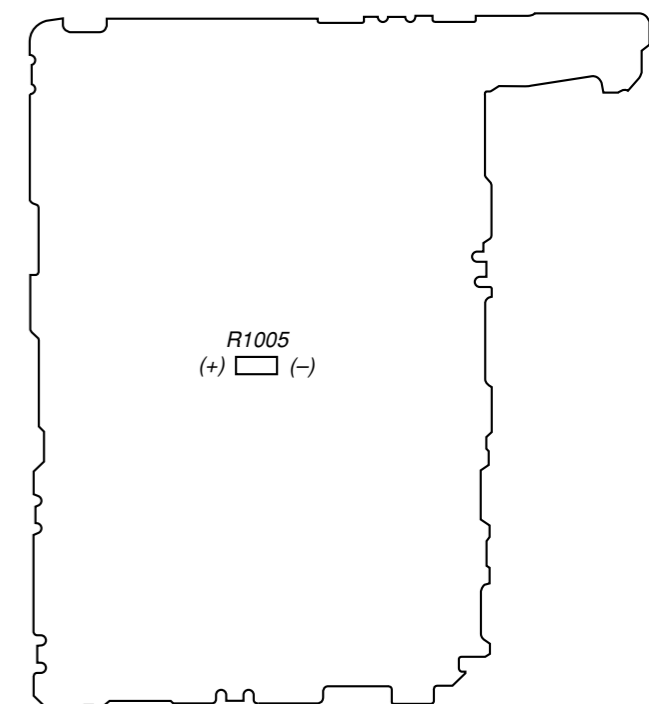
1. Select the manual mode of test mode, and set the laser power adjusting mode. (mode number 010)
2. Press the **[◀◀]** key continuously until the optical pick-up moves to the most inward track.
3. Open the cover and set the laser power meter on the objective lens of the optical pick-up.
4. Press the **[▶▶]** key, and set the laser MO read adjustment mode. (mode number 011)
5. Check that the laser power meter reading is  $0.81 \pm 0.08$  mW.
6. Check that the voltage both ends of resistor R1005 at this time is below 44 mV.
7. Press the **[▶▶]** key, and set the laser CD read adjustment mode. (mode number 012)
8. Check that the laser power meter reading is  $0.97 \pm 0.10$  mW.
9. Check that the voltage both ends of resistor R1005 at this time is below 44 mV.
10. Press the **[▶▶]** key, and set the laser MO write adjustment mode. (mode number 013)
11. Check that the laser power meter reading is  $4.95 \pm 0.50$  mW.
12. Check that the voltage both ends of resistor R1005 at this time is below 80 mV.
13. Press the **[■]** key.
14. Release the test mode.

Connecting Location:

– MAIN BOARD (Component Side) –

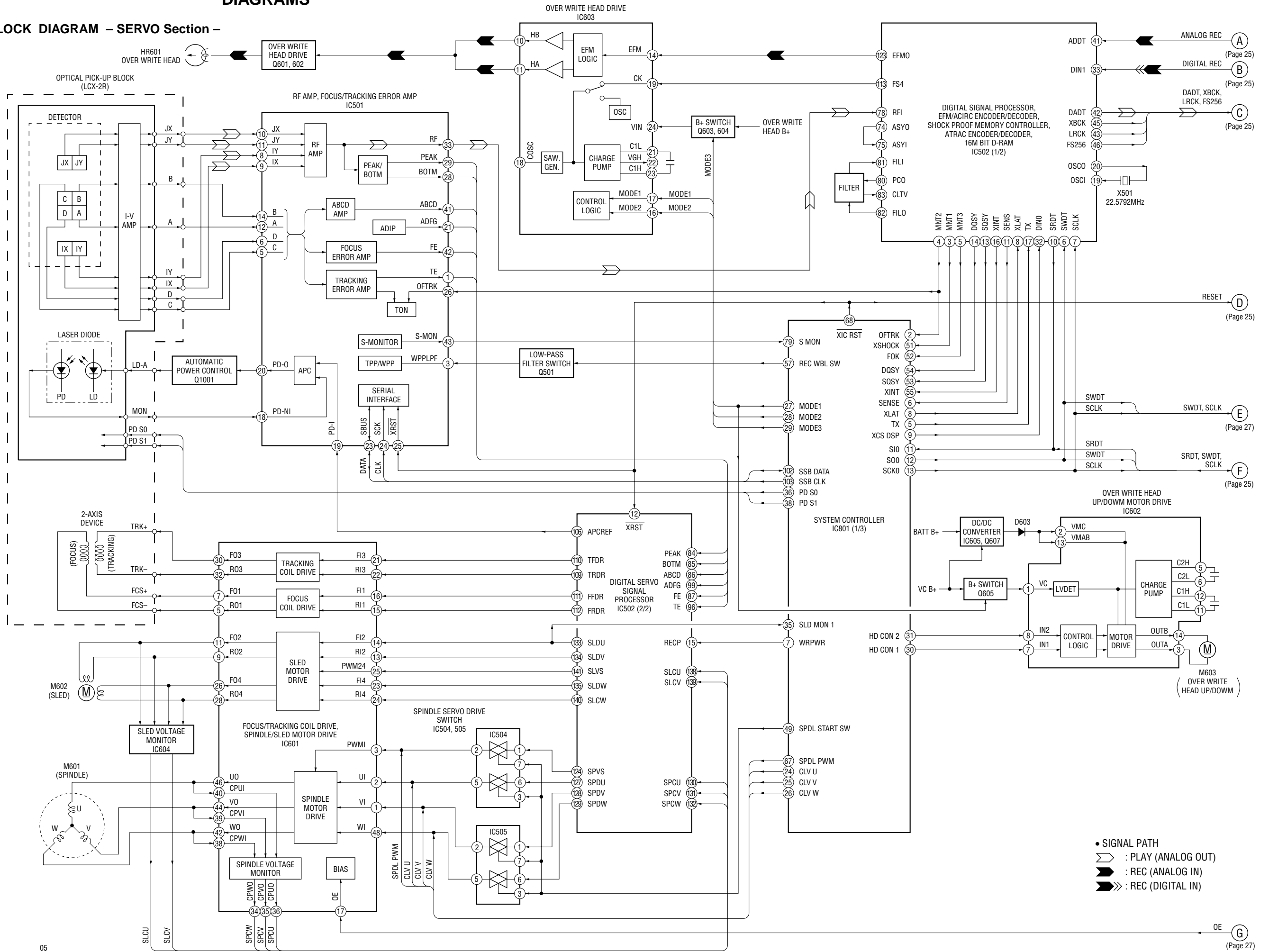


– MAIN BOARD (Conductor Side) –



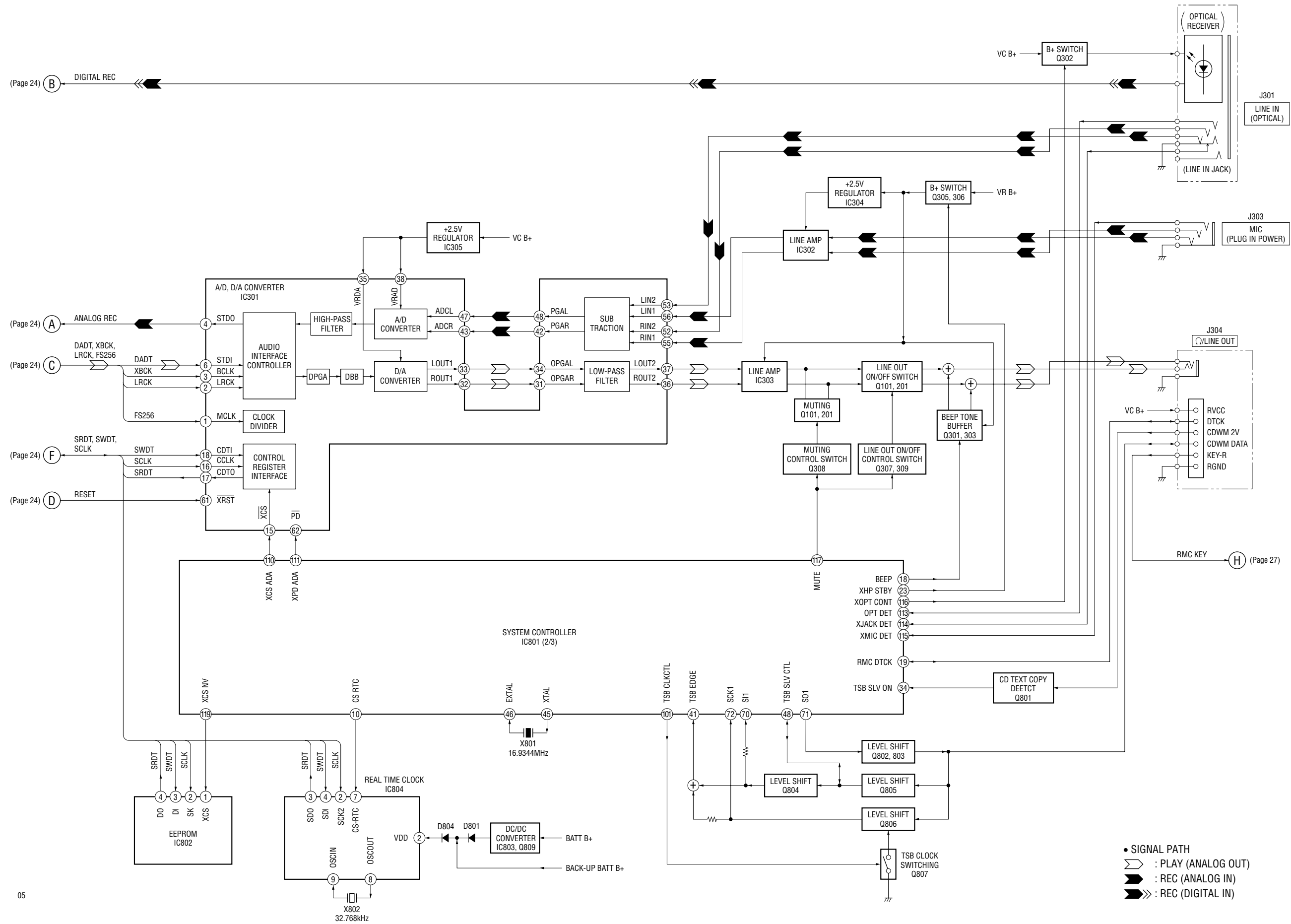
SECTION 6  
DIAGRAMS

6-1. BLOCK DIAGRAM - SERVO Section -

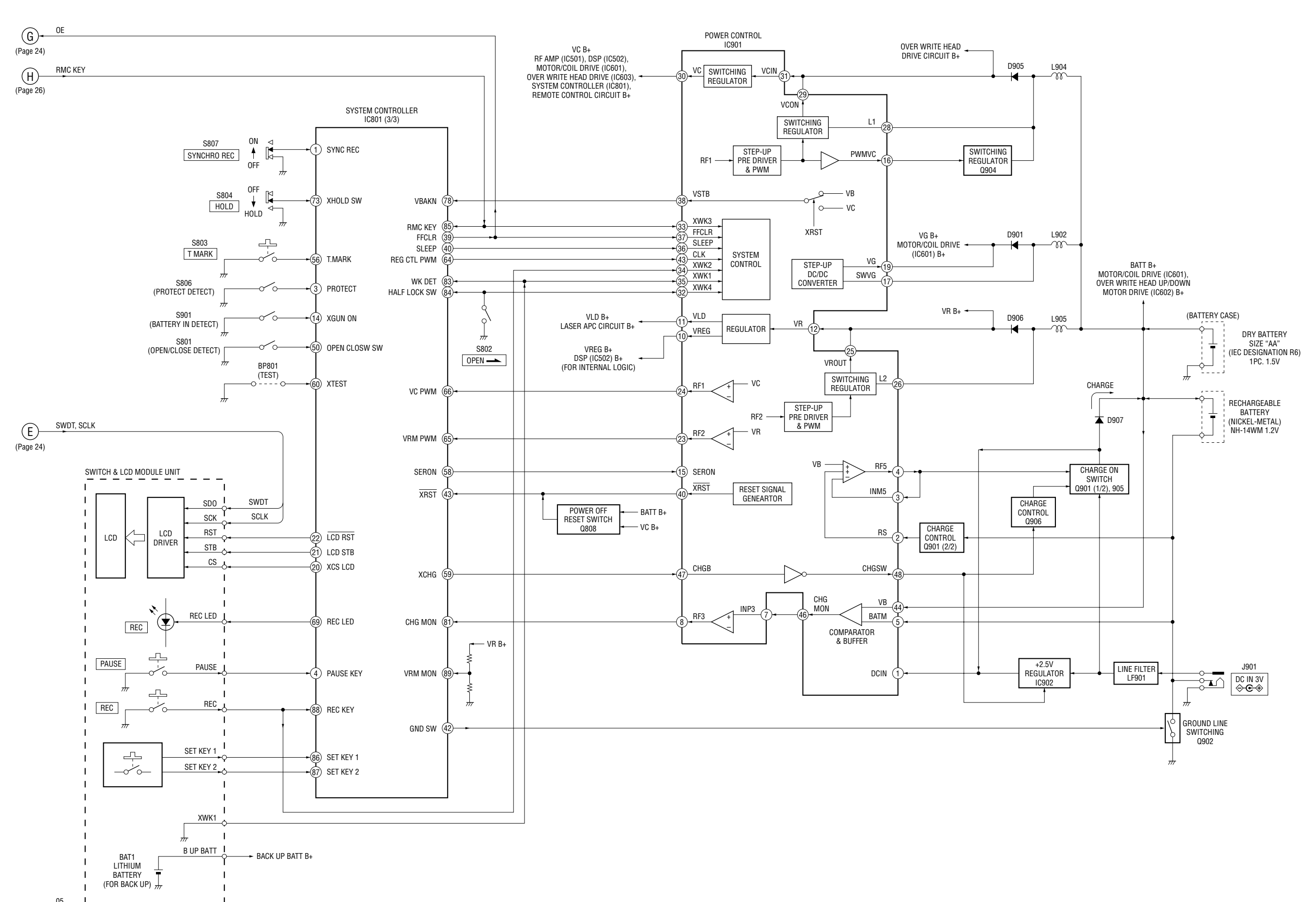


• SIGNAL PATH  
 ▷ : PLAY (ANALOG OUT)  
 → : REC (ANALOG IN)  
 ≫ : REC (DIGITAL IN)

6-2. BLOCK DIAGRAM – A/D, D/A CONVERTER, AUDIO Section –



6-3. BLOCK DIAGRAM – KEY CONTROL/DISPLAY/POWER SUPPLY Section –





6-4. PRINTED WIRING BOARD

• Semiconductor Location

Ref. No.	Location
D301	B-10
D302	B-9
D303	C-4
D304	B-10
D501	G-10
D600	F-6
D601	F-9
D602	G-6
D603	H-9
D801	E-12
D802	F-12
D803	D-11
D804	F-11
D901	D-7
D902	C-9
D903	E-9
D905	C-11
D906	C-11
D907	D-11
IC301	C-12
IC302	C-13
IC303	B-11
IC304	B-4
IC305	D-13
IC501	F-10
IC502	G-12
IC504	E-11
IC505	E-12
IC601	E-12
IC602	H-9
IC603	G-9
IC604	F-12
IC605	G-9
IC801	H-11
IC802	H-10
IC803	E-11
IC804	G-11
IC901	D-10
IC902	C-10
Q101	B-9
Q102	B-11
Q201	C-10
Q202	B-11
Q301	B-10
Q302	C-13
Q303	B-10
Q305	C-11
Q306	H-9
Q307	C-10
Q308	B-11
Q309	B-10
Q501	E-11
Q601	F-9
Q602	F-9
Q603	G-7
Q604	H-9
Q605	G-9
Q607	H-9
Q801	G-13
Q802	F-13
Q803	F-13
Q804	F-13
Q805	F-13
Q806	F-12
Q807	F-13
Q809	D-11
Q901	C-6
Q902	D-9
Q904	C-11
Q905	C-6
Q906	C-10
Q1001	E-11

**Note on Schematic Diagram:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\text{pF}$  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- % : indicates tolerance.
- $\Delta$  : internal component.
- : panel designation.

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

- : B+ Line.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : PLAYBACK
- ( ) : RECORD
- \* : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 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.
- ▶ : PLAYBACK (ANALOG OUT)
- ◀ : PLAYBACK (ANALOG IN)
- ◀▶ : RECORD (DIGITAL IN)

**Abbreviation**

- CND : Canadian model
- FR : French model
- HK : Hong Kong model
- JEW : Tourist model

\* IC502 and IC801 are not replaceable

The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different form that of conventional IC.

**Note on Printed Wiring Board:**

- : parts extracted from the component side.
- ◐ : parts extracted from the conductor side.
- : parts mounted on the conductor side.
- : Through hole.
- ▨ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

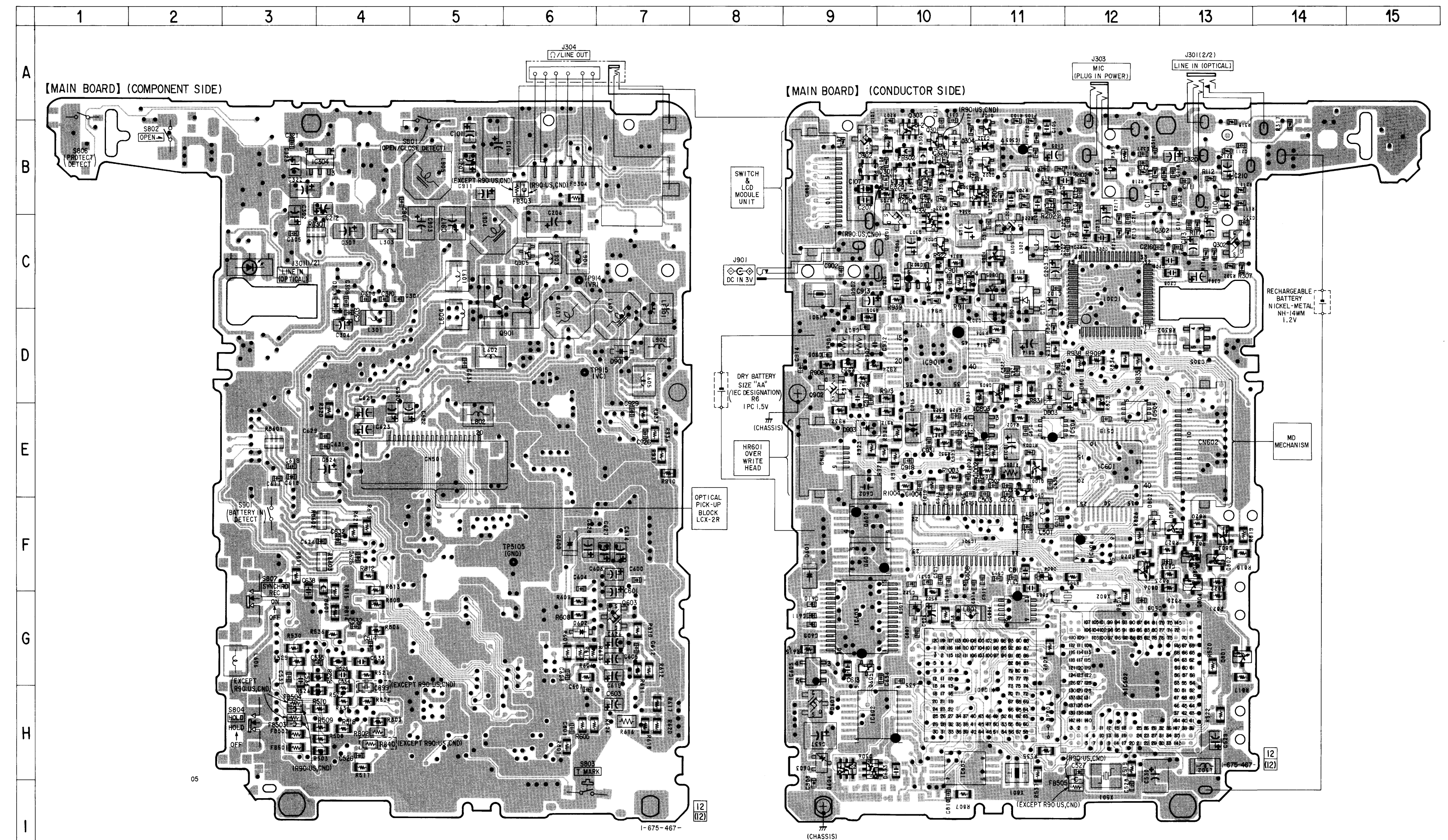
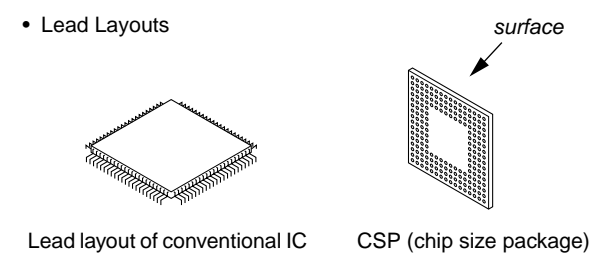
**Caution:**

Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.

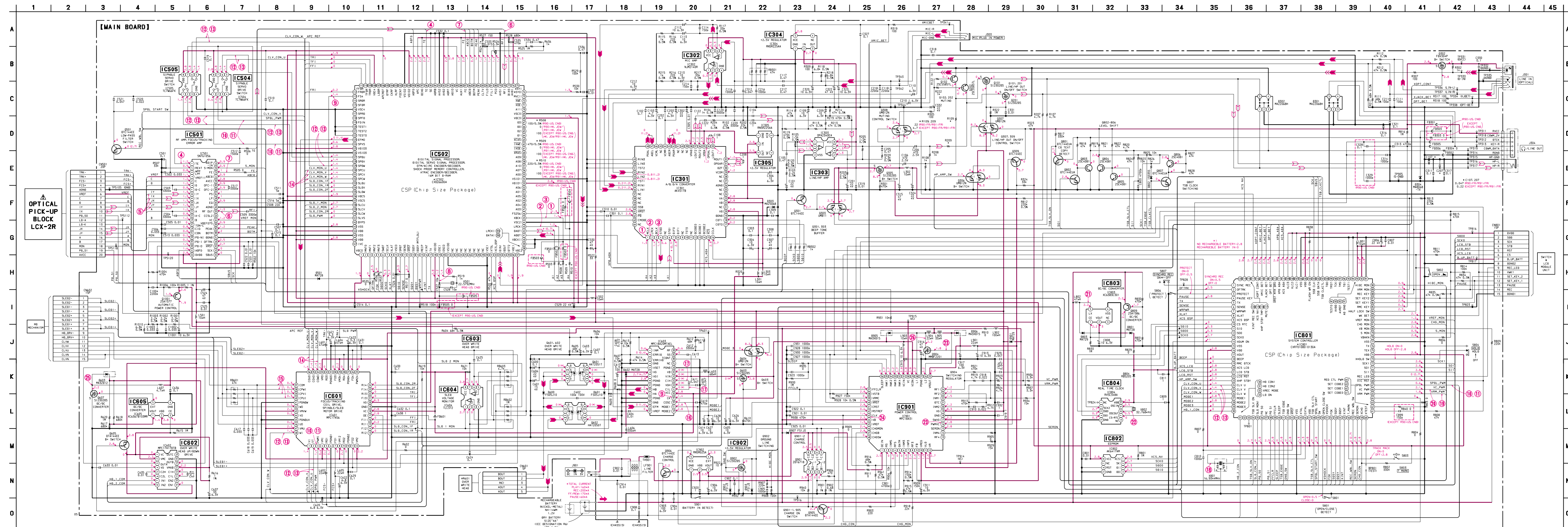
Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

Main board is four-layer printed board. However, the patterns of layers 2 and 3 have not been included in this diagrams.

\* IC502 and IC801 are not replaceable

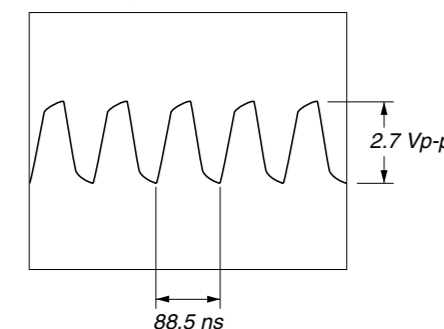




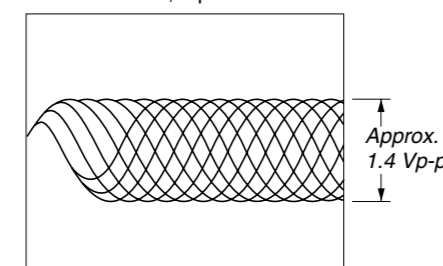


• Waveforms

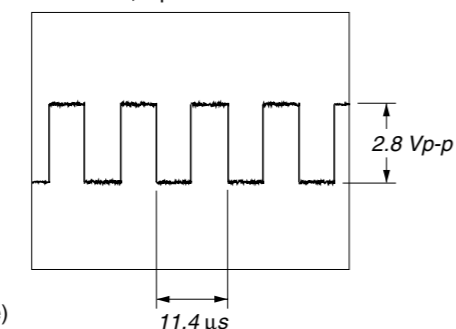
1 IC301 ① (MCLK), IC502 ④ (FS256)  
400 mV/DIV, 50 ns/DIV



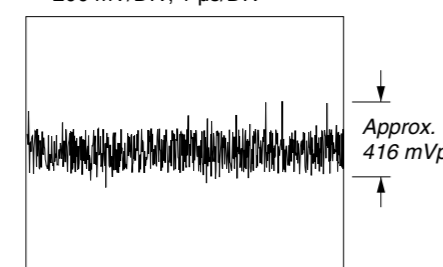
6 IC501 ③ (RF), IC502 ③ (RF) (PLAY Mode)  
400 mV/DIV, 1 μs/DIV



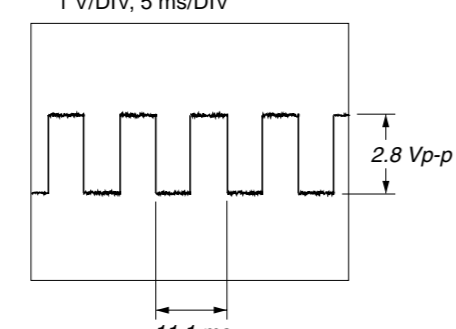
1 IC502 ③ (SPVS), IC504 ①, ②, IC601 ③ (PWM), IC801 ③ (SPDL PWM) (REC Mode)  
1 V/DIV, 5 μs/DIV



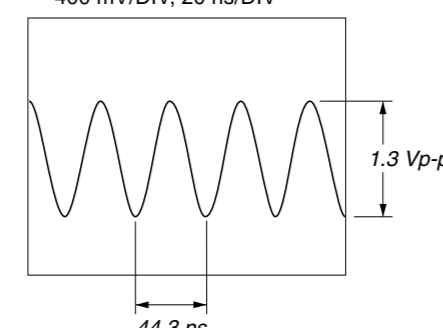
7 IC501 ④ (FE), IC502 ④ (FE) (PLAY Mode)  
200 mV/DIV, 1 μs/DIV



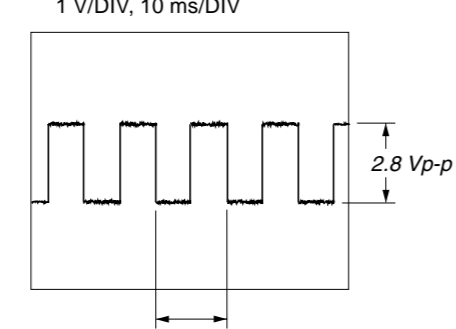
1 IC502 ④, ⑤, ⑥ (SPDU, SPDV, SPDW) IC504 ⑤, ⑥, IC505 ①, ②, ⑤, ⑥ IC601 ①, ②, ④ (VI, UI, WI) IC801 ④, ⑤, ⑥ (CLV U, CLV V, CLV W) (PLAY Mode)  
1 V/DIV, 5 ms/DIV



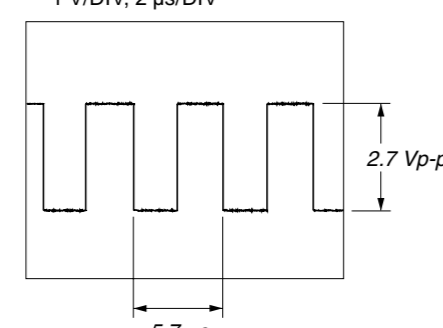
8 IC502 ④ (OSCO)  
400 mV/DIV, 20 ns/DIV



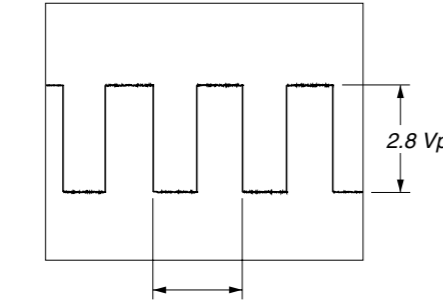
1 IC502 ④, ⑤, ⑥ (SPDU, SPDV, SPDW) IC504 ⑤, ⑥, IC505 ①, ②, ⑤, ⑥ IC601 ①, ②, ④ (VI, UI, WI) IC801 ④, ⑤, ⑥ (CLV U, CLV V, CLV W) (REC Mode)  
1 V/DIV, 10 ms/DIV



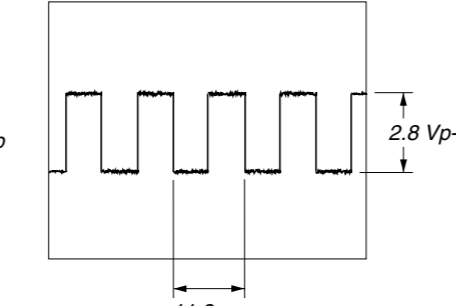
9 IC502 ④ (FS4), IC603 ④ (CK)  
1 V/DIV, 2 μs/DIV



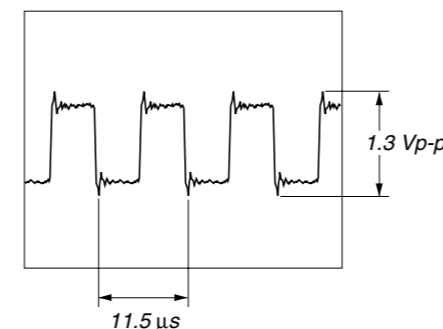
1 IC502 ④, ⑤, ⑥ (SPDU, SPDV, SPDW) IC504 ⑤, ⑥, IC505 ①, ②, ⑤, ⑥ IC601 ③ (PWM), IC801 ③ (SPDL PWM) (PLAY Mode)  
200 mV/DIV, 500 ns/DIV



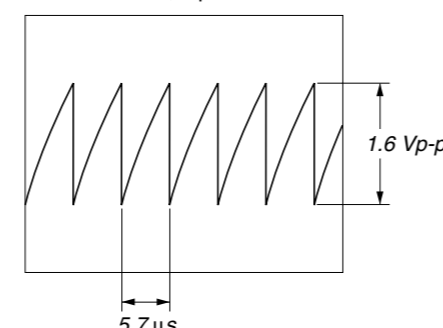
1 IC502 ④, ⑤, ⑥ (SPCU, SPCV, SPCW) IC601 ④, ⑤, ⑥ (COWO, COVO, COUO)  
1 V/DIV, 5 ms/DIV



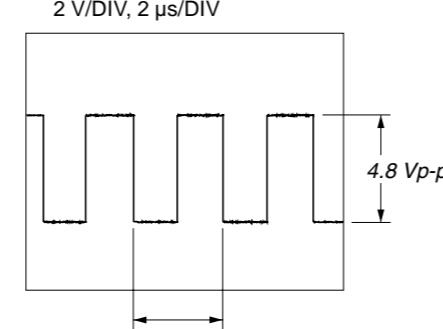
1 IC601 ④, ⑤, ⑥ (COM, CPWI, CPVI, CPU) 400 mV/DIV, 5 μs/DIV



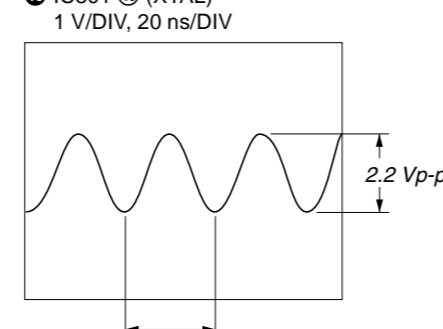
1 IC603 ④ (COSC) (REC Mode)  
400 mV/DIV, 5 μs/DIV



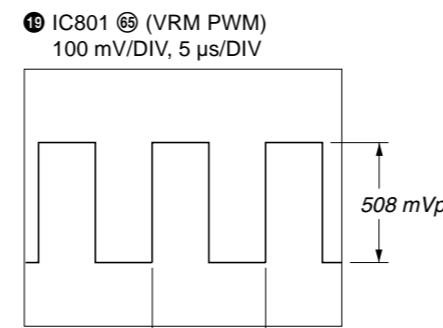
1 IC603 ④, ⑤ (CIH, CIL) (REC Mode)  
2 V/DIV, 2 μs/DIV



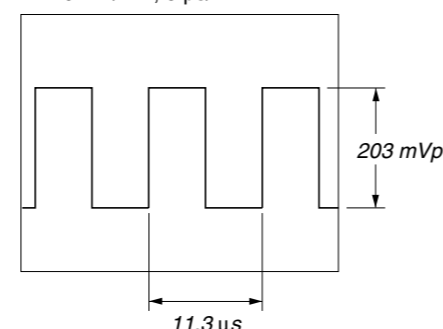
1 IC801 ④ (XTAL)  
1 V/DIV, 20 ns/DIV



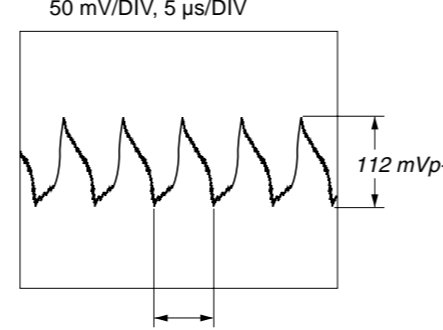
1 IC801 ④ (VRM PWM)  
100 mV/DIV, 5 μs/DIV



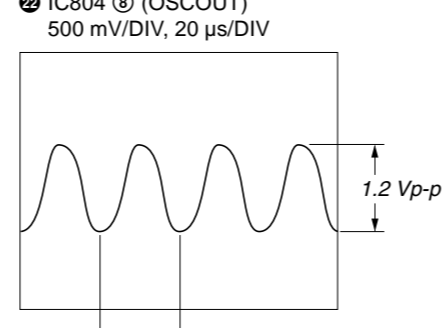
2 IC801 ④ (VC PWM)  
40 mV/DIV, 5 μs/DIV



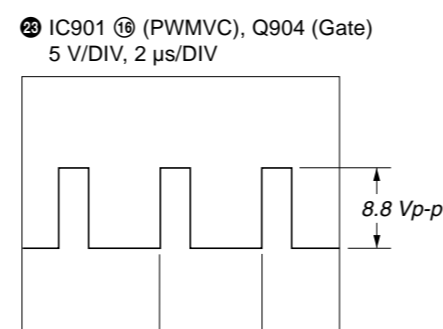
3 IC803 ④ (LX)  
50 mV/DIV, 5 μs/DIV



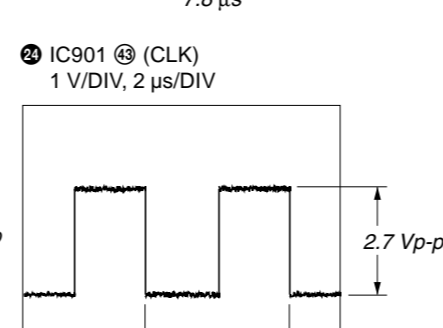
4 IC804 ④ (OSCOUT)  
500 mV/DIV, 20 μs/DIV



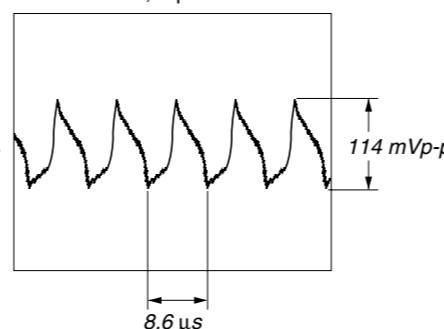
5 IC901 ④ (PWMVC), Q904 (Gate)  
5 V/DIV, 2 μs/DIV



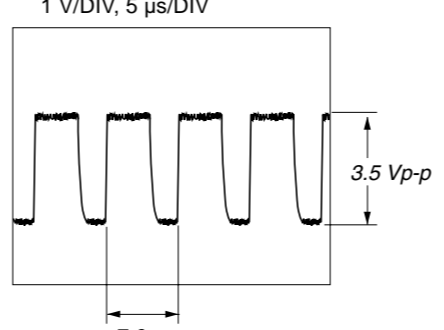
6 IC901 ④ (CLK)  
1 V/DIV, 2 μs/DIV



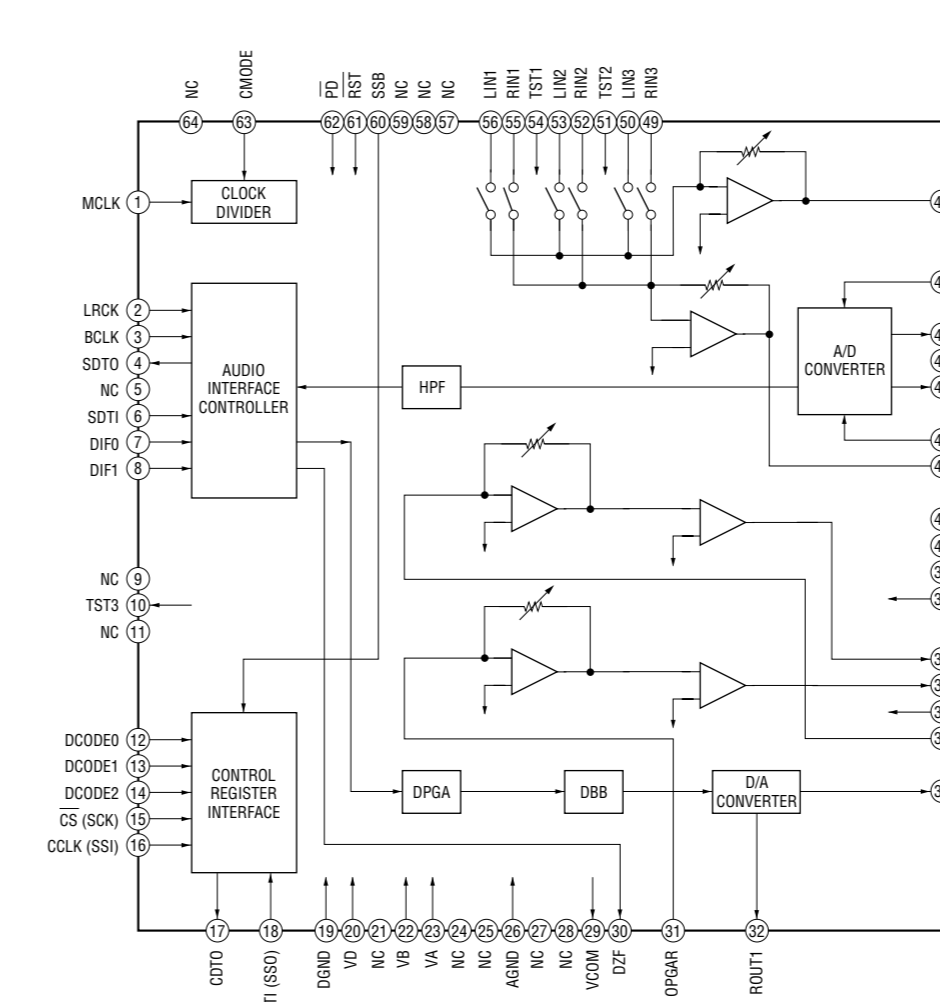
7 Q607 (Drain)  
50 mV/DIV, 5 μs/DIV



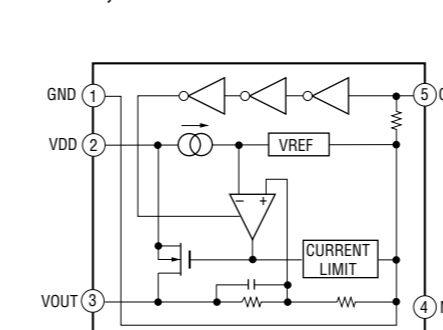
8 Q904 (Drain)  
1 V/DIV, 5 μs/DIV



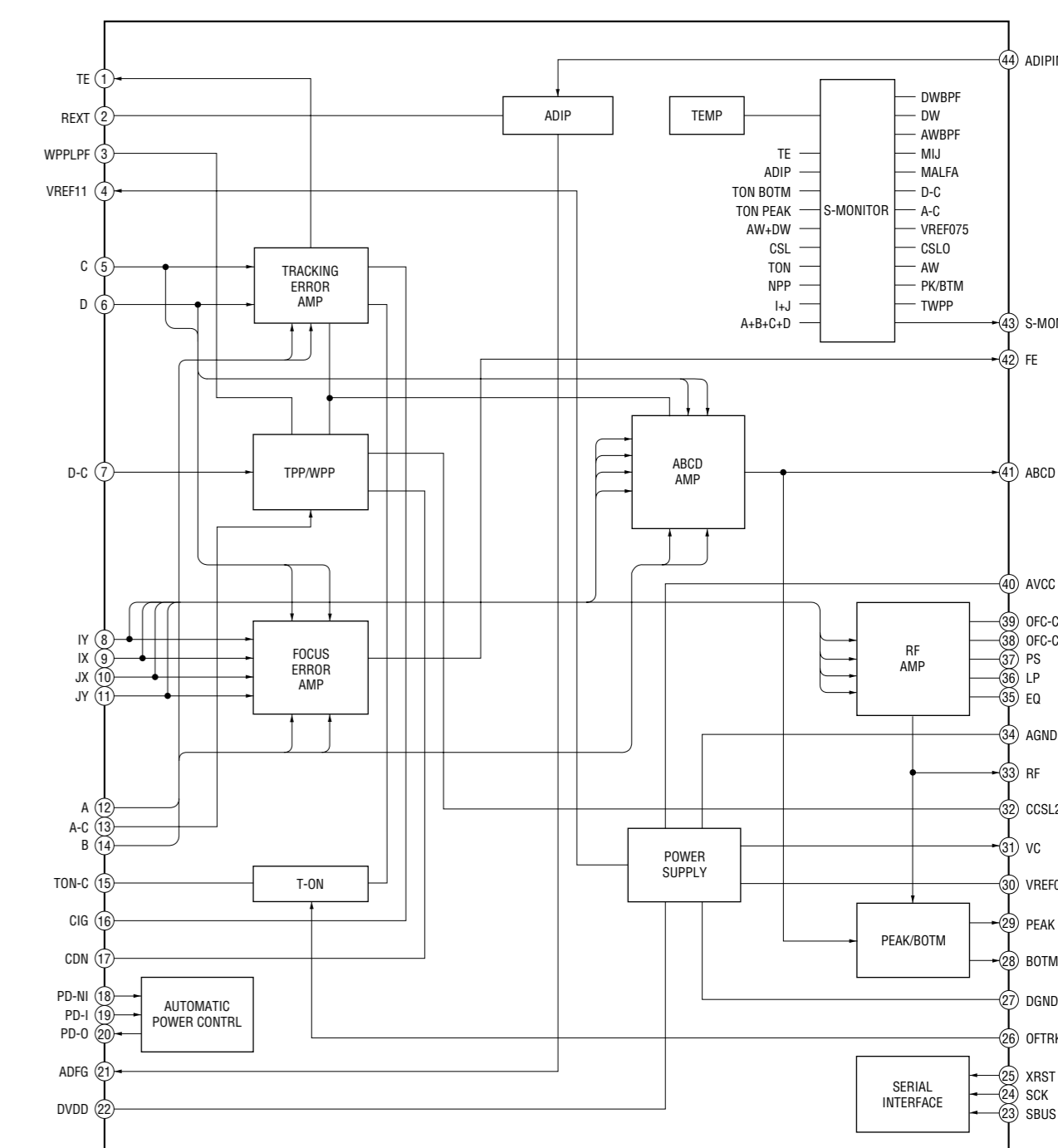
• IC Block Diagrams  
IC301 AK4517BVQ-L



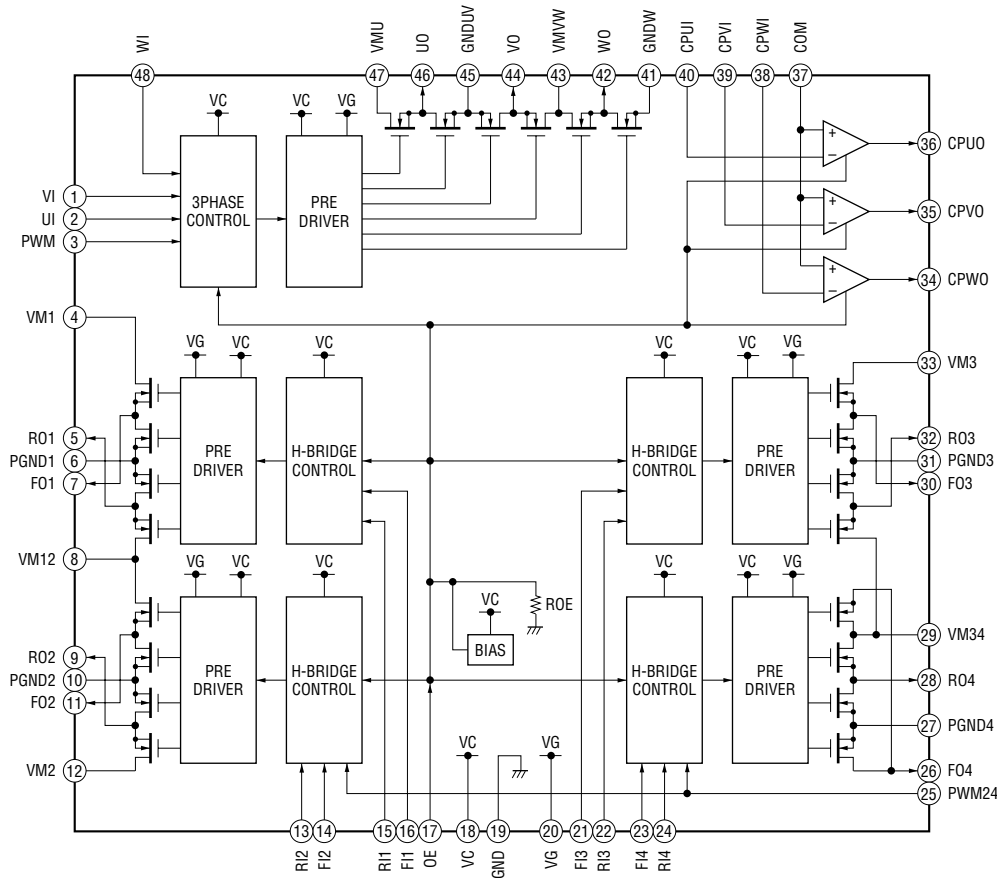
IC304, 305 RN5RZ25AA-TR



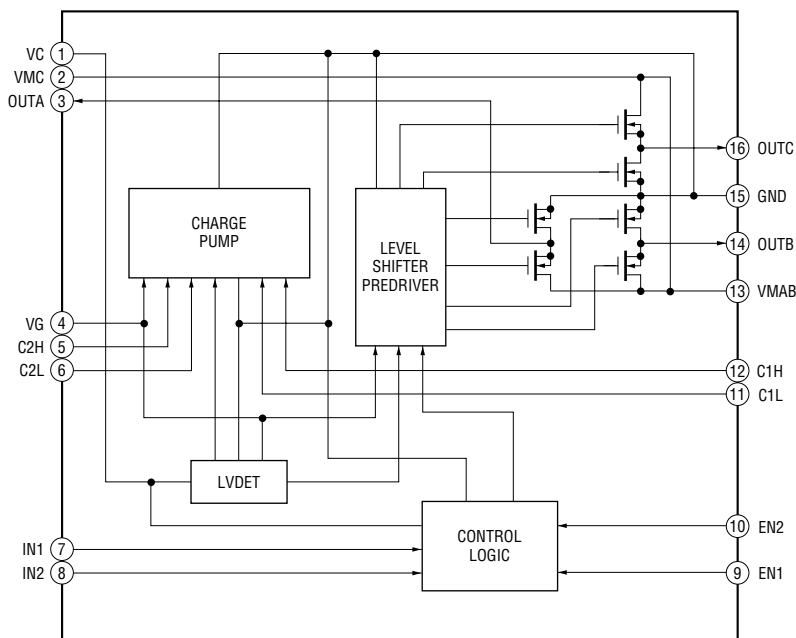
IC501 SN761056ADB



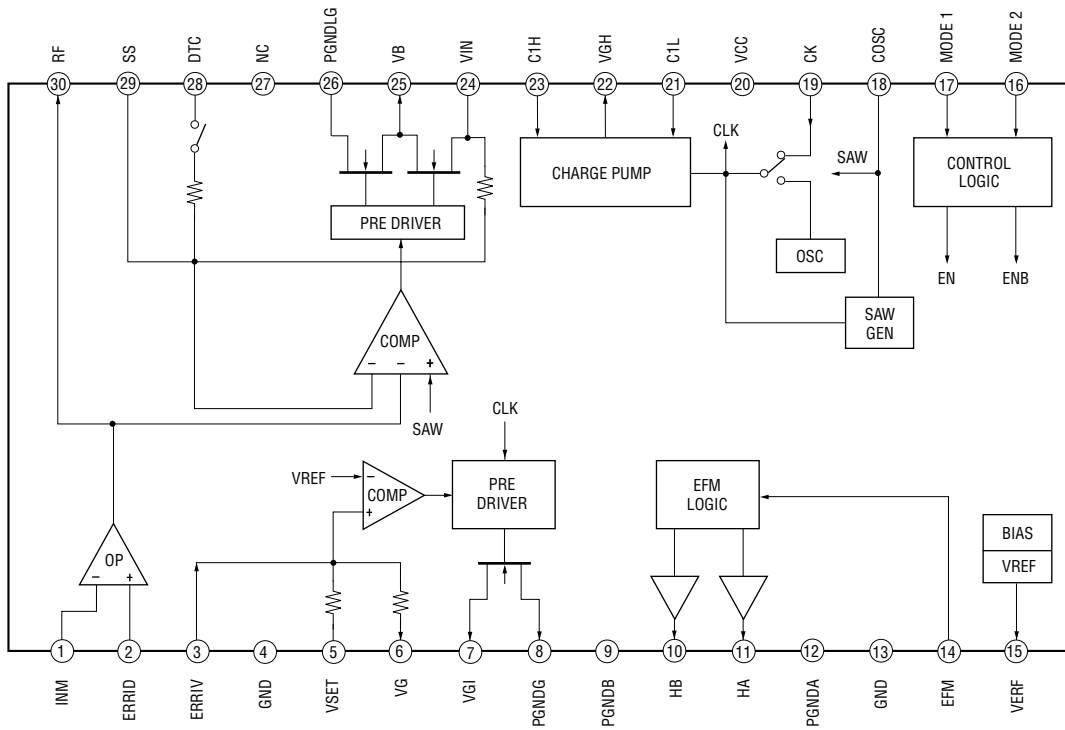
**IC601 MPC17A56FTA**



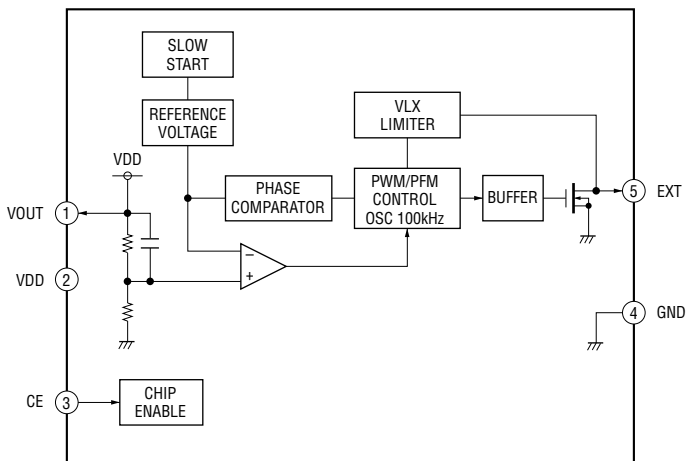
**IC602 MPC17A17XDTBR2**



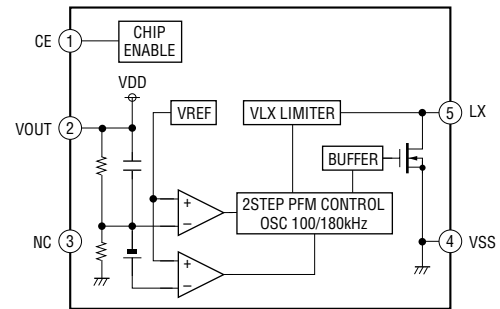
**IC603 MPC18A20MTAEL**



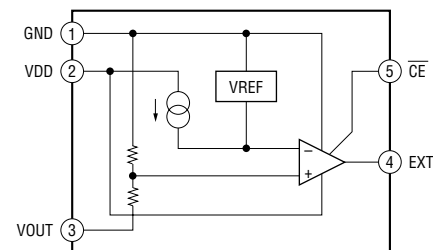
**IC605 XC6367B103MR**



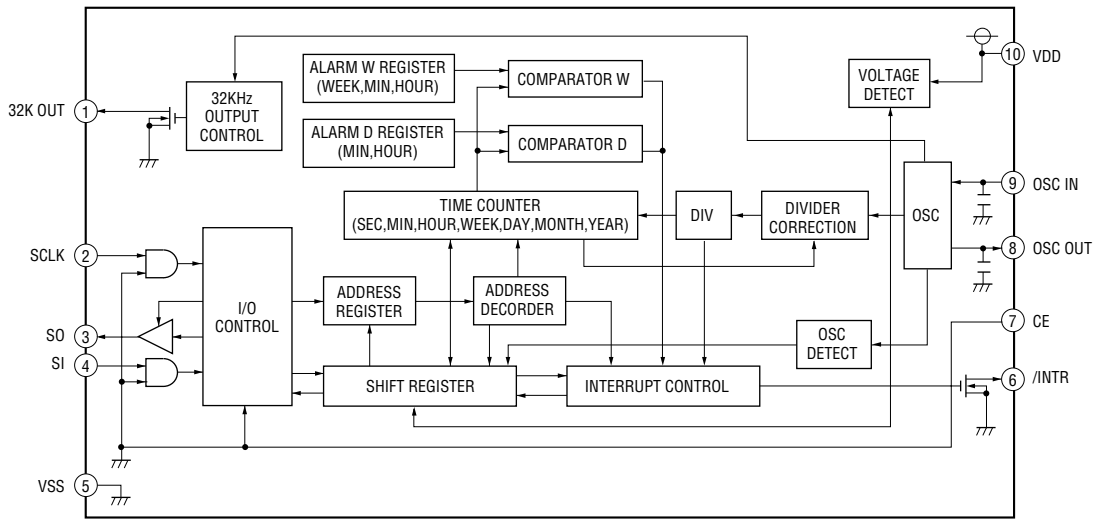
**IC803 XC6383C301MR**



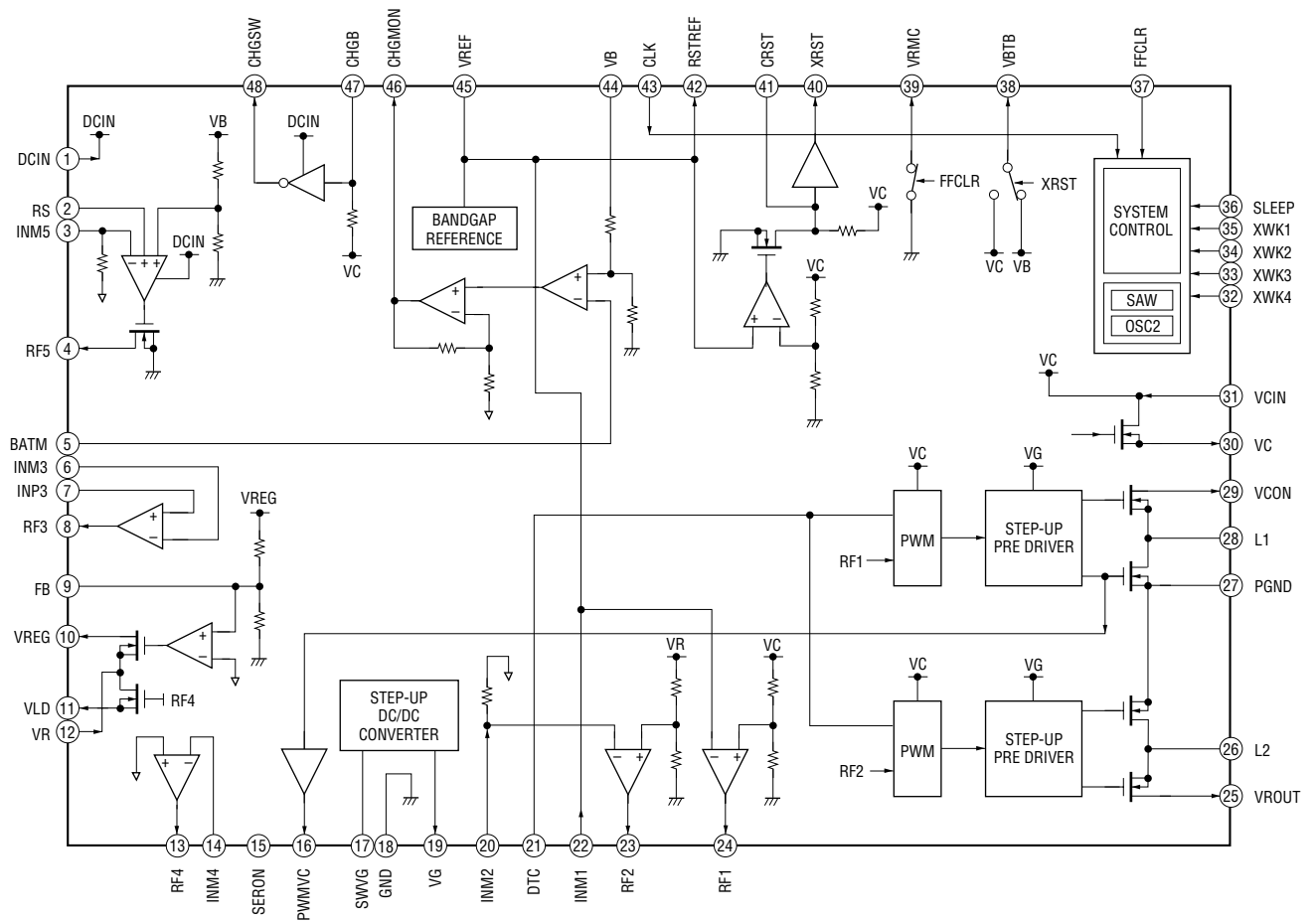
**IC902 RN5RG25AA-TR**



**IC804 RV5C348A-E2**



**IC901 MPC18A31FTA**



## 6-6. IC PIN FUNCTION DESCRIPTION

### • MAIN BOARD IC501 SN761056ADBT (RF AMP, FOCUS/TRACKING ERROR AMP)

Pin No.	Pin Name	I/O	Description
1	TE	O	Tracking error signal output to the CXD2660GA (IC502)
2	REXT	—	Connected to the external resistor for the ADIP amplifier control
3	WPPLPF	—	Connected to the external capacitor for low-pass filter of the TPP/WPP
4	VREF11	O	Reference voltage output terminal (+1.1V)
5	C	I	Signal input from the optical pick-up detector (C)
6	D	I	Signal input from the optical pick-up detector (D)
7	D-C	I	Signal input from the optical pick-up detector (D) (AC input)
8	IY	I	I-V converted RF signal IY input from the optical pick-up block detector
9	IX	I	I-V converted RF signal IX input from the optical pick-up block detector
10	JX	I	I-V converted RF signal JX input from the optical pick-up block detector
11	JY	I	I-V converted RF signal JY input from the optical pick-up block detector
12	A	I	Signal input from the optical pick-up detector (A)
13	A-C	I	Signal input from the optical pick-up detector (A) (AC input)
14	B	I	Signal input from the optical pick-up detector (B)
15	TON-C	—	Connected to the external capacitor for the TON hold
16	CIG	—	Connected to the external capacitor for low-pass filter of the NPP divider denominator
17	CDN	—	Connected to the external capacitor for low-pass filter of the CSL divider denominator
18	PD-NI	I	Light amount monitor input terminal (non-invert input)
19	PD-I	I	Light amount monitor input terminal (invert input)
20	PD-O	O	Light amount monitor output terminal
21	ADFG	O	ADIP duplex FM signal (22.05 kHz $\pm$ 1 kHz) output to the CXD2660GA (IC502)
22	DVDD	—	Power supply terminal (+2.4V) (digital system)
23	SBUS	I/O	Two-way SSB serial data bus with the system controller (IC801)
24	SCK	I	SSB serial clock signal input from the system controller (IC801)
25	$\overline{\text{XRST}}$	I	Reset signal input from the system controller (IC801) "L": reset
26	OFTRK	I	Off track signal input from the CXD2660GA (IC502)
27	DGND	—	Ground terminal (digital system)
28	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2660GA (IC502)
29	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2660GA (IC502)
30	VREF075	—	Connected to the external capacitor for the internal reference voltage
31	VC	O	Middle point voltage (+1.2V) generation output terminal
32	CCSL2	—	Connected to the external capacitor for low-pass filter of the TPP/WPP
33	RF OUT	O	Playback EFM RF signal output to the CXD2660GA (IC502)
34	AGND	—	Ground terminal (analog system)
35	EQ	—	Connected to the external capacitor for the RF equalizer
36	LP	—	Connected to the external capacitor for the RF equalizer
37	PS	—	Connected to the external capacitor for the RF equalizer
38	OFC-2	—	Connected to the external capacitor for the RF AC coupling
39	OFC-1	—	Connected to the external capacitor for the RF AC coupling
40	AVCC	—	Power supply terminal (+2.4V) (analog system)
41	ABCD	O	Light amount signal (ABCD) output to the CXD2660GA (IC502)
42	FE	O	Focus error signal output to the CXD2660GA (IC502)
43	S-MON	O	Servo signal monitor output to the system controller (IC801)
44	ADIP-IN	I	ADIP duplex FM signal (22.05 kHz $\pm$ 1 kHz) input terminal Not used

• MAIN BOARD IC502 CXD2660GA

(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER, SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER, 16M BIT D-RAM)

Pin No.	Pin Name	I/O	Description
1	VDC0	—	Power supply terminal (+1.8V) (for internal logic)
2	MNT0	I/O	Not used (open)
3	MNT1	O	Recording shock detect signal output to the system controller (IC801)
4	MNT2	O	Off track signal output to the SN761056ADBT (IC501) and system controller (IC801)
5	MNT3	O	Focus OK signal output to the system controller (IC801) “H”: is output when focus is on (“L”: NG)
6	SWDT	I	Serial data input from the system controller (IC801)
7	SCLK	I (S)	Serial clock signal input from the system controller (IC801)
8	XLAT	I (S)	Serial data latch pulse input from the system controller (IC801)
9	VSC0	—	Ground terminal (for internal logic)
10	SRDT	O (3)	Serial data output to the system controller (IC801)
11	SENS	O (3)	Internal status (SENSE) output to the system controller (IC801)
12	$\overline{\text{XRST}}$	I (S)	Reset signal input from the system controller (IC801) “L”: reset
13	SQSY	O	Subcode Q sync (SCOR) output the system controller (IC801) “L” is output every 13.3 msec Almost all, “H” is output
14	DQSY (MTFLGL)	O	Digital In U-bit CD format subcode Q sync (SCOR) output to the system controller (IC801) “L” is output every 13.3 msec Almost all, “H” is output
15	RECP	I	Laser power selection signal input from the system controller (IC801) “L”: playback mode, “H”: recording mode
16	XINT	O	Interrupt status output to the system controller (IC801)
17	TX	I	Recording data output enable signal input from the system controller (IC801) Writing data transmission timing input
18	VDIO0	—	Power supply terminal (+2.4V) (for I/O)
19	OSCI	I	System clock (512Fs=22.5792 MHz) input terminal
20	OSCO	O	System clock (512Fs=22.5792 MHz) output terminal
21	VSIO0	—	Ground terminal (for I/O)
22 to 29	NC	—	Not used (open)
30	VSC1	—	Ground terminal (for internal logic)
31	XTSL	I	Input terminal for the system clock frequency setting “L”: 45.1584 MHz, “H”: 22.5792 MHz (fixed at “H” in this set)
32	XCS_DSP	I	Chip select signal input from the system controller (IC801)
33	DIN1	I	Digital audio signal input terminal when recording mode
34	DOUT	O	Digital audio signal output terminal when playback mode Not used (open)
35	DT72	O	Not used (open)
36, 37	VDC1, VDC2	—	Power supply terminal (+1.8V) (for internal logic)
38	DATAI	I	Serial data input terminal Not used (fixed at “L”)
39	LRCKI	I	L/R sampling clock signal (44.1 kHz) input terminal “L”: Rch, “H”: Lch Not used (fixed at “L”)
40	XBCKI	I	Serial input/output data bit clock signal (2.8224 MHz) input terminal Not used (fixed at “L”)
41	ADDT	I	Recording data signal input from the A/D, D/A converter (IC301)
42	DADT	O	Playback data signal output to the A/D, D/A converter (IC301)
43	LRCK	O	L/R sampling clock signal (44.1 kHz) output to the A/D, D/A converter (IC301)
44	VSC2	—	Ground terminal (for internal logic)
45	XBCK	O	Serial input/output data bit clock signal (2.8224 MHz) out put to the A/D, D/A converter (IC301)

\* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O



Pin No.	Pin Name	I/O	Description
46	FS256	O	Clock signal (11.2896 MHz) output to the A/D, D/A converter (IC301) (X' tal system)
47 to 52	A03, A04, A02, A05, A01, A06	O	Address signal output to the external D-RAM Not used (open)
53	VDIO1	—	Power supply terminal (+2.4V) (for I/O)
54	VSIO1	—	Ground terminal (for I/O)
55 to 59	A00, A07, A10, A08, A09	O	Address signal output to the external D-RAM Not used (open)
60	$\overline{\text{X}}\text{RAS}$	O	Row address strobe signal output to the external D-RAM "L" active Not used (open)
61	$\overline{\text{X}}\text{OE}$	O	Output enable signal output terminal for internal D-RAM "L" active Not used (open)
62	$\overline{\text{X}}\text{WE}$	O	Data write enable signal output terminal for internal D-RAM "L" active Not used (open)
63	$\overline{\text{X}}\text{CAS}$	O	Column address strobe signal output to the external D-RAM "L" active Not used (open)
64 to 67	D1, D2, D0, D3	I/O	Two-way data bus with the external D-RAM Not used (open)
68	VDC3	—	Power supply terminal (+1.8V) (for internal logic)
69	VSC3	—	Ground terminal (for internal logic)
70	A11	O	Address signal output to the external D-RAM Not used (open)
71	$\overline{\text{X}}\text{OE}$	O	Output enable signal output to the external D-RAM "L" active Not used (open)
72	$\overline{\text{X}}\text{WE}$	O	Data write enable signal output to the external D-RAM "L" active Not used (open)
73	MVCI	I (S)	Digital in PLL oscillation input from the external VCO Not used (fixed at "L")
74	ASYO	O (A)	Playback EFM full-swing output terminal
75	ASYI	I (A)	Playback EFM asymmetry comparator voltage input terminal
76	AVD1	—	Power supply terminal (+2.4V) (analog system)
77	BIAS	I (A)	Playback EFM asymmetry circuit constant current input terminal
78	RFI	I (A)	Playback EFM RF signal input from the SN761056ADBT (IC501)
79	AVS1	—	Ground terminal (analog system)
80	PCO	O (3)	Phase comparison output for master clock of the recording/playback EFM master PLL
81	FILI	I (A)	Filter input for master clock of the recording/playback EFM master PLL
82	FILO	O (A)	Filter output for master clock of the recording/playback EFM master PLL
83	CLTV	I (A)	Internal VCO control voltage input of the recording/playback EFM master PLL
84	PEAK	I (A)	Light amount signal (RF/ABCD) peak hold input from the SN761056ADBT (IC501)
85	BOTM	I (A)	Light amount signal (RF/ABCD) bottom hold input from the SN761056ADBT (IC501)
86	ABCD	I (A)	Light amount signal (ABCD) input from the SN761056ADBT (IC501)
87	FE	I (A)	Focus error signal input from the SN761056ADBT (IC501)
88	AUX1	I (A)	Auxiliary signal (I <sub>3</sub> signal/temperature signal) input terminal Not used (fixed at "H")
89	VC	I (A)	Middle point voltage (+1.2V) input terminal
90	ADIO	O (A)	Monitor output of the A/D converter input signal Not used (open)
91	ADRT	I (A)	A/D converter operational range upper limit voltage input terminal (fixed at "H" in this set)
92	AVD2	—	Power supply terminal (+2.4V) (analog system)
93	AVS2	—	Ground terminal (analog system)
94	ADRB	I (A)	A/D converter operational range lower limit voltage input terminal (fixed at "L" in this set)
95	SE	I (A)	Sled error signal input terminal Not used (fixed at "L")
96	TE	I (A)	Tracking error signal input from the SN761056ADBT (IC501)
97	DCHG	I (A)	Connected to the +2.4V power supply
98	APC	I (A)	Error signal input for the laser automatic power control Not used (fixed at "H")
99	ADFG	I (A)	ADIP duplex FM signal (22.05 kHz $\pm$ 1 kHz) input from the SN761056ADBT (IC501)
100	VDIO2	—	Power supply terminal (+2.4V) (for I/O)
101	VSIO2	—	Ground terminal (for I/O)
102	F0CNT	O	Filter f <sub>0</sub> control signal output terminal Not used (open)

\* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O



Pin No.	Pin Name	I/O	Description
103	XLRF	O	Serial latch signal output terminal Not used (open)
104	CKRF	O	Serial clock signal output terminal Not used (open)
105	DTRF	O	Writing data output terminal Not used (open)
106	APCREF	O	Control signal output to the reference voltage generator circuit for the laser automatic power control
107	LDDR	O	PWM signal output for the laser automatic power control Not used (open)
108	VDC4	—	Power supply terminal (+1.8V) (for internal logic)
109	TRDR	O	Tracking servo drive PWM signal (–) output to the MPC17A56FTA (IC601)
110	TFDR	O	Tracking servo drive PWM signal (+) output to the MPC17A56FTA (IC601)
111	FFDR	O	Focus servo drive PWM signal (+) output to the MPC17A56FTA (IC601)
112	FRDR	O	Focus servo drive PWM signal (–) output to the MPC17A56FTA (IC601)
113	FS4	O	Clock signal (176.4 kHz) output to the MPC18A20MTAEL (IC603) (X' tal system)
114	SRDR	O	Sled servo drive PWM signal (–) output terminal Not used (open)
115	SFDR	O	Sled servo drive PWM signal (+) output terminal Not used (open)
116	VSC4	—	Ground terminal (for internal logic)
117	SPRD	O	Spindle servo drive PWM signal (–) output terminal Not used (open)
118	SPFD	O	Spindle servo drive PWM signal (+) output terminal Not used (open)
119	FGIN	I	FG signal input terminal for spindle servo Not used (open)
120 to 122	TEST1 to TEST3	I	Input terminal for the test (normally : fixed at “L”)
123	EFMO	O	EFM signal output when recording mode to the MPC18A20MTAEL (IC603)
124	SPVS	O	Spindle servo drive voltage control signal output to the MPC17A56FTA (IC601)
125	VDIO3	—	Power supply terminal (+2.4V) (for I/O)
126	VSIO3	—	Ground terminal (for I/O)
127	SPDU	O	Spindle servo (U) drive signal output to the MPC17A56FTA (IC601)
128	SPDV	O	Spindle servo (V) drive signal output to the MPC17A56FTA (IC601)
129	SPDW	O	Spindle servo (W) drive signal output to the MPC17A56FTA (IC601)
130	SPCU	I	Spindle servo (U) timing signal input from the MPC17A56FTA (IC601)
131	SPCV	I	Spindle servo (V) timing signal input from the MPC17A56FTA (IC601)
132	SPCW	I	Spindle servo (W) timing signal input from the MPC17A56FTA (IC601)
133	SLDU	O	Sled servo (1+) drive signal output to the MPC17A56FTA (IC601)
134	SLDV	O	Sled servo (1–) drive signal output to the MPC17A56FTA (IC601)
135	SLDW	O	Sled servo (2+) drive signal output to the MPC17A56FTA (IC601)
136	VDC5	—	Power supply terminal (+1.8V) (for internal logic)
137	VSC5	—	Ground terminal (for internal logic)
138	SLCU	I	Sled servo (1) timing signal input from the MPC17A56FTA (IC601)
139	SLCV	I	Sled servo (2) timing signal input from the MPC17A56FTA (IC601)
140	SLCW	O	Sled servo (2–) timing signal output to the MPC17A56FTA (IC601)
141	SLVS	O	Sled servo voltage control signal output to the MPC17A56FTA (IC601)
142	BYPS	O	By-pass transistor control signal output to the MPC17A56FTA (IC601)
143	VSS	—	Ground terminal (for internal 16M bit D-RAM)
144	VDD	—	Power supply terminal (+2.4V) (for internal 16M bit D-RAM)
145	VSS	—	Ground terminal (for internal 16M bit D-RAM)
146	VDD	—	Power supply terminal (+2.4V) (for internal 16M bit D-RAM)
147	IVC	O	Output terminal for the test Not used (open)

• MAIN BOARD IC801 CXR701080-013GA (MASTER CONTROLLER)

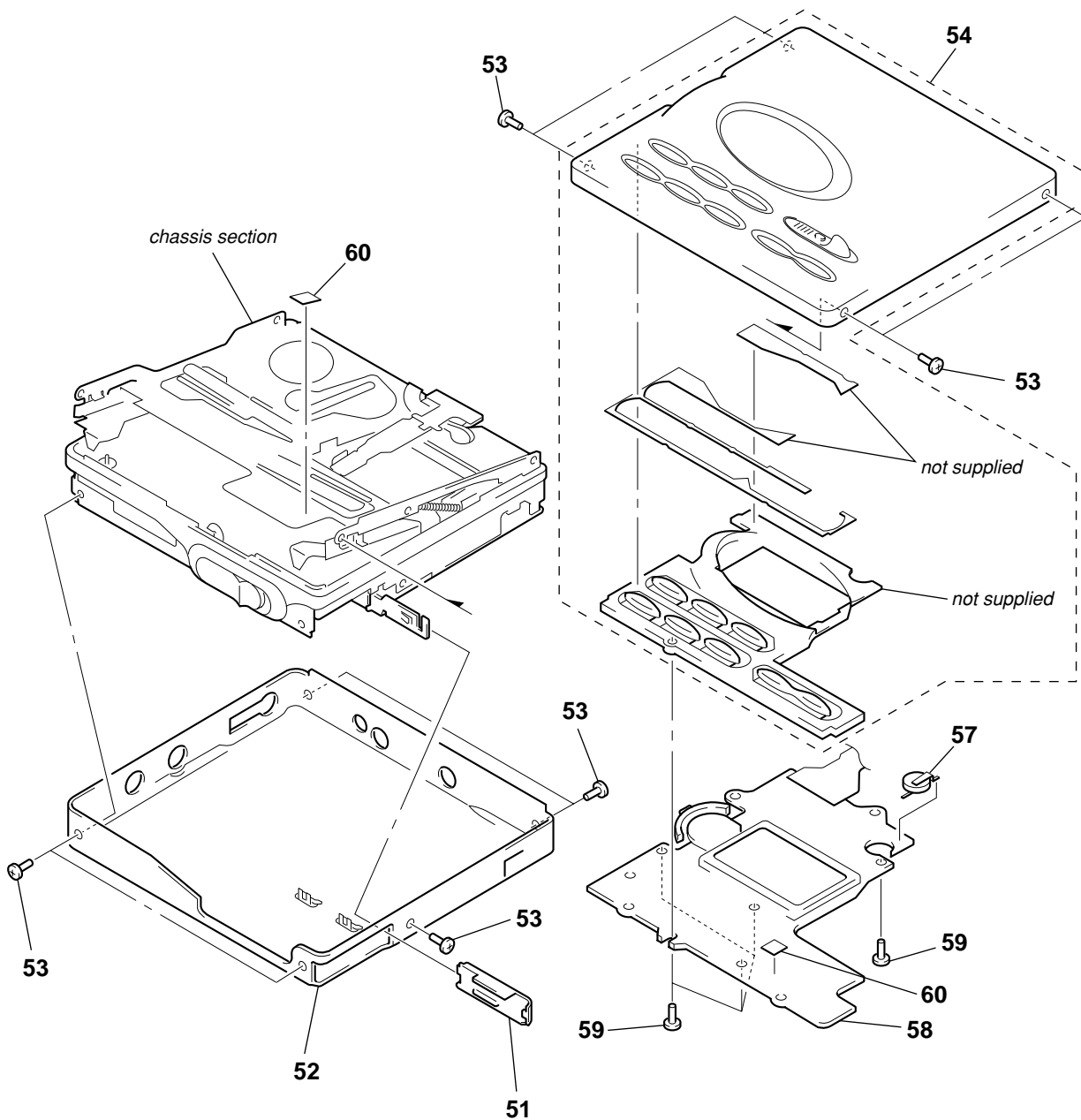
Pin No.	Pin Name	I/O	Description
1	SYNC REC	I	SYNCHRO REC switch (S801) input terminal "L": off, "H": on
2	OFTRK	I	Off track signal input from the CXD2660GA (IC502)
3	PROTECT	I	Rec-proof claw detect input from the protect detect switch (S806) "L": recording possible, "H": protect
4	PAUSE KEY	I	Set pause key input terminal
5	TX	O	Recording data output enable signal output to the CXD2660GA (IC502) Writing data transmission timing output
6	SENSE	I	Internal status (SENSE) input from the CXD2660GA (IC502)
7	WRPWR	O	Laser power select signal output to the CXD2660GA (IC502) "L": playback mode, "H": recording mode
8	XLAT	O	Serial data latch pulse output to the CXD2660GA (IC502)
9	XCS DSP	O	Chip select signal output to the CXD2660GA (IC502)
10	CS RTC	O	Chip select signal output to the real time clock (IC804)
11	SI0	I	Serial data input from the A/D, D/A converter (IC301), CXD2660GA (IC502), EEPROM (IC802), real time clock (IC804) and switch & liquid crystal display module unit
12	SO0	O	Serial data output to the A/D, D/A converter (IC301), CXD2660GA (IC502), EEPROM (IC802), real time clock (IC804) and switch & liquid crystal display module unit
13	SCK0	O	Serial clock signal output to the A/D, D/A converter (IC301), CXD2660GA (IC502), EEPROM (IC802), real time clock (IC804) and switch & liquid crystal display module unit
14	XGUM ON	I	Rechargeable battery pack detection switch (S901) input terminal "L": rechargeable battery pack in
15	VSS	—	Ground terminal
16	VDD	—	Power supply terminal (+2.4V)
17	XOUT	O	Not used (open)
18	BEEP	O	Beep sound control signal input terminal
19	RMC DTCK	I/O	TSB serial communication data input/output terminal for remote commander with headphone
20	XCS LCD	O	Chip select signal output to the liquid crystal display
21	LCD STB	O	Strobe signal output to the liquid crystal display
22	LCD RST	O	Reset control signal output to the liquid crystal display
23	XHP STBY	O	Standby on/off control signal output to the line/headphone amplifier (IC303) "L": standby mode, "H": amplifier on
24	CLV U	O	Spindle servo (U) drive signal output to the MPC17A56FTA (IC601)
25	CLV V	O	Spindle servo (V) drive signal output to the MPC17A56FTA (IC601)
26	CLV W	O	Spindle servo (W) drive signal output to the MPC17A56FTA (IC601)
27	MODE1	O	Power supply control signal output for over write head drive to the MPC18A20MTAEL (IC603)
28	MODE2	O	Power supply control signal output for over write head drive to the MPC18A20MTAEL (IC603)
29	MODE3	O	Power supply control signal output terminal for over write head drive
30	HD CON 1	O	Over write head control signal output to the MPC17A17DTB (IC602)
31	HD CON 2	O	Over write head control signal output to the MPC17A17DTB (IC602)
32	XREC MODE	O	Not used (open)
33	LD ON	O	Laser diode on/off control signal output terminal "L": laser off, "H": laser on Not used (open)
34	TSB SLV ON	I	TSB slave detect signal input terminal
35	SLD MON 1	I	Sled servo timing signal input from the MPC17A56FTA (IC601)
36	PD S0	O	PD IC mode switching signal output to the optical pick-up block
37	REG CTL CLK	O	Synchronizing external clock signal output terminal Not used (open)
38	PD S1	O	PD IC mode switching signal output to the optical pick-up block

Pin No.	Pin Name	I/O	Description
39	FFCLR	O	Input latch output for starting signal to the MPC18A31FTA (IC901)
40	SLEEP	O	System sleep control signal output to the MPC18A31FTA (IC901) "H": sleep on
41	TSB EDGE	I	TSB slave edge detect signal input terminal
42	GND SW	O	Ground line switching signal output terminal
43	$\overline{\text{XRST}}$	I	System reset signal input from the MPC18A31FTA (IC901) "L": reset For several hundreds msec. after the power supply rises, "L" is input, then it changes to "H"
44	VSS	—	Ground terminal
45	XTAL	O	Main system clock output terminal (16.9344 MHz)
46	EXTAL	I	Main system clock input terminal (16.9344 MHz)
47	VDD	—	Power supply terminal (+2.4V)
48	TSB SLV CTL	I/O	Two-way control signal bus with TSB slave circuit
49	SPDL START SW	O	Spindle servo start switching signal output to the analog switch (IC504, 505)
50	OPEN CLOSE SW	I	Upper panel open/close detect switch (S801) input terminal (A/D input) "L": upper panel close, "H": upper panel open
51	XSHOCK	I	Recording shock detect signal input from the CXD2660GA (IC502)
52	FOK	I	Focus OK signal input from the CXD2660GA (IC502) "H": is input when focus is on ("L": NG)
53	SQSY	I	Subcode Q sync (SCOR) input from the CXD2660GA (IC502) "L" is input every 13.3 msec Almost all, "H" is input
54	DQSY	I	Digital In U-bit CD format subcode Q sync (SCOR) input from the CXD2660GA (IC502) "L" is input every 13.3 msec Almost all, "H" is input
55	XINT	I	Interrupt status input from the CXD2660GA (IC502)
56	T.MARK	I	T MARK switch (S803) input terminal
57	REC WBL SW	O	Stable control signal is output when recording
58	SERON	O	Series power supply control signal output to the MPC18A31FTA (IC901)
59	XCHG	O	Charge control signal output to the MPC18A31FTA (IC901)
60	XTEST	I	Setting terminal for the test mode "L": test mode, normally: fixed at "H"
61	SET CODE0	I	Destination setting terminal Fixed at "L" in this set
62	SET CODE1	I	Destination setting terminal Fixed at "L" in this set (US, canadian model: Not used (open))
63	SET CODE2	I	Destination setting terminal Fixed at "L" in this set (US, canadian model: Not used (open))
64	REG CTL PWM	O	Synchronizing external clock signal output to the MPC18A31FTA (IC901)
65	VRM PWM	O	VREM power supply voltage control PWM signal output to the MPC18A31FTA (IC901)
66	VC PWM	O	System power supply voltage control PWM signal output to the MPC18A31FTA (IC901)
67	SPDL PWM	O	Spindle servo drive voltage control PWM signal output to the MPC17A56FTA (IC601)
68	$\overline{\text{XIC RST}}$	O	Reset signal output to the A/D, D/A converter (IC301), SN761056ADBT (IC501) and CXD2660GA (IC502) "L": reset
69	REC LED	O	REC LED drive signal output terminal "H": LED on
70	SII	I	Joint text data input from the remote commander with headphone
71	SOI	O	Joint text data output to the remote commander with headphone
72	SCK1	O	Joint data communication clock output to the remote commander with headphone
73	XHOLD SW	I	HOLD switch (S804) input terminal "L": hold on, "H": hold off
74	VDD	—	Power supply terminal (+2.4V)
75	TEX	I	Sub system clock input terminal Not used (open)
76	TX	O	Sub system clock output terminal Not used (open)
77	VSS	—	Ground terminal
78	VBKAN	I	Sub power supply input terminal
79	S MON	I	Servo signal monitor input from the SN761056ADBT (IC501) (A/D input)

Pin No.	Pin Name	I/O	Description
80	VB MON	I	Un-regulator power supply voltage monitor input terminal (A/D input)
81	CHG MON	I	Rechargeable battery voltage monitor input from the MPC18A31FTA (IC901) (A/D input)
82	VREF MON	I	Reference voltage monitor input from the SN761056ADBT (IC501) (A/D input)
83	WK DET	I	Set key starting detect signal input terminal (A/D input)
84	HALF LOCK SW	I	Open knob detect switch (S802) input terminal “L”: normal position, “H”: open knob slid
85	RMC KEY	I	Remote commander with headphone key input terminal (A/D input)
86	SET KEY 1	I	Set key input terminal (A/D input) (■, ►►, ◀◀, VOL +/- keys input)
87	SET KEY 2	I	Set key input terminal (A/D input) (►, jog, END SEARCH keys input)
88	REC KEY	I	REC key input terminal
89	VRM MON	I	VREM voltage monitor input terminal (A/D input)
90	HIDC MON	I	HI-DC voltage monitor input terminal (A/D input)
91	AD GND	—	Ground terminal (for A/D converter)
92	AVREF	I	Input terminal for power supply voltage adjustment reference voltage (+2.4V) (for A/D converter)
93	AVDD	—	Power supply terminal (+2.4V) (for A/D converter)
94	TEST0	I	Input terminal for the test (normally: fixed at “L”)
95	TEST1	I	Input terminal for the test (normally: fixed at “L”)
96	TDI	I	Input terminal for JTAG Not used (open)
97	TMS	I	Input terminal for JTAG Not used (open)
98	TCK	I	Input terminal for JTAG Not used (open)
99	TRST	I	Input terminal for JTAG Not used (open)
100	TDO	O	Output terminal for JTAG Not used (open)
101	TSB CLKCTL	O	TSB clock control signal output terminal
102	SSB DATA	I/O	Two-way SSB serial data bus with the SN761056ADBT (IC501)
103	SSB CLK	O	SSB serial clock signal output to the SN761056ADBT (IC501)
104	FLASH WR EN	—	Not used (fixed at “H”)
105	VDD	—	Power supply terminal (+2.4V)
106	VSS	—	Ground terminal
107 to 109	VLC1 to VLC3	—	Power supply terminal for the liquid crystal display (+2.4V)
110	XCS ADA	O	Chip select signal output to the A/D, D/A converter (IC301)
111	XPD ADA	O	Power supply control signal output to the A/D, D/A converter (IC301)
112	$\overline{\text{XRST MTR DRV}}$	O	Reset signal output terminal “L”: reset Not used (open)
113	OPT DET	I	DIN plug detect signal input terminal
114	XJACK DET	I	LINE IN plug detect signal input terminal
115	XMIC DET	I	MIC plug detect signal input terminal
116	XOPT CONT	O	Power supply control signal output to the DIN plug laser diode
117	MUTE	O	Analog muting on/off control signal output terminal “L”: muting off, “H”: muting on
118	XHP STBY TMP	O	Power supply control signal output to the headphone amplifier Not used (open)
119	XCS NV	O	Chip select signal output to the EEPROM (IC802)
120	XINT REC SW	O	Not used (open)

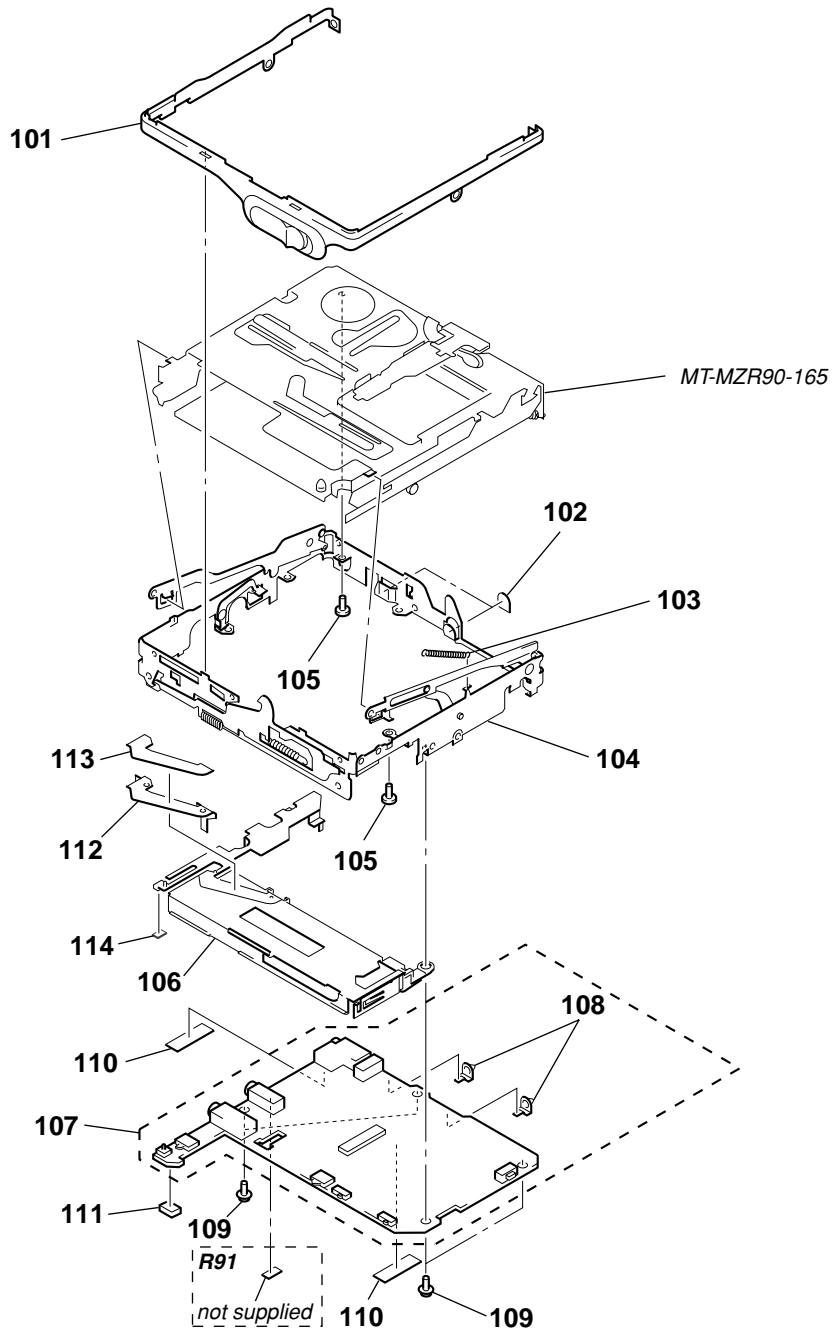


(2) PANEL SECTION (MZ-R91)



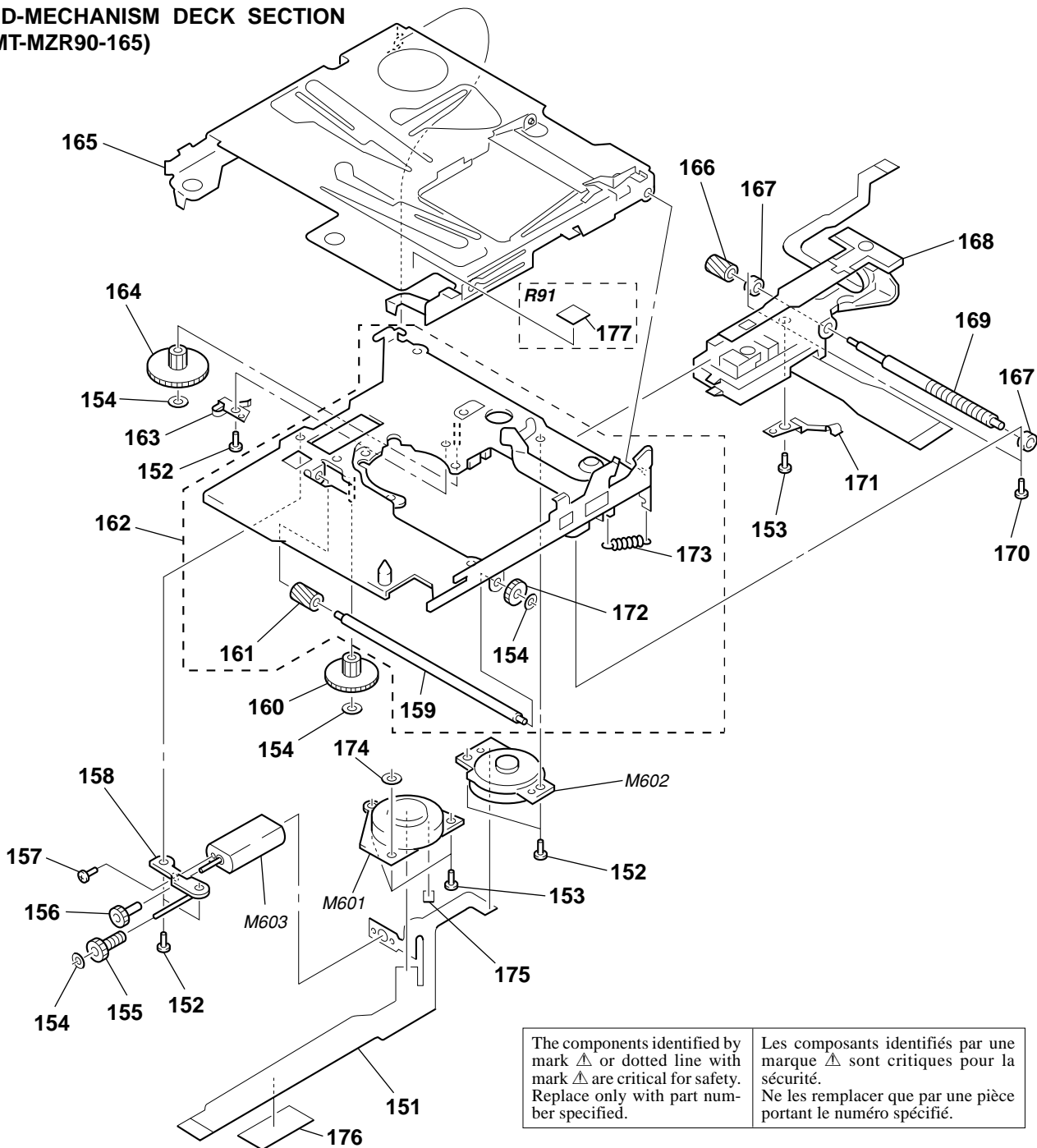
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-223-077-21	LID, BATTERY CASE (BLUE)		54	X-3378-553-1	SERVICE ASSY, UPPER PANEL (L) (BLUE)	
51	4-223-077-31	LID, BATTERY CASE (RED)		54	X-3378-554-1	SERVICE ASSY, UPPER PANEL (R) (RED)	
51	4-223-077-41	LID, BATTERY CASE (WHITE)		54	X-3378-555-1	SERVICE ASSY, UPPER PANEL (W) (WHITE)	
52	X-4952-184-1	PANEL (L) ASSY, BOTTOM (BLUE)		57	1-756-028-11	BATTERY	
52	X-4952-186-1	PANEL (R) ASSY, BOTTOM (RED)		58	1-803-759-11	LCD MODULE	
52	X-4952-188-1	PANEL (W) ASSY, BOTTOM (WHITE)		59	4-984-017-01	SCREW (1.7), TAPPING	
53	4-218-229-09	SCREW (1.4), MI		60	3-044-057-01	SHEET (BATTERY CASE)	

**(3) CHASSIS SECTION**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	X-4952-044-1	BELT ASSY (S), ORNAMENTAL (SILVER)	(R90/R91)	107	A-3323-493-A	MAIN BOARD, COMPLETE (R90: US, CND)	
101	X-4952-337-1	BELT (B) ASSY, ORNAMENTAL (BLACK)	(R90: BLACK)	108	4-223-110-01	TERMINAL (3)	
102	4-223-076-01	SHEET (TERMINAL), INSULATING		109	3-335-797-91	SCREW (M1.4), TOOTHED LOCK	
103	4-223-083-01	SPRING (ARM), TENSION		110	3-042-741-01	SHEET (FLEXIBLE) (R90/R91: HK, JEW)	
104	X-4952-042-1	CHASSIS ASSY, SET		111	3-044-312-01	SHEET (PC BOARD) (2)	
105	4-218-233-05	SCREW (1.4), MI		112	3-043-283-01	JOINT (R90: US, E, AUS, CH/ R91: EXCEPT HK, JEW)	
106	X-4952-043-1	CASE ASSY, BATTERY		112	3-043-283-02	JOINT (R90: EXCEPT US, E, AUS CH/ R91: HK, JEW)	
107	A-3323-361-A	MAIN BOARD, COMPLETE	(R90: AEP, UK, E, AUS, CH/R91: AEP, UK)	113	3-043-530-01	SHEET (JOINT), INSULATING	(R90: EXCEPT CA/R91)
107	A-3323-374-A	MAIN BOARD, COMPLETE (R90: FR/R91: FR)		114	3-049-215-01	SHEET (PRO)	
107	A-3323-491-A	MAIN BOARD, COMPLETE	(R90: HK, JEW/R91: HK, JEW)				

**(4) MD-MECHANISM DECK SECTION  
(MT-MZR90-165)**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	1-675-466-11	MOTOR FLEXIBLE BOARD		166	4-222-208-01	GEAR (SB)	
152	4-963-883-42	SCREW (M1.4), PRECISION PAN		167	4-222-204-01	BEARING	
153	4-963-883-31	SCREW (M1.4), PRECISION PAN		△168	X-4952-386-1	SERVICE ASSY, OP	
154	3-338-645-31	WASHER (0.8-2.5)		169	4-222-203-01	SCREW, LEAD	
155	4-222-214-11	GEAR (HB)		170	3-349-825-21	SCREW	
156	4-222-217-01	GEAR (HA)		171	4-222-205-01	SPRING, RACK	
157	4-224-885-01	SCREW (M1.2X1.5)		172	4-222-222-01	GEAR (RACK)	
158	X-4951-918-1	CHASSIS ASSY, GEAR		173	4-222-226-01	SPRING (EJECT), TENSION	
159	4-222-223-01	SHAFT, SUB		174	4-997-677-11	WASHER	
160	4-222-215-01	GEAR (HC)		175	3-043-428-01	SHEET (CLV)	
161	4-222-218-01	GEAR (HD)		176	3-222-363-01	SPACER (FLEXIBLE)	
162	X-4951-920-1	CHASSIS ASSY		M601	8-835-666-01	MOTOR, DC SSM-01C14A (SPINDLE) (WITH TURN TABLE)	
163	4-222-206-01	SPRING, THRUST		M602	1-763-399-11	MOTOR, DC (SLED) (WITH GEAR)	
164	4-222-216-01	GEAR (SA)		M603	1-763-400-11	MOTOR, DC (OVER WRITE HEAD UP/DOWN)	
165	X-4951-919-1	HOLDER ASSY					



# 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 and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS  
All resistors are in ohms.  
METAL: Metal-film resistor.  
METAL OXIDE: Metal oxide-film resistor.  
F: nonflammable
- Abbreviation  
AUS : Australian model      FR : French model  
CH : Chinese model      HK : Hong Kong model  
CND : Canadian model      JEW : Tourist model

- Items marked “\*” are not stocked since they are seldom required for routine service.  
Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA. . :  $\mu$ A. .      uPA. . :  $\mu$ PA. .  
uPB. . :  $\mu$ PB. .      uPC. . :  $\mu$ PC. .  
uPD. . :  $\mu$ PD. .
- CAPACITORS  
uF:  $\mu$ F
- COILS  
uH:  $\mu$ H

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.

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-3323-361-A	MAIN BOARD, COMPLETE (R90: AEP, UK, E, AUS, CH/R91: AEP, UK)		C210	1-135-337-11	TANTALUM CHIP 1uF 20%	6.3V
	A-3323-374-A	MAIN BOARD, COMPLETE (R90: FR/R91: FR)		C211	1-164-874-11	CERAMIC CHIP 100PF 5%	16V
	A-3323-491-A	MAIN BOARD, COMPLETE (R90: HK, JEW/R91: HK, JEW)		C212	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
	A-3323-493-A	MAIN BOARD, COMPLETE (R90: US, CND) *****		C213	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
	4-223-110-01	TERMINAL (3) < CAPACITOR >		C214	1-164-878-11	CERAMIC CHIP 150PF 5%	16V
C101	1-125-984-21	TANTALUM CHIP 22uF	20% 4V	C216	1-164-937-11	CERAMIC CHIP 0.001uF 10%	16V
C102	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C217	1-125-985-91	CERAMIC CHIP 0.47uF 10%	25V
C103	1-131-734-21	TANTALUM CHIP 4.7uF	20% 6.3V	C218	1-164-939-11	CERAMIC CHIP 0.0022uF 10%	16V
C104	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C220	1-164-940-11	CERAMIC CHIP 0.0033uF 10%	16V
C105	1-117-863-11	CERAMIC CHIP 0.47uF	10% 6.3V	C222	1-125-837-11	CERAMIC CHIP 1uF 10%	6.3V
C106	1-131-727-91	TANTALUM CHIP 470uF	20% 2.5V	C301	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C107	1-115-467-11	CERAMIC CHIP 0.22uF	10% 10V (EXCEPT R90: FR/R91: FR)	C302	1-127-895-11	TANTALUM CHIP 22uF 20%	4V
C107	1-165-176-11	CERAMIC CHIP 0.047uF	16V (R90: FR/R91: FR)	C303	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C108	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C304	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
C109	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C305	1-164-943-11	CERAMIC CHIP 0.01uF 10%	16V
C110	1-135-337-11	TANTALUM CHIP 1uF	20% 6.3V	C306	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
C111	1-164-874-11	CERAMIC CHIP 100PF	5% 16V	C307	1-131-862-91	TANTALUM CHIP 47uF 20%	4V
C112	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C308	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C113	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C309	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C114	1-164-878-11	CERAMIC CHIP 150PF	5% 16V	C310	1-164-943-11	CERAMIC CHIP 0.01uF 10%	16V
C116	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V	C311	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C117	1-125-985-91	CERAMIC CHIP 0.47uF	10% 25V	C312	1-164-949-11	CERAMIC CHIP 0.047uF	16V
C118	1-164-939-11	CERAMIC CHIP 0.0022uF	10% 16V	C313	1-164-941-11	CERAMIC CHIP 0.0047uF 10%	16V
C120	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C314	1-164-937-11	CERAMIC CHIP 0.001uF 10%	16V
C122	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C315	1-131-725-91	TANTALUM CHIP 47uF 20%	4V
C201	1-125-984-21	TANTALUM CHIP 22uF	20% 4V	C316	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C202	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C317	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C203	1-131-734-21	TANTALUM CHIP 4.7uF	20% 6.3V	C318	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C204	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C319	1-164-943-11	CERAMIC CHIP 0.01uF 10%	16V
C205	1-117-863-11	CERAMIC CHIP 0.47uF	10% 6.3V	C320	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
C206	1-131-727-91	TANTALUM CHIP 470uF	20% 2.5V	C321	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
C207	1-115-467-11	CERAMIC CHIP 0.22uF	10% 10V (EXCEPT R90: FR/R91: FR)	C322	1-131-862-91	TANTALUM CHIP 47uF 20%	4V
C207	1-165-176-11	CERAMIC CHIP 0.047uF	16V (R90: FR/R91: FR)	C323	1-117-919-11	TANTALUM CHIP 10uF 20%	6.3V
C208	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C324	1-127-895-11	TANTALUM CHIP 22uF 20%	4V
C209	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C327	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V
				C328	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V (R90: US, CND)
				C329	1-164-937-11	CERAMIC CHIP 0.001uF 10%	16V (R90: US, CND)
				C330	1-107-820-11	CERAMIC CHIP 0.1uF	16V
				C331	1-164-943-11	CERAMIC CHIP 0.01uF 10%	16V
				C332	1-127-895-11	TANTALUM CHIP 22uF 20%	4V
				C501	1-125-777-11	CERAMIC CHIP 0.1uF 10%	10V

**MAIN**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C502	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C624	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C503	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C625	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C504	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C626	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C505	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C627	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C506	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C628	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C507	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C629	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C508	1-164-858-11	CERAMIC CHIP 22PF	5% 16V	C630	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C509	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C631	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C510	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C632	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C511	1-164-845-11	CERAMIC CHIP 5PF	0.25PF 16V	C633	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C512	1-164-938-11	CERAMIC CHIP 0.0015uF	10% 16V	C634	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C513	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C635	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C514	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C636	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C515	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C637	1-131-726-91	TANTALUM CHIP 33uF	20% 6.3V
C516	1-164-845-11	CERAMIC CHIP 5PF	0.25PF 16V	C638	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V
C517	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C801	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C519	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C803	1-164-941-11	CERAMIC CHIP 0.0047uF	10% 16V
C520	1-107-819-11	CERAMIC CHIP 0.022uF	10% 16V	C804	1-164-858-11	CERAMIC CHIP 22PF	5% 16V
C521	1-119-923-81	CERAMIC CHIP 0.047uF	10% 10V	C806	1-127-895-11	TANTALUM CHIP 22uF	20% 4V
C522	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C807	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C524	1-131-725-91	TANTALUM CHIP 47uF	20% 4V	C808	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C525	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C809	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V
C526	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C810	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C527	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 16V	C811	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V
C528	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 16V	C899	1-164-217-11	CERAMIC CHIP 150PF	5% 50V (EXCEPT R90: US, CND)
C529	1-127-895-11	TANTALUM CHIP 22uF	20% 4V	C901	1-164-941-11	CERAMIC CHIP 0.0047uF	10% 16V
C530	1-131-725-91	TANTALUM CHIP 47uF	20% 4V	C902	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C531	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C903	1-128-964-91	TANTALUM CHIP 100uF	20% 6.3V
C532	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C904	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C533	1-164-245-11	CERAMIC CHIP 0.015uF	10% 25V	C905	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C534	1-117-863-11	CERAMIC CHIP 0.47uF	10% 6.3V	C906	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C535	1-164-935-11	CERAMIC CHIP 470PF	10% 16V	C907	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C536	1-117-863-11	CERAMIC CHIP 0.47uF	10% 6.3V	C908	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C537	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C910	1-107-819-11	CERAMIC CHIP 0.022uF	10% 16V
C600	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V	C911	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C601	1-131-623-91	TANTALUM CHIP 15uF	20% 4V	C913	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V
C602	1-109-813-11	CAP, CHIP 100PF	5% 100V	C914	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C603	1-135-337-11	TANTALUM CHIP 1uF	20% 6.3V	C915	1-125-840-91	TANTALUM 10uF	20% 6.3V
C604	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V	C916	1-131-725-91	TANTALUM CHIP 47uF	20% 4V
C605	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C917	1-128-964-91	TANTALUM CHIP 100uF	20% 6.3V
C606	1-127-895-11	TANTALUM CHIP 22uF	20% 4V	C918	1-107-819-11	CERAMIC CHIP 0.022uF	10% 16V
C607	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C919	1-109-982-11	CERAMIC CHIP 1uF	10% 10V
C608	1-107-819-11	CERAMIC CHIP 0.022uF	10% 16V	C920	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V
C609	1-119-923-81	CERAMIC CHIP 0.047uF	10% 10V	C921	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C610	1-164-935-11	CERAMIC CHIP 470PF	10% 16V	C922	1-125-777-11	CERAMIC CHIP 0.1uF	10% 10V
C611	1-119-923-81	CERAMIC CHIP 0.047uF	10% 10V	C923	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C612	1-164-940-11	CERAMIC CHIP 0.0033uF	10% 16V	C925	1-164-943-11	CERAMIC CHIP 0.01uF	10% 16V
C613	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C926	1-119-923-81	CERAMIC CHIP 0.047uF	10% 10V
C614	1-117-919-11	TANTALUM CHIP 10uF	20% 6.3V	C927	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C615	1-135-379-91	TANTALUM CHIP 3.3uF	20% 10V	C928	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C617	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C929	1-119-923-81	CERAMIC CHIP 0.047uF	10% 10V
C618	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C930	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C619	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V	C931	1-164-937-11	CERAMIC CHIP 0.001uF	10% 16V
C620	1-131-621-91	TANTALUM CHIP 6.8uF	20% 6.3V	C932	1-109-982-11	CERAMIC CHIP 1uF	10% 10V
C621	1-127-578-91	TANTALUM CHIP 3.3uF	20% 6.3V	C1001	1-125-840-91	TANTALUM 10uF	20% 6.3V
C622	1-131-621-91	TANTALUM CHIP 6.8uF	20% 6.3V	C1002	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V
C623	1-127-578-91	TANTALUM CHIP 3.3uF	20% 6.3V	C1003	1-127-772-81	CERAMIC CHIP 33000PF	10% 10V

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C1004	1-164-939-11	CERAMIC CHIP 0.0022uF 10%	16V	@ IC502	8-752-397-66	IC CXD2660GA	
		< CONNECTOR >		IC504	8-759-647-75	IC TC7W66FK (TE85R)	
* CN501	1-778-168-11	CONNECTOR, FFC/FPC (ZIF) 20P		IC505	8-759-647-75	IC TC7W66FK (TE85R)	
* CN601	1-793-510-21	CONNECTOR, FPC (ZIF) 5P		IC601	8-759-678-83	IC MPC17A56FTAEB	
* CN602	1-793-511-21	CONNECTOR, FPC (ZIF) 15P		IC602	8-759-642-58	IC MPC17A17XDTBR2	
* CN801	1-793-511-21	CONNECTOR, FPC (ZIF) 15P		IC603	8-759-642-59	IC MPC18A20MTAEL	
		< DIODE >		IC604	8-759-358-40	IC TLC372CPWR	
D301	8-719-077-43	DIODE MAZZ068H01S0		IC605	8-759-586-58	IC XC6367B103MR	
D302	8-719-077-43	DIODE MAZZ068H01S0		@ IC801	8-752-914-73	IC CXR701080-013GA	
D303	8-719-056-54	DIODE MAZS068008S0		IC802	8-759-593-47	IC AK6417AM-E2	
D304	8-719-017-58	DIODE MA8068-TX		IC803	8-759-641-93	IC XC6383C301MR	
D501	8-719-421-27	DIODE MA728-TX		IC804	8-759-641-91	IC RV5C348A-E2	
D600	8-719-072-10	DIODE FS05J10-TP		IC901	8-759-678-82	IC MPC18A31FTAEB	
D601	8-719-072-10	DIODE FS05J10-TP		IC902	8-759-652-23	IC RN5RG25AA-TR	
D602	8-719-421-27	DIODE MA728-TX				< JACK >	
D603	8-719-067-36	DIODE MA3ZD1200LS0		J301	1-793-619-21	JACK (LINE IN (OPTICAL))	
D801	8-719-421-27	DIODE MA728-TX		J303	1-793-620-21	JACK (MIC (PLUG IN POWER))	
D802	8-719-988-61	DIODE 1SS355TE-17		J304	1-793-509-11	JACK (□)/LINE OUT)	
D803	8-719-420-51	DIODE MA729-TX		J901	1-785-383-11	JACK, DC (POLARITY UNIFIED TYPE)	(DC IN 3V)
D804	8-719-069-29	DIODE RB520S-30TE61				< COIL >	
D901	8-719-420-51	DIODE MA729-TX		L301	1-469-535-21	INDUCTOR	10uH
D902	8-719-072-26	DIODE FS1J3-TP		L302	1-469-535-21	INDUCTOR	10uH
D903	8-719-072-26	DIODE FS1J3-TP		L303	1-469-535-21	INDUCTOR	10uH
D905	8-719-074-74	DIODE MA3XD15001S0		L501	1-469-535-21	INDUCTOR	10uH
D906	8-719-074-74	DIODE MA3XD15001S0		L502	1-469-535-21	INDUCTOR	10uH
D907	8-719-072-26	DIODE FS1J3-TP		L601	1-410-389-31	INDUCTOR CHIP	47uH
		< FERRITE BEAD/RESISTOR >		L602	1-469-422-21	INDUCTOR	22uH
FB301	1-500-329-21	FERRITE BEAD INDUCTOR		L603	1-419-258-21	COIL, CHOKE	68uH
FB302	1-500-329-21	FERRITE BEAD INDUCTOR		L604	1-410-389-31	INDUCTOR CHIP	47uH
FB303	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT R90: US, CND)	L605	1-469-422-21	INDUCTOR	22uH
FB303	1-414-228-11	FERRITE BEAD INDUCTOR (R90: US, CND)		L606	1-414-407-41	INDUCTOR	330uH
FB304	1-216-864-11	METAL CHIP 0 5% 1/16W		L607	1-419-441-21	INDUCTOR	4.7uH
FB305	1-500-329-21	FERRITE BEAD INDUCTOR		L801	1-469-535-21	INDUCTOR	10uH
FB306	1-500-329-21	FERRITE BEAD INDUCTOR		L802	1-410-389-31	INDUCTOR CHIP	47uH
FB501	1-216-864-11	METAL CHIP 0 5% 1/16W		L901	1-414-400-41	INDUCTOR	22uH
FB502	1-216-864-11	METAL CHIP 0 5% 1/16W		L902	1-469-426-21	INDUCTOR	100uH
FB503	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT R90: US, CND)	L903	1-469-367-21	INDUCTOR	10uH
FB503	1-414-760-21	FERRITE, EMI (SMD) (R90: US, CND)		L904	1-419-257-21	COIL, CHOKE	22uH
FB504	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT R90: US, CND)	L905	1-419-407-21	COIL, CHOKE	33uH
FB504	1-414-229-11	FERRITE BEAD INDUCTOR (R90: US, CND)				< LINE FILTER >	
FB505	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT R90: US, CND)	LF901	1-416-405-21	FILTER, CHIP EMI (COMMON MODE)	
FB505	1-500-329-21	FERRITE BEAD INDUCTOR (R90: US, CND)				< TRANSISTOR >	
FB601	1-500-329-21	FERRITE BEAD INDUCTOR		Q101	8-729-044-58	FET SI2304DS-T1	
		< IC >		Q102	8-729-050-32	TRANSISTOR 2SC5585TL	
IC301	8-759-641-92	IC AK4517BVQ-L		Q201	8-729-044-58	FET SI2304DS-T1	
IC302	8-759-572-38	IC NJM2140R		Q202	8-729-050-32	TRANSISTOR 2SC5585TL	
IC303	8-759-641-90	IC OPA2340EA		Q301	8-729-928-81	TRANSISTOR DTC144EE-TL	
IC304	8-759-559-91	IC RN5RZ25AA-TR		Q302	8-729-046-49	FET FDV304P	
IC305	8-759-559-91	IC RN5RZ25AA-TR		Q303	8-729-929-99	TRANSISTOR UMB11-TN	
IC501	8-759-682-68	IC SN761056CDBT		Q305	8-729-046-45	FET SI2302DS-T1	
				Q306	8-729-047-48	TRANSISTOR UMD12N-TR	
				Q307	8-729-047-48	TRANSISTOR UMD12N-TR	
				Q308	8-729-047-48	TRANSISTOR UMD12N-TR	

@ Replacement of CXD2660GA (IC502) and CXR701080-013GA (IC801) used in this set require a special tool. Therefore, they cannot be replaced.

**MAIN**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q309	8-729-928-81	TRANSISTOR DTC144EE-TL		R215	1-208-683-11	METAL CHIP 1K 0.5%	1/16W
Q501	8-729-928-81	TRANSISTOR DTC144EE-TL		R216	1-218-945-11	METAL CHIP 220 0.5%	1/16W
Q601	8-729-046-43	FET HAT2051T-EL		R217	1-208-719-11	METAL CHIP 33K 0.5%	1/16W
Q602	8-729-046-42	FET HAT2050T-EL		R218	1-208-703-11	METAL CHIP 6.8K 0.5%	1/16W
Q603	8-729-046-45	FET SI2302DS-T1		R219	1-218-985-11	METAL CHIP 470K 0.5%	1/16W
Q604	8-729-047-48	TRANSISTOR UMD12N-TR		R220	1-218-849-11	METAL CHIP 3.3K 0.5%	1/16W
Q605	8-729-928-27	TRANSISTOR DTA144EE-TL		R222	1-218-953-11	RES, CHIP 1K 5%	1/16W
Q607	8-729-046-45	FET SI2302DS-T1		R301	1-218-985-11	RES, CHIP 470K 5%	1/16W
Q801	8-729-029-14	TRANSISTOR DTC144EUA-T106		R302	1-218-953-11	RES, CHIP 1K 5%	1/16W
Q802	8-729-029-14	TRANSISTOR DTC144EUA-T106		R303	1-216-864-11	METAL CHIP 0 5%	1/16W
Q803	8-729-905-35	TRANSISTOR 2SC4081T106R		R304	1-216-864-11	METAL CHIP 0 5%	1/16W
Q804	8-729-905-35	TRANSISTOR 2SC4081T106R		R305	1-218-941-11	RES, CHIP 100 5%	1/16W
Q805	8-729-905-35	TRANSISTOR 2SC4081T106R		R307	1-218-941-11	RES, CHIP 100 5%	1/16W
Q806	8-729-905-35	TRANSISTOR 2SC4081T106R		R309	1-218-941-11	RES, CHIP 100 5%	1/16W
Q807	8-729-029-14	TRANSISTOR DTC144EUA-T106		R317	1-218-941-11	RES, CHIP 100 5%	1/16W
Q809	8-729-230-60	TRANSISTOR 2SA1586YG-TE85L		R318	1-218-941-11	RES, CHIP 100 5%	1/16W
Q901	8-729-046-44	TRANSISTOR ZDT6718TA		R319	1-218-941-11	RES, CHIP 100 5%	1/16W
Q902	8-729-046-45	FET SI2302DS-T1		R320	1-216-864-11	METAL CHIP 0 5%	1/16W
Q904	8-729-043-46	FET MMBF2201NT1		R322	1-218-989-11	RES, CHIP 1M 5%	1/16W
Q905	8-729-928-27	TRANSISTOR DTA144EE-TL		R323	1-218-973-11	RES, CHIP 47K 5%	1/16W
Q906	8-729-928-81	TRANSISTOR DTC144EE-TL		R324	1-218-971-11	RES, CHIP 33K 5%	1/16W
Q1001	8-729-922-10	TRANSISTOR 2SA1577-T106-QR		R502	1-216-833-11	RES, CHIP 10K 5%	1/16W
		< RESISTOR >		R503	1-216-864-11	METAL CHIP 0 5%	1/16W
R102	1-208-715-11	METAL CHIP 22K 0.5%	1/16W	R505	1-216-864-11	METAL CHIP 0 5%	1/16W
R103	1-208-691-11	METAL CHIP 2.2K 0.5%	1/16W	R506	1-216-864-11	METAL CHIP 0 5%	1/16W
R104	1-208-683-11	METAL CHIP 1K 0.5%	1/16W	R507	1-218-971-11	RES, CHIP 33K 5%	1/16W
R105	1-208-687-11	METAL CHIP 1.5K 0.5%	1/16W	R508	1-216-809-11	RES, CHIP 100 5%	1/16W
R107	1-218-961-11	RES, CHIP 4.7K 5%	1/16W			(EXCEPT R90: US,CND, HK, JEW/ R91: HK, JEW)	
R108	1-218-953-11	RES, CHIP 1K 5%	1/16W	R508	1-216-864-11	METAL CHIP 0 5%	1/16W
R109	1-216-793-11	RES, CHIP 4.7 5%	1/16W			(R90: HK, JEW/R91: HK, JEW)	
		(EXCEPT R90: FR/R91: FR)		R508	1-218-823-11	METAL CHIP 100 0.5%	1/16W
R109	1-216-801-11	RES, CHIP 22 5%	1/16W			(R90: US, CND)	
		(R90: FR/R91: FR)		R509	1-216-809-11	RES, CHIP 100 5%	1/16W
R111	1-208-931-11	METAL CHIP 68K 0.5%	1/16W			(EXCEPT R90: US,CND, HK, JEW/ R91: HK, JEW)	
R112	1-208-927-11	METAL CHIP 47K 0.5%	1/16W	R509	1-216-864-11	METAL CHIP 0 5%	1/16W
R113	1-208-927-11	METAL CHIP 47K 0.5%	1/16W			(R90: HK, JEW/R91: HK, JEW)	
R114	1-208-927-11	METAL CHIP 47K 0.5%	1/16W	R509	1-218-839-11	METAL CHIP 470 0.5%	1/16W
R115	1-208-683-11	METAL CHIP 1K 0.5%	1/16W			(R90: US, CND)	
R116	1-218-945-11	METAL CHIP 220 0.5%	1/16W	R510	1-216-809-11	RES, CHIP 100 5%	1/16W
R117	1-208-719-11	METAL CHIP 33K 0.5%	1/16W			(EXCEPT R90: US,CND, HK, JEW/ R91: HK, JEW)	
R118	1-208-703-11	METAL CHIP 6.8K 0.5%	1/16W	R510	1-216-864-11	METAL CHIP 0 5%	1/16W
R119	1-218-985-11	METAL CHIP 470K 0.5%	1/16W			(R90: HK, JEW/R91: HK, JEW)	
R120	1-218-849-11	METAL CHIP 3.3K 0.5%	1/16W	R510	1-218-831-11	METAL CHIP 220 0.5%	1/16W
R122	1-218-953-11	RES, CHIP 1K 5%	1/16W			(R90: US, CND)	
R202	1-208-715-11	METAL CHIP 22K 0.5%	1/16W	R517	1-216-864-11	METAL CHIP 0 5%	1/16W
R203	1-208-691-11	METAL CHIP 2.2K 0.5%	1/16W	R518	1-216-845-11	METAL CHIP 100K 5%	1/16W
R204	1-208-683-11	METAL CHIP 1K 0.5%	1/16W	R519	1-216-821-11	METAL CHIP 1K 5%	1/16W
R205	1-208-687-11	METAL CHIP 1.5K 0.5%	1/16W	R520	1-216-841-11	METAL CHIP 47K 5%	1/16W
R207	1-218-961-11	RES, CHIP 4.7K 5%	1/16W	R522	1-216-803-11	METAL CHIP 33 5%	1/16W
R208	1-218-953-11	RES, CHIP 1K 5%	1/16W	R524	1-216-821-11	METAL CHIP 1K 5%	1/16W
R209	1-216-793-11	RES, CHIP 4.7 5%	1/16W	R525	1-216-857-11	METAL CHIP 1M 5%	1/16W
		(EXCEPT R90: FR/R91: FR)		R526	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R209	1-216-801-11	RES, CHIP 22 5%	1/16W	R527	1-216-811-11	METAL CHIP 150 5%	1/16W
		(R90: FR/R91: FR)		R528	1-216-855-11	METAL CHIP 680K 5%	1/16W
R211	1-208-931-11	METAL CHIP 68K 0.5%	1/16W	R529	1-216-845-11	METAL CHIP 100K 5%	1/16W
R212	1-208-927-11	METAL CHIP 47K 0.5%	1/16W	R530	1-216-833-11	RES, CHIP 10K 5%	1/16W
R213	1-208-927-11	METAL CHIP 47K 0.5%	1/16W				
R214	1-208-927-11	METAL CHIP 47K 0.5%	1/16W				

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
R535	1-216-864-11	METAL CHIP	0	5%	1/16W	R840	1-216-864-11	METAL CHIP	0	5%	1/16W
R536	1-216-864-11	METAL CHIP	0	5%	1/16W						(EXCEPT R90: US, CND)
R537	1-216-864-11	METAL CHIP	0	5%	1/16W	R901	1-219-724-11	METAL CHIP	1	1%	1/4W
R602	1-216-864-11	METAL CHIP	0	5%	1/16W	R902	1-242-996-91	METAL CHIP	0.68	1%	1/4W
R604	1-218-891-11	METAL CHIP	68K	0.5%	1/16W	R903	1-216-813-11	METAL CHIP	220	5%	1/16W
R605	1-218-891-11	METAL CHIP	68K	0.5%	1/16W	R904	1-216-833-11	RES, CHIP	10K	5%	1/16W
R606	1-216-833-11	RES, CHIP	10K	5%	1/16W	R905	1-216-864-11	METAL CHIP	0	5%	1/16W
R607	1-218-871-11	METAL CHIP	10K	0.5%	1/16W	R906	1-216-817-11	METAL CHIP	470	5%	1/16W
R608	1-216-864-11	METAL CHIP	0	5%	1/16W	R907	1-216-849-11	METAL CHIP	220K	5%	1/16W
R609	1-216-864-11	METAL CHIP	0	5%	1/16W	R908	1-216-845-11	METAL CHIP	100K	5%	1/16W
R610	1-216-853-11	METAL CHIP	470K	5%	1/16W	R909	1-216-864-11	METAL CHIP	0	5%	1/16W
R611	1-216-857-11	METAL CHIP	1M	5%	1/16W	R910	1-216-864-11	METAL CHIP	0	5%	1/16W
R612	1-216-843-11	METAL CHIP	68K	5%	1/16W	R911	1-216-864-11	METAL CHIP	0	5%	1/16W
R613	1-218-871-11	METAL CHIP	10K	0.5%	1/16W	R912	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R615	1-216-857-11	METAL CHIP	1M	5%	1/16W	R913	1-216-853-11	METAL CHIP	470K	5%	1/16W
R616	1-219-724-11	METAL CHIP	1	1%	1/4W	R914	1-218-899-11	RES, CHIP	150K	0.5%	1/16W
R617	1-216-855-11	METAL CHIP	680K	5%	1/16W	R915	1-218-887-11	RES, CHIP	47K	0.5%	1/16W
R618	1-216-855-11	METAL CHIP	680K	5%	1/16W	R916	1-208-931-11	RES, CHIP	68K	0.5%	1/16W
R619	1-216-833-11	RES, CHIP	10K	5%	1/16W	R918	1-216-837-11	METAL CHIP	22K	5%	1/16W
R620	1-216-857-11	METAL CHIP	1M	5%	1/16W	R919	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R621	1-216-833-11	RES, CHIP	10K	5%	1/16W	R921	1-216-853-11	METAL CHIP	470K	5%	1/16W
R636	1-216-821-11	METAL CHIP	1K	5%	1/16W	R922	1-216-797-11	METAL CHIP	10	5%	1/16W
R801	1-216-857-11	METAL CHIP	1M	5%	1/16W	R923	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R802	1-216-851-11	METAL CHIP	330K	5%	1/16W	R924	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R803	1-216-864-11	METAL CHIP	0	5%	1/16W	R927	1-216-847-11	METAL CHIP	150K	5%	1/16W
R804	1-216-864-11	METAL CHIP	0	5%	1/16W	R928	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R805	1-216-864-11	METAL CHIP	0	5%	1/16W	R929	1-216-835-11	METAL CHIP	15K	5%	1/16W
					(EXCEPT R90 : US, CND)	R930	1-216-857-11	METAL CHIP	1M	5%	1/16W
R806	1-216-864-11	METAL CHIP	0	5%	1/16W	R931	1-216-833-11	RES, CHIP	10K	5%	1/16W
R807	1-216-864-11	METAL CHIP	0	5%	1/16W	R932	1-216-857-11	METAL CHIP	1M	5%	1/16W
R808	1-216-841-11	METAL CHIP	47K	5%	1/16W	R934	1-216-835-11	METAL CHIP	15K	5%	1/16W
R809	1-216-849-11	METAL CHIP	220K	5%	1/16W	R935	1-216-864-11	METAL CHIP	0	5%	1/16W
R810	1-218-977-11	RES, CHIP	100K	5%	1/16W	R936	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R811	1-216-853-11	METAL CHIP	470K	5%	1/16W	R937	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R812	1-218-903-11	METAL CHIP	220K	0.5%	1/16W	R938	1-216-853-11	METAL CHIP	470K	5%	1/16W
R813	1-218-903-11	METAL CHIP	220K	0.5%	1/16W	R939	1-216-847-11	METAL CHIP	150K	5%	1/16W
R814	1-216-845-11	METAL CHIP	100K	5%	1/16W	R940	1-216-833-11	RES, CHIP	10K	5%	1/16W
R815	1-216-853-11	METAL CHIP	470K	5%	1/16W	R941	1-208-927-11	RES, CHIP	47K	0.5%	1/16W
R816	1-218-989-11	METAL CHIP	1M	0.5%	1/16W	R1001	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R817	1-216-851-11	METAL CHIP	330K	5%	1/16W	R1002	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R818	1-216-841-11	METAL CHIP	47K	5%	1/16W	R1003	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R819	1-216-821-11	METAL CHIP	1K	5%	1/16W	R1004	1-216-853-11	METAL CHIP	470K	5%	1/16W
R820	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R1005	1-219-724-11	METAL CHIP	1	1%	1/4W
R821	1-216-821-11	METAL CHIP	1K	5%	1/16W	R1006	1-218-977-11	RES, CHIP	100K	5%	1/16W
R822	1-216-841-11	METAL CHIP	47K	5%	1/16W	R1010	1-218-867-11	METAL CHIP	6.8K	0.5%	1/16W
R823	1-216-833-11	RES, CHIP	10K	5%	1/16W						< COMPOSITION CIRCUIT BLOCK >
R824	1-216-841-11	METAL CHIP	47K	5%	1/16W	RB301	1-233-971-11	RES, NETWORK (CHIP TYPE)	47K		
R825	1-216-833-11	RES, CHIP	10K	5%	1/16W	RB302	1-233-961-11	RES, NETWORK (CHIP TYPE)	1K		
R826	1-216-821-11	METAL CHIP	1K	5%	1/16W	RB601	1-233-965-11	RES, NETWORK (CHIP TYPE)	4.7K		
R827	1-216-841-11	METAL CHIP	47K	5%	1/16W	RB602	1-233-979-11	RES, NETWORK (CHIP TYPE)	1M		
R828	1-216-841-11	METAL CHIP	47K	5%	1/16W	RB603	1-233-965-11	RES, NETWORK (CHIP TYPE)	4.7K		
R829	1-216-864-11	METAL CHIP	0	5%	1/16W						< SWITCH >
R830	1-216-853-11	METAL CHIP	470K	5%	1/16W	S801	1-762-805-21	SWITCH, PUSH (1KEY)			(OPEN/CLOSE DETECT)
R831	1-216-853-11	METAL CHIP	470K	5%	1/16W	S802	1-762-947-12	SWITCH, PUSH (1KEY) (OPEN $\rightarrow$ )			
R833	1-216-857-11	METAL CHIP	1M	5%	1/16W	S803	1-771-248-11	SWITCH, TACTILE (T MARK)			
R834	1-218-887-11	METAL CHIP	47K	0.5%	1/16W						
R835	1-218-887-11	METAL CHIP	47K	0.5%	1/16W						
R838	1-216-864-11	METAL CHIP	0	5%	1/16W						

**MAIN**

Ref. No.	Part No.	Description	Remark
S804	1-771-770-21	SWITCH, SLIDE (HOLD)	
S806	1-771-860-21	SWITCH, PUSH (PROTECT DETECT)	
S807	1-771-770-21	SWITCH, SLIDE (SYNCHRO REC)	
S901	1-771-806-21	SWITCH, PUSH (1KEY) (BATTERY IN DETECT)	
		< THERMISTOR >	
TH901	1-803-795-21	THERMISTOR, POSITIVE	
		< VIBRATOR >	
X501	1-781-574-21	VIBRATOR, CRYSTAL (22.5792MHz)	
X801	1-781-575-21	VIBRATOR, CERAMIC (19.9344MHz)	
X802	1-781-525-21	VIBRATOR, CRYSTAL (32.768kHz)	

\*\*\*\*\*

MISCELLANEOUS

\*\*\*\*\*

6	1-756-028-11	BATTERY	
7	1-803-759-11	LCD MODULE	
57	1-756-028-11	BATTERY	
58	1-803-759-11	LCD MODULE	
151	1-675-466-11	MOTOR FLEXIBLE BOARD	
△ 168	X-4952-386-1	SERVICE ASSY, OP	
M601	8-835-666-01	MOTOR, DC SSM-01C14A (SPINDLE) (WITH TURN TABLE)	
M602	1-763-399-11	MOTOR, DC (SLED) (WITH GEAR)	
M603	1-763-400-11	MOTOR, DC (OVER WRITE HEAD UP/DOWN)	

\*\*\*\*\*

ACCESSORIES & PACKING MATERIALS

\*\*\*\*\*

△	1-418-028-11	ADAPTOR, AC (AC-MZR55) (R90: E, JEW/R91: JEW)	
△	1-418-049-11	ADAPTOR, AC (AC-MZR55) (R90: UK, HK/R91: UK, HK)	
△	1-418-275-11	ADAPTOR, AC (AC-MZR55) (R90: US, CND)	
△	1-418-276-11	ADAPTOR, AC (AC-MZR55) (R90: AEP, FR/R91: AEP, FR)	
△	1-418-277-11	ADAPTOR, AC (AC-MZR55) (R90: AUS)	
	1-418-493-11	REMOTECONTROL UNIT (RM-MZ2S) (BLACK) (R90: US, HK, CH, JEW)	
	1-418-493-51	REMOTECONTROL UNIT (RM-MZ2S) (SILVER) (EXCEPT R90: US/R91)	
	1-418-493-61	REMOTECONTROL UNIT (RM-MZ2S) (CLEAR) (R91)	
△	1-418-784-11	ADAPTOR (AC-MZR70), AC (R90: CH)	
△	1-569-007-11	ADAPTOR, CONVERSION 2P (R90: CH, JEW/R91: JEW)	
	1-756-023-11	CASE, BATTERY (for SIZE R6 (AA) BATTERY)	
	1-756-036-11	BATTERY, NICKEL HYDROGEN (NH-14WM)	
	1-779-504-11	CONNECTOR, OPTICAL (EXCEPT R90: HK CH, JEW/R91: HK, JEW)	
	1-779-504-51	CONNECTOR, OPTICAL (R90: HK, CH, JEW/R91: HK, JEW)	
	3-043-060-01	CASE, CHARGE (C/D)	
	3-045-575-01	CASE, CARRYING	
	3-867-571-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH, PORTUGUESE, SWEDISH, FINNISH, RUSSIAN) (R90: AEP, UK, E, HK, JEW/ R91: AEP, UK, HK, JEW)	

Ref. No.	Part No.	Description	Remark
	3-867-571-21	MANUAL, INSTRUCTION (ENGLISH) (R90: US, AUS, CH)	
	3-867-571-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, DUTCH, ITALIAN) (R90: CND, AEP, FR/R91: AEP, FR)	
	3-867-571-41	MANUAL, INSTRUCTION (JAPANESE, CHINESE, KOREAN) (R90: E, HK, JEW/R91: HK, JEW)	
	3-867-571-51	MANUAL, INSTRUCTION (CHINESE) (R90: CH)	
	8-953-278-90	HEADPHONE MDR-A34SP (R90: US)	
	8-953-304-90	RECEIVER MDR-E805SP (EXCEPT R90: US)	

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

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

# MZ-R90/R91

**SONY®**

## **SERVICE MANUAL**

**2000. 07**

*US Model*  
*Canadian Model*  
*Australian Model*  
*Chinese Model*  
*MZ-R90*

*AEP Model*  
*UK Model*  
*E Model*  
*Tourist Model*  
*MZ-R90/R91*

## **SUPPLEMENT-1**

File this supplement with the service manual.

**Subject:**

- 1. Addition of Korean Model**
- 2. Correction**

(ENG-00014)

## 1. Addition of Korean Model

Korean Model has been added.

This is the same as Hong Kong model which is not described in this supplement-1.

Refer to MZ-R90/R91 original service manual (9-927-187-00) for other information.

### • EXPLODED VIEWS

Page	Hong Kong Model				Korean Model			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
55	107	A-3323-491-A	MAIN BOARD, COMPLETE (R90: HK, JEW/R91: HK, JEW)		107	A-3323-292-A	MAIN BOARD, COMPLETE (R90: KR/R91: KR)	

### • ELECTRICAL PARTS LIST

Page	Hong Kong Model				Korean Model				
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark	
57		A-3323-491-A	MAIN BOARD, COMPLETE (R90: HK, JEW/R91: HK, JEW)			A-3323-292-A	MAIN BOARD, COMPLETE (R90: KR/R91: KR)		
58	C899	1-164-217-11	CERAMIC CHIP 150PF 5% 50V (EXCEPT R90: US, CND)		R805	1-216-864-11	METAL CHIP 0 5% 1/16W (R90: KR/R91: KR)		
62	△	1-418-049-11	ADAPTOR, AC (AC-MZR55) (R90: UK, HK/R91: UK, HK)			3-867-571-01	MANUAL, INSTRUCTION (JAPANESE, KOREAN) (R90: KR/R91: KR)		
		ACCESSORIES & PACKING MATERIALS *****					ACCESSORIES & PACKING MATERIALS *****  (Korean model has no AC adaptors.)		


The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
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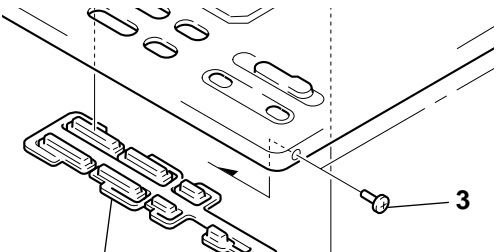
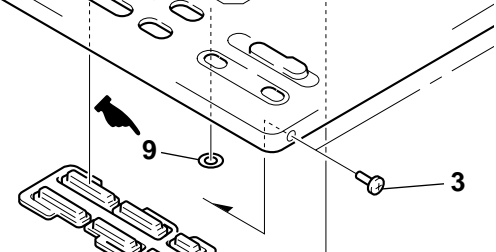
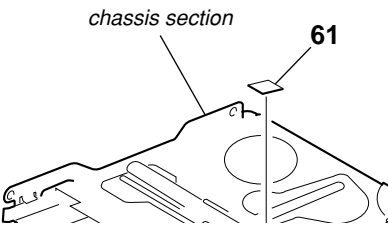
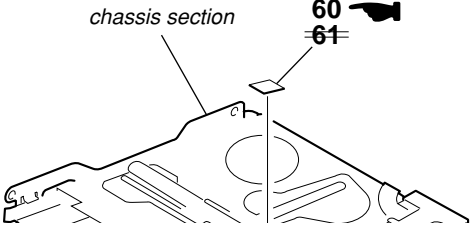
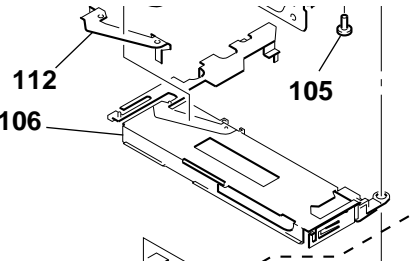
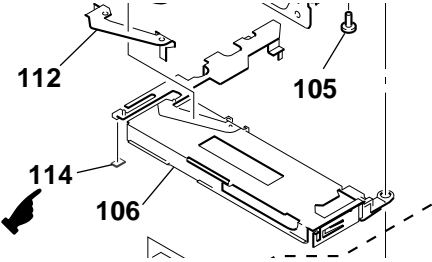
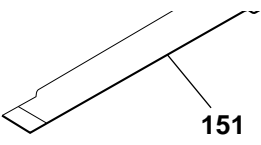
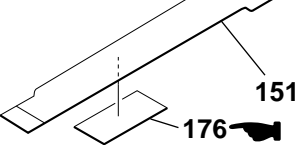
#### • Abbreviation

CND : Canadian model  
 HK : Hong Kong model  
 JEW : Tourist model  
 KR : Korean model



## 2. Correction EXPLODED VIEWS

 : Indicates changed portion.

Page	INCORRECT	CORRECT																
53																		
	<table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Ref. No.	Part No.	Description	Remark					<table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>3-048-299-01</td> <td>WASHER (LCD)</td> <td></td> </tr> </tbody> </table>	Ref. No.	Part No.	Description	Remark	9	3-048-299-01	WASHER (LCD)	
Ref. No.	Part No.	Description	Remark															
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Ref. No.	Part No.	Description	Remark															
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56																		
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Ref. No.	Part No.	Description	Remark															
Ref. No.	Part No.	Description	Remark															
176	3-222-363-01	SPACER (FLEXIBLE)																

• **ELECTRICAL PARTS LIST**

Page	INCORRECT				CORRECT			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
59	IC501	8-759-661-14	IC SN761056ADBT		IC501	8-759-682-68	IC SN761056CDBT	
	IC601	8-759-642-14	IC MPC17A56FTA		IC601	8-759-678-83	IC MPC17A56FTAEB	
	IC901	8-759-642-13	IC MPC18A31FTA		IC901	8-759-678-82	IC MPC18A31FTAEB	
	Q101	8-729-046-45	FET SI2302DS-T1		Q101	8-729-044-58	FET SI2304DS-T1	
	Q201	8-729-046-45	FET SI2302DS-T1		Q201	8-729-044-58	FET SI2304DS-T1	

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