MZ-E500

SERVICE MANUAL

Ver 1.0 2000. 12
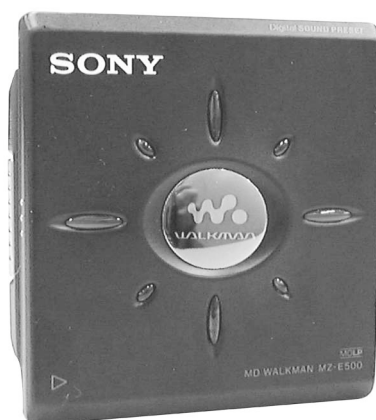
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Laboratories Licensing Corporation

Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MT-MZE500-174
Optical Pick-up Mechanism Type	LCX-4E

SPECIFICATIONS

Audio playing system
MiniDisc digital audio system

Laser diode properties
Material: GaAlAs
Wavelength: λ = 790 nm
Emission duration: continuous
Laser output: less than 44.6 μW*
* This output is the value measured at a distance of 200 mm from the
objective lens surface on the optical pick-up block with 7 mm aperture.

Revolutions
Approx. 300 rpm to 2,700 rpm

Error correction
ACIRC (Advanced Cross Interleave Reed Solomon Code)

Sampling frequency
44.1 kHz

Coding
ATRAC (Adaptive Transform Acoustic Coding)
ATRAC3: LP2
ATRAC3: LP4

Modulation system
EFM (Eight to Fourteen Modulation)

Number of channels
2 stereo channels
1 monaural channel

Frequency response
20 to 20,000 Hz ± 3 dB

Wow and Flutter
Below measurable limits

Outputs
Headphones/earphones: stereo mini-jack, maximum output level 5 mW +
5 mW, load impedance 16 ohms

Power requirements
Nickel Cadmium rechargeable battery
One NC-6WM (supplied): 1.2V, 600 mAh
One LR6 (size AA) battery (not supplied)
External power jack: Power rating 1.5V DC

Battery operation time

Battery life			*(EIAJ[1])*
Batteries	Stereo (normal)	LP2 Stereo	LP4 Stereo
Ni-Cd rechargeable battery NC-6WM[2]	14	16	18
LR6 (SG) Sony Alkaline dry battery[3]	42	49	58
LR6 (SG)[3] and NC-6WM[2]	59	65	75

(Unit: Approx. hours)

[1] Measured in accordance with the EIAJ (Electronic Industries
Association of Japan) standard (using a Sony MDW-series Mini-disc).
[2] With a fully charged battery
[3] When using a Sony LR6 (SG) "STAMINA" alkaline dry battery
(produced in Japan).

Note
The battery life may be shorter depending on operating conditions, the
surrounding temperature, and the battery type.

Dimensions
Approx. $74.5 \times 17.7 \times 80.5$ mm (w/h/d) ($3 \times {}^{23}/_{32} \times 3 {}^1/_4$ in.)
(not including projecting parts and controls)

Mass
Approx. 76g (2.7 oz) (the player only)

Supplied accessories
Headphones/earphones with a remote control (1)
Battery charger (1)
Rechargeable battery (1)
Rechargeable battery carrying case (1)
Dry battery case (1)
Carrying pouch (1) (except for the U.S.A model)
AC plug adaptor (1) (world model only)

Design and specifications are subject to change without notice.

PORTABLE MINIDISC PLAYER

SONY®

TABLE OF CONTENTS

CAUTION

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

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.

SAFETY-RELATED COMPONENT WARNING!!

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

SECTION 1
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-4E)
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.

laser-tap
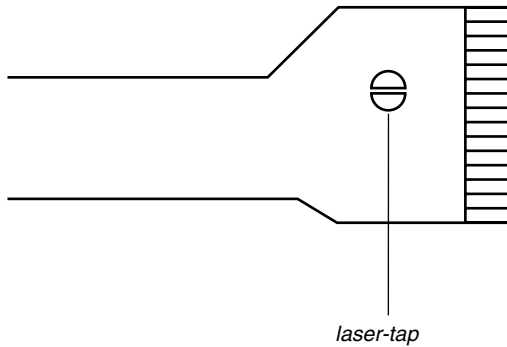
OPTICAL PICK-UP FLEXIBLE BOARD

When repairing this device with the power on, if you remove the main board, this device stops working.
In this case, you work without the device stopping by fastening the hook of the Open/Close detection switch (S809).

Open/Colse detection switch (S809)
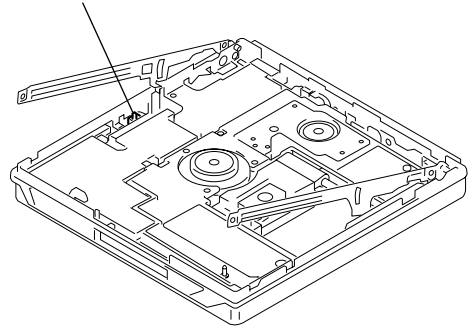
* Replacement of CXD2671-203GA (IC601) used in this set requires a special tool.

This section is extracted from instruction manual.

LOCATION AND FUNCTION OF CONTROLS

VOL +/–   ■   I◀◀

②   VOL+

VOL–

▶ ▶▶I

① ▶ ▶▶I

II

I◀◀

■

OPERATE lamp
Indicador OPERATE

PLAYMODE   RPT/ENT

DISPLAY   SOUND

HOLD

I◀◀ / ▶ ▶▶I

VOL +/–

■

AVLS

PLAY MODE

HOLD

SECTION 3
DISASSEMBLY

● Disassemble the unit in the order as shown below.

Set ➞ "Panel block assy, upper", "Holder assy" ➞ Mechanism deck ┬➞ Bracket assy ➞ Main board
                                                                └➞ Optical pick-up block

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

3-1. "PANEL BLOCK ASSY, UPPER","HOLDER ASSY"

Panel block assy, upper

❶ Screws (MI 1.4 × 1.6)

❶ Screws (MI 1.4 × 2.5)

❸ Move it away from projection

❷

Holder assy

❸ Move it away from projection

Case (rear)

3-2. MECHANISM DECK

❶ Screw (MD), step

Mechanism deck

❺ Motor flexible board

❸

❹ OP flexible board

❷ Claw

— 5 —

3-3. BRACKET ASSY

Bracket assy

① *Screws (1.7)*

Projections

②

3-4. MAIN BOARD

⑥ *Remove the soldering*

Main board

④

① *Claw*

③ *Screws (1.7)*

② *Lid, battery case*

Case (battery)

⑥ *Remove the soldring*

⑤

Case (rear)

3-5. OPTICAL PICK-UP BLOCK

Optical pick-up block (LCX-4E)

❶ *Washer*

❷ *Gear (SA)*

❺

❸ *Screw (M 1.4)*

❹ *Spring, thrust detent*

4-1. GENERAL
- When entered in the TEST MODE, this set provides the Overall Adjustment mode which allows CD and MO discs to be automatically adjusted. In the Overall Adjustment mode, the system discriminates between CD and MO discs, performs adjustments in sequence automatically, and displays the faulty location if any fault is found. In the Manual mode, selected adjustments can be performed automatically.
- The attached remote control is used to operate the TEST MODE. Unless otherwise specified in the text, the key means that on the remote control.

4-2. SETTING THE TEST MODE
4-2-1. How to set the TEST MODE
To set the TEST MODE, two methods are available.
① Solder bridge and short TAP601 (TEST) on the main board. Then turn on the power.

MAIN BOARD (SIDE B)

TAP601
(OPEN : Normal mode)
(SHORT : Test mode)
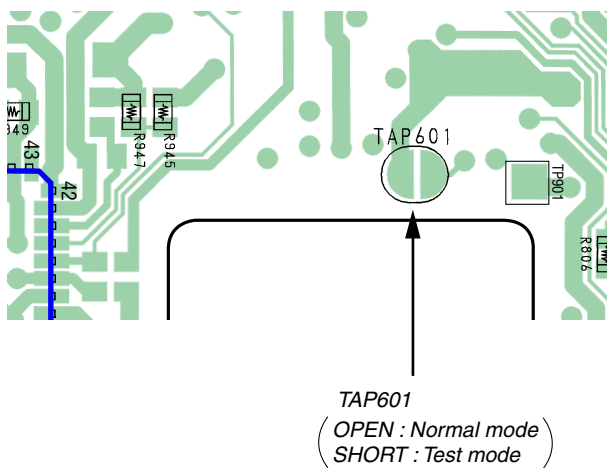
② In the normal mode, operate the keys on the set and those on the remote control as specified below:
Turn on HOLD switch on the set. Holding down ■ (STOP) key on the set, press the keys on the remote control in the following sequence:
▶▶│ ▶ → ▶▶│ ▶ → │◀◀ → │◀◀ → ▶▶│ ▶
→ │◀◀ → ▶▶│ ▶ → │◀◀ → ❚❚ → ❚❚
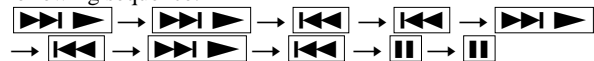
4-2-2. Operations when the TEST MODE is set
When the TEST MODE is entered, the system switches to the display check mode within the TEST MODE. From this mode, the other Test modes can be accessed.
When the TEST MODE is set, the LCD repeats a cycle of the following displays:

Remote control LCD

All on

All off

009 V1.050

Microprocessor version display
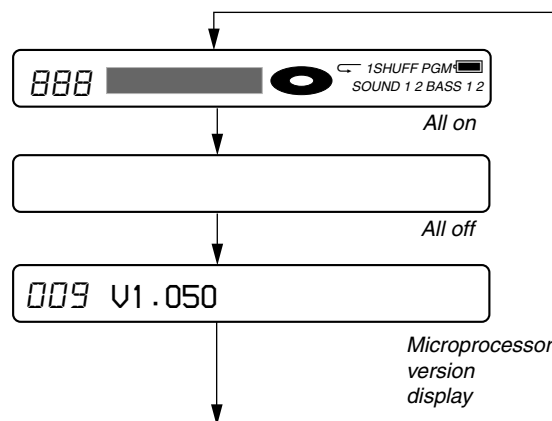
- Press and hold down ❚❚ to hold the current display while the key is being pressed.

4-2-3. How to release the TEST MODE
When method ① was used:
Turn off the power and open the solder bridge on TAP601 on the main board.
Note : The solder should be removed clean. The remaining solder may make a short with the chassis and other part.
When method ② was used:
Turn off the power.
Note : If electrical adjustment (see page 12) has not been finished completely, always start in the test mode. (The set cannot start in normal mode)

4-3. TEST MODE STRUCTURE
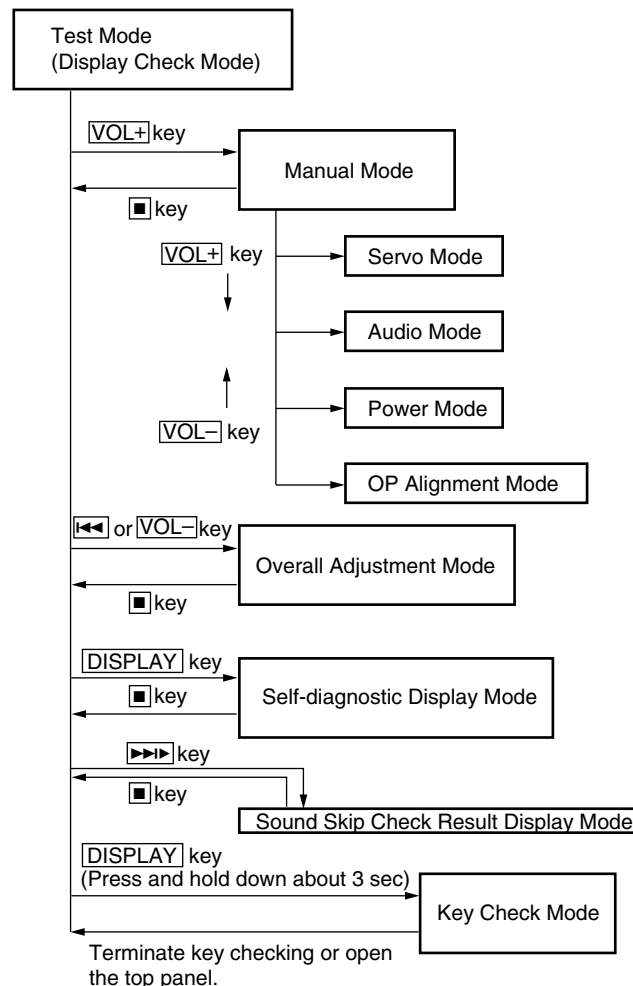
4-4. MANUAL MODE

4-4-1. Outline of the function

The Manual mode is designed to perform adjustments and operational checks on the set's operation according to each individual function.

Usually, no adjustments are made in this mode.

However, the Manual mode is used to clear the memory before performing automatic adjustments in the Overall Adjustment mode.

4-4-2. How to set the Manual mode

1. Set the TEST MODE and press VOL+ key to set the Manual mode.

   Remote control LCD display

   ```
   ┌─────────────────────────────┐
   │  000 Manual                 │
   └─────────────────────────────┘
   ```
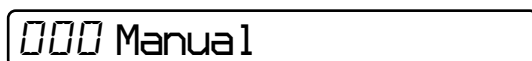
2. During each test, press and hold down ▶▶▮ ▶ key or ▮◀◀ key for a while to move the optical pickup on the sled outer or inner perimeter.

3. Each test item is assigned with a three-digit item number. The 100th place is a major item, 10th place is a middle item, and unit place is a minor item.


```
Change Major Item
```
VOL+ key : 100th place of mode number increase
VOL− key : 100th place of mode number decrease

▶▶▮ ▶ key   ■ key

```
Change Middle Item
```
VOL+ key : 10th place of mode number increase
VOL− key : 10th place of mode number decrease

▶▶▮ ▶ key   ■ key

```
Change Minor Item
```
▶▶▮ ▶ key : Unit place of mode number increase
▮◀◀ key : Unit place of mode number decrease

```
Change Adjustment Value
```
VOL+ key : Up
VOL− key : Down

```
Write Adjustment Value
```

❙❙ key : When adjusted value is changed :
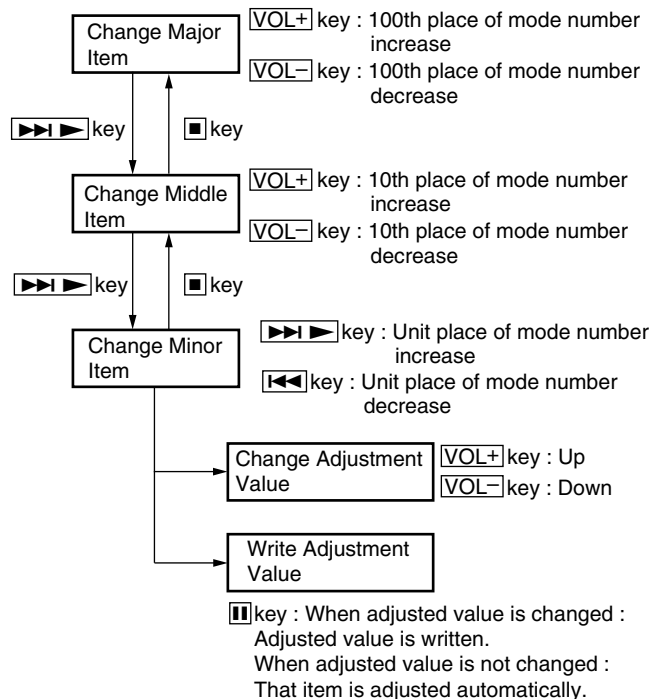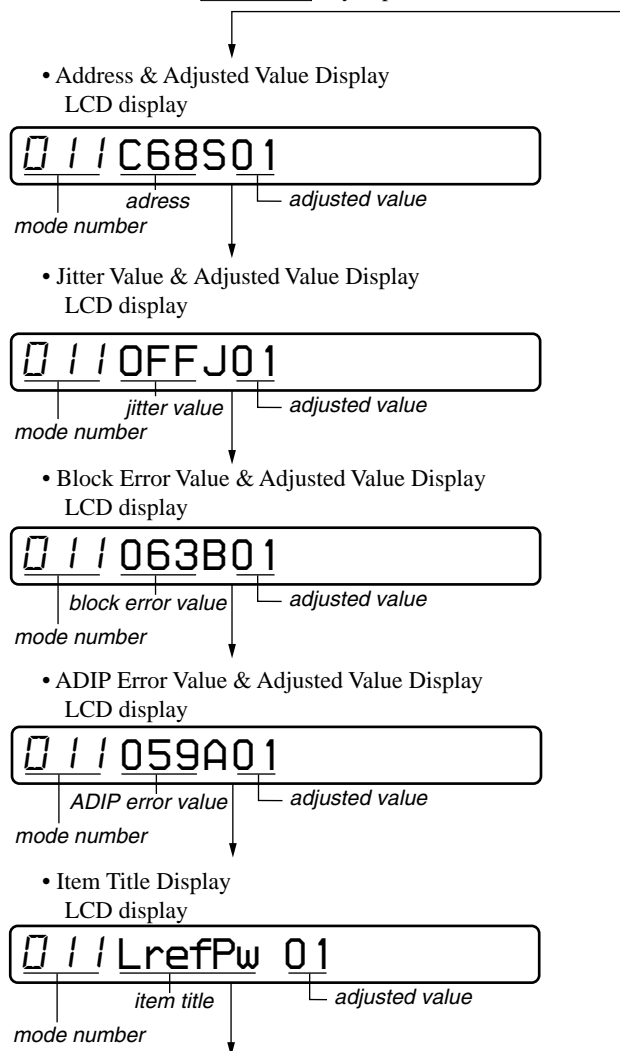   Adjusted value is written.
   When adjusted value is not changed :
   That item is adjusted automatically.

4. During each test mode, the display is changed from one to another each time DISPLAY key is pressed.

   • Address & Adjusted Value Display
     LCD display

   ```
   ┌─────────────────────────────┐
   │  011 C68S01                 │
   └─────────────────────────────┘
   ```
   adress — *adjusted value*
   mode number

   • Jitter Value & Adjusted Value Display
     LCD display

   ```
   ┌─────────────────────────────┐
   │  011 OFFJ01                 │
   └─────────────────────────────┘
   ```
   jitter value — *adjusted value*
   mode number

   • Block Error Value & Adjusted Value Display
     LCD display

   ```
   ┌─────────────────────────────┐
   │  011 063B01                 │
   └─────────────────────────────┘
   ```
   block error value — *adjusted value*
   mode number

   • ADIP Error Value & Adjusted Value Display
     LCD display

   ```
   ┌─────────────────────────────┐
   │  011 059A01                 │
   └─────────────────────────────┘
   ```
   ADIP error value — *adjusted value*
   mode number

   • Item Title Display
     LCD display

   ```
   ┌─────────────────────────────┐
   │  011 LrefPw 01              │
   └─────────────────────────────┘
   ```
   item title — *adjusted value*
   mode number

Note: In the Power mode, the item title display is only displayed.

5. To terminate the Manual mode and return to the TEST MODE, press ■ key.

4-5. OVERALL ADJUSTMENT MODE

4-5-1. Outline of the function

This mode is designed to adjust the servo system automatically by going through all the adjustment items.

The power adjustment manual setting is performed in this mode also. Usually, this mode is used to perform automatic adjustments when servicing the set.

For further information, refer to section 5. ELECTRICAL ADJUSTMENTS. (See page 12)

4-6. SELF-DIAGNOSTIC DISPLAY MODE

4-6-1. Outline of the function

The Self-diagnostic system is used in this set. If an error occurs during playback, this system detects the fault through the microprocessor's mechanism and power control blocks and stores the cause in EEPROM in a history format.
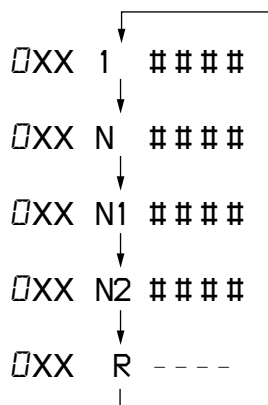
This history, which can be viewed in the TEST MODE, provides the means of locating the fault in troubleshooting.

4-6-2. Self-diagnostic mode

1. Set the TEST MODE.
2. With all the LCD display segments blinking on the set, press DISPLAY key and the Self-diagnostic mode is entered.

```
00 1 1  Adrs
```

History code — Simplified contents
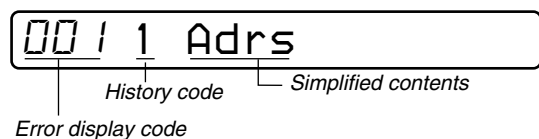
Error display code

3. Hereinafter, each time ►►I ► key is pressed, the reference information display changes as follows:

```
口XX 1  ♯♯♯♯
     ↓
口XX N  ♯♯♯♯
     ↓
口XX N1 ♯♯♯♯
     ↓
口XX N2 ♯♯♯♯
     ↓
口XX R  - - - -
```

• Press I◄◄ key to go back to the previous display.

• Contents of the history codes

History code number	Contents
1	The first error that occurred.
N	The last error that occurred.
N-1	The first error from the last one.
N-2	The second error from the last one.
R	Total recording time (− − − − is displayed for MZ-E500)

• Description of the error display codes

Contents of fault	Display code	Meaning of code	Simplified contents	Description
No error	00	No error	− − − −	No error
Servo system error	01	Access target address illegally specified	Adrs	An attempt to access an abnormal address.
	02	HIGH TEMP	Temp	HIGH TEMP
	03	FOCUS ERROR	Fcus	Focus off-center.
	04	SPINDLE ERROR	Spdl	Abnormal rotation of disc
TOC error	11	TOC ERROR	TOC	Faulty TOC contents
Power system error	12	READ DATA ERROR	Data	Data could not be read at SYNC
Offset error	22	LOWBATT	LBat	Instantaneous interruption detected.
	31	OFFSET ERROR	Ofst	Offset error
	32	FE_ABCD_OFFSET_ERR	ABCD	FE ABCD Offset error
	33	TE_OFFSET_ERR	TE	TE Offset error
	34	X1_TE_OFFSET_ERR	X1TE	X1 TE Offset error

4-6-3. Clearing the error display code

After servicing, reset the error display code.

1. Set the TEST MODE.
2. Pressing the DISPLAY key on the remote control activates the self-diagnosis display mode.
3. To reset the error display code, press II key (2 times)on the remote control when the code is displayed. (except "R - - - -")
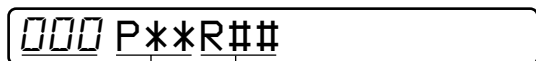   (All the data on the 1st, N, N-1 and N-2 will be reset)

4-7. Sound Skip Check Result Display Mode

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

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

1. Setting the test mode.
2. Pressing the ▶▶I ▶ key activates the sound skip check result display mode where the LCD displays as shown below.

   LCD display

   ```
   ┌─────────────────────────┐
   │ 000 P**R##              │
   └─────────────────────────┘
   ```

   ── Total of record system error count

   ── Total of play system error count

3. When ▶▶I ▶ key is pressed, the total of error count is displayed on the LCD, and each time the ▶▶I ▶ key is pressed, the error count descents one by one as shown below. Also, when I◀◀ key is pressed, the error count ascends one by one.

   ```
            ▼
   000 P**R00
            ↕
   000 EIB **
            ↕
   000 Stat**
            ↕
   000 Adrs**
            ↕
   000 BEmp**
            ↕
   000 ######
            │
   ```

P**R00 : Total of play system error and record system error count
** : 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	Decorder status error
	Adrs	Cannot access the address
	BEmp	Buffer becomes empty

4. Press the ■ key to terminate the sound skip check result display mode and to return to the test mode. (Display check mode)

4-8. KEY CHECK MODE

4-8-1. Outline of the function

This mode is used to check to make sure that each of the keys (including the slide switch) on the set operates normally.(The 1 kHz signal is outputted from the L and R channels of head phones)

4-8-2. Setting the Key Check mode

1. Set the TEST MODE. Press and hold down DISPLAY key (for more than 3 sec) to set the Key Check mode.

   LCD display

   ```
   ┌─────────────────────────┐
   │ 000         OF          │
   └─────────────────────────┘
   ```
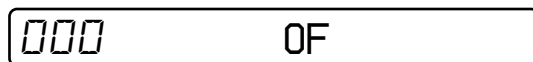
2. When each key on the set and on remote control is pressed, its name is displayed on the LCD. (The operated position is displayed for 4 sec after the slide switch is operated. If any other key is pressed during this display, the LCD switches to its name display)

   Example: When ▶▶I ▶ key on the set is pressed:

   LCD display

   ```
   ┌─────────────────────────┐
   │ 000  FF      OF         │
   └─────────────────────────┘
   ```
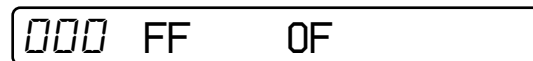
   Example: When ▶▶I ▶ key on the remote control is pressed:

   LCD display

   ```
   ┌─────────────────────────┐
   │ 000  rPLAY   XX         │
   └─────────────────────────┘
   ```

   XX: AD value of the remote control key (hexadecimal 00 to FF)

3. When all the keys on the set and on the remote control are considered as OK, the following displays are shown for 2 sec. (The key pressed to enter the Key Check mode has been checked even if it is not pressed in this mode)

   Example: When the keys on the set are considered as OK:

   LCD display

   ```
   ┌─────────────────────────┐
   │ 888  SET OK OF  ✥       │
   └─────────────────────────┘
   ```
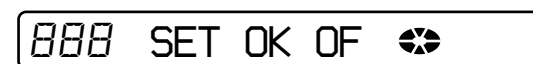
   Example: When the keys on the remote control are considered as OK:

   LCD display

   ```
   ┌─────────────────────────┐
   │ 888  RMC OK OX  ◯       │
   └─────────────────────────┘
   ```

4. When all the key have been checked or when the top panel is opened during this checking, the system terminates the Key Check mode and return to the TEST MODE.

SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. GENERAL

In this set, CD and MO discs can be automatically adjusted by setting the Overall Adjustment mode within the TEST MODE,
Before performing these automatic adjustments, it is necessary to clear the memory and adjust the power in the Manual mode.

5-2. NOTES FOR ADJUSTMENT

5-2-1. Jigs
• CD disc   TDYS-1 (part code: 4-963-646-01)
• MO disc   PTDM-1 (part code: J-2501-054-A)
                  or commercially available MO disc (recorded)
• Digital voltmeter

5-2-2. Adjustment sequence
The adjustments should be always performed in the following sequence:

① Reset NV (Clear the memory) ⎫
② Manual power adjustments ⎬ Manual mode
③ Electrical offset adjustments ⎭
   (Do not enter the disc)
④ Overall CD adjustments ⎫
                          ⎬ Overall adjustment mode
⑤ Overall MO adjustments ⎭
⑥ RESUME clear ⎫ Manual mode
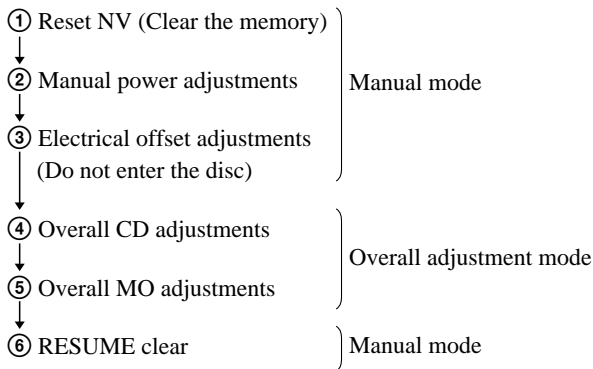
5-2-3. Power
The power is supplied with 1.5 V DC from the battery case.

5-3. RESET NV

5-3-1. How to reset NV
1. Set the TEST MODE.

2. Set the Manual mode and set the item No. 021, Reset NV.
   LCD display

   `021 Res NV CC`

3. Press ❚❚ key on the remote control.

   LCD display

   `021 Res OK?`
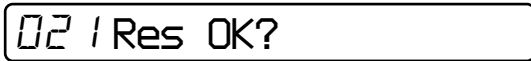
4. Press ❚❚ key on the remote control again.

   LCD display

   `021 Res ***`

   After reset is completed.

   `021 Reset!`
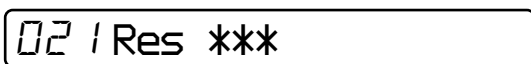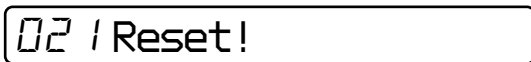
5. Press ■ key to terminate the Manual mode and return to the TEST MODE.

5-4. MANUAL POWER ADJUSTMENTS

5-4-1. Adjustment sequence
The adjustments should be always performed in the following sequence:

① Vc PWM Duty (L) adjustment (item No.:762)

② Vc PWM Duty (H) adjustment (item No.:763)

③ VLL PWM Duty adjustment (item No.:764)

5-4-2. Vc PWM Duty (L) adjustment method
1. Confirm that the power voltage is at 1.5 V DC.

2. Set the TEST MODE.

3. To set the overall adjustment mode, press VOL– key.

   LCD display

   `000 Assy 00`

4. Press PLAY MODE key, and item No. will change to 762.

   LCD display

   `762 Vc1PWM XX`
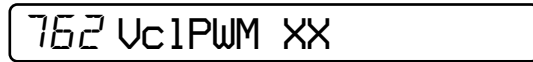
5. Connect a digital voltmeter to TP901 (VC) on the main board and adjust VOL+ key (voltage up) and VOL– key (voltage down) on the remote control.
   Adjustment value:2.36V
   Standard value:2.35 to 2.365V

   MAIN BOARD (SIDE B)

digital voltmeter
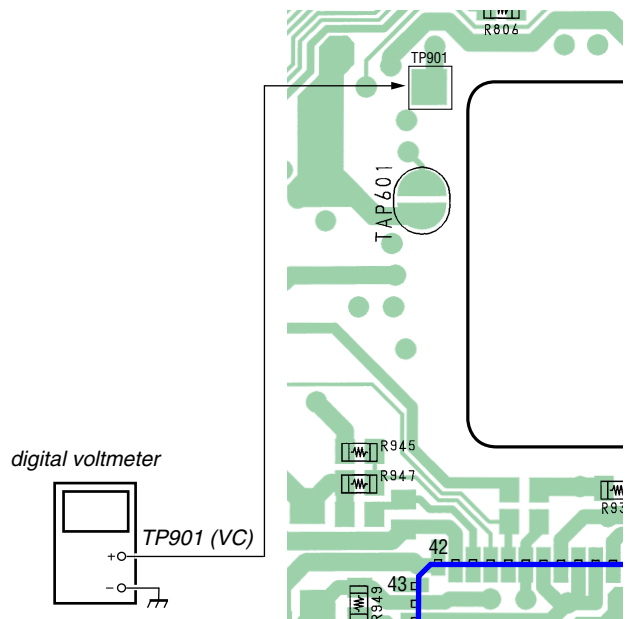
TP901 (VC)

6. Press ❚❚ key to write the adjustment value. Item No.will change to 763.

5-4-3. Vc PWM Duty (H) adjustment method

1. Set the Manual mode and set the item No. to 763.

   LCD display
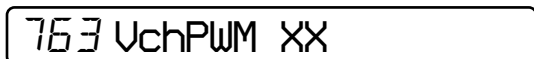
   ```
   763 VchPWM XX
   ```

2. Connect a digital voltmeter to TP901(VC) on the main board and adjust |VOL+| key and |VOL–| key on the remote control.
   Adjustment value:2.75V
   Standard value:2.735 to 2.765V

<div align="center">

MAIN BOARD (SIDE B)

</div>
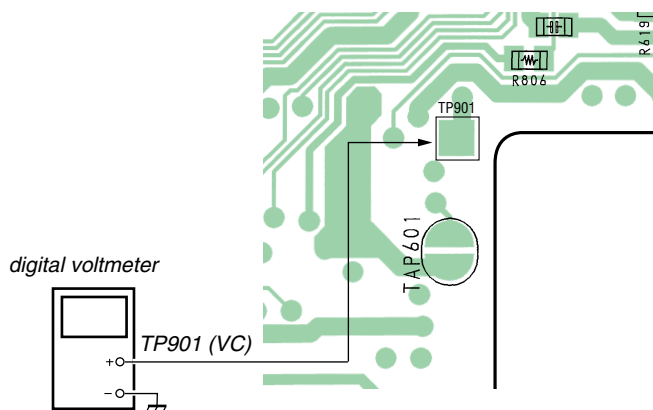
3. Press |II| key to write the adjustment value.(Item No. will change to 764)

5-4-4. VLL PWM Duty adjustment method

1. Set the Manual mode and set the item No. to 764.

   LCD display

   ```
   764 V1 PWM XX
   ```
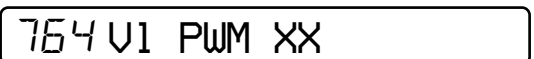
2. Connect a digital voltmeter to TP917 (VL) on the main board and adjust |VOL+| key and |VOL–| key on the remote control.
   Adjustment value:2.23V
   Standard value:2.22 to 2.235V

<div align="center">

MAIN BOARD (SIDE B)

</div>
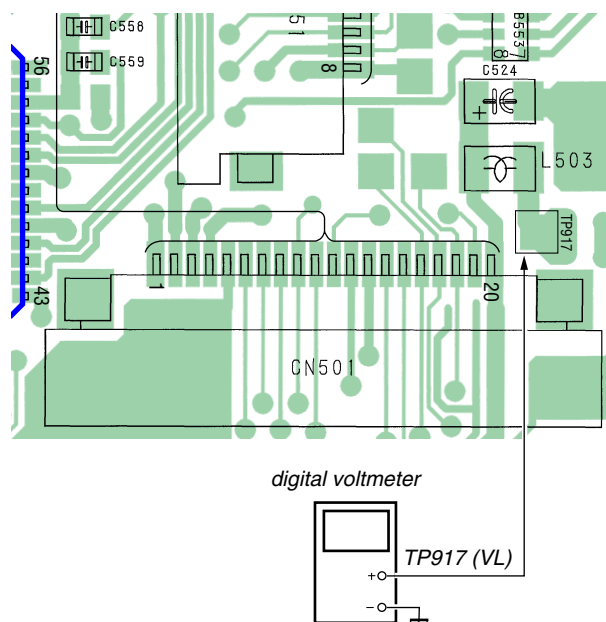
3. Press |II| key to write the adjustment value.
   The adjustment completion display appears as follows.

   LCD display

   ```
   000 ADJ OK
   ```

5-4-5.Electrical offset adjustment method

Note: Doing adjustment by the state that a disc does not enter.

1. Confirm the power voltage is 1.5V.
2. Set to the test mode.
3. Press the |VOL–| key activates the overall adjustment mode.
   LCD display

   ```
   000 Assy11   ⬭
   ```
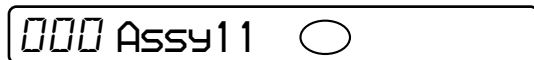
4. Press the |DISPLAY| key.
   LCD display

   ```
   030 Ofst**  ☢
   ```
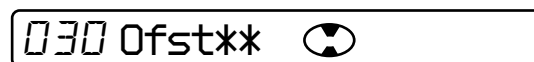
5. If result of electrical offset adjustment is OK,the following display appears.
   LCD display

   ```
   030 OfstOK  ☢
   ```
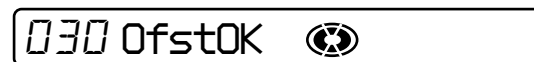
5-5. OVERALL ADJUSTMENT MODE

5-5-1. Overall adjustment mode structure
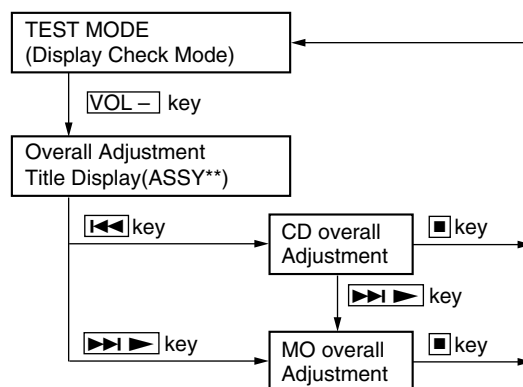
Note: The overall adjustments should be always performed in the sequence of CD → MO adjustments.

5-5-2. Overall CD and MO adjustment method

1. Set the TEST MODE and press |VOL–| key to set the Overall Adjustment mode.

   LCD display

   ```
   000 Assy11   ✴
   ```
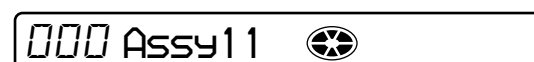
2. Insert CD disc in the set, and press |◄◄| key to set the Overall CD Adjustment mode.
   Automatic adjustments are made.

   LCD display

   ```
   XXX CD RUN
   ```
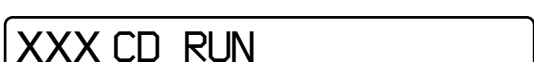
   XXX: Item No. for which an adjustment is being executed.

3. If NG in the overall CD adjustments, return to Reset NV and perform from the electrical offset adjustment again.

LCD display

```
☐☐☐ XXX NG
```

XXX: NG item No.

4. If OK through the overall CD adjustments, then perform overall MO adjustments.

LCD display

```
XXX CD OK
```

5. Insert MO disc in the set, and press ▶▶▌ ▶ key to set the Overall MO Adjustment mode. Automatic adjustments are made.

LCD display

```
XXX MO RUN
```

XXX: Item No. for which an adjustment is being executed.

6. If NG in the overall MO adjustments, return to Reset NV and perform the adjustment again.

LCD display

```
☐☐☐ XXX NG
```

XXX: NG item No.

7. If OK through the overall MO adjustments, press ■ key to return to the TEST MODE and terminate the Overall Adjustment mode.

LCD display

```
☐☐☐ MO OK
```

5-5-3. Resume clear method
1. Setting the test mode.
2. Set the Manual mode and set the item No.043(RESUME Clear).
LCD display

```
☐43 Resume CC
```

3. Press the ▐▐ key.
LCD display

```
☐43 Res ✱✱✱
```

After reset is completed

LCD display

```
☐43 Res Clr
```

5-5-4. Overall CD and MO adjustment items
1. Overall offset adjustment

Item No.	Contents
030	GRV setting • Sarvo OFF • Head UP
035	Laser ON/OFF electrical offset difference measurement
Completed	

2. Overall CD adjustment items

Item No.	Contents
761	VC,VR power voltage High/Low selection
300	HPIT setting • Sarvo OFF
561	SLED move to inside
562	SLED move to outside
High reflection CD electrical offset adjustment	
312	Laser ON • Focus UP • VC correction ALFA offset adjustment
313	IJ offset adjustment
314	FE offset adjustment
HPIT adjustment	
320	Focus servo ON
324	TE offset adjustment 1
321	TE gain adjustment
328	TWPP gain adjustment
324	TE offset adjustment 1
332	TE offset adjustment 2
330	Tracking servo ON
336	ABCD gain adjustment
337	KF gain correction
338	RF gain adjustment
344	FCS gain adjustment
345	TRK gain adjustment
521	Two-axis sensitivity adjustment (inside)
522	Two-axis sensitivity adjustment (outside)
341	Focus bias adjustment
300	HPIT setting • servo OFF
Completed	

3. Overall MO adjustment items

Item No.	Contents
761	VC,VR power voltage High/Low selection
100	G RV setting
Low reflect MO offset adjustment	
112	Laser ON • Focus UP • VC correction ALFA offset adjustment
113	IJ offset adjustment
114	FE offset adjustment
118	Wpp denominator adjustment
HPIT adjustmet	
200	LPIT setting • servo OFF
561	SLED move to inside
220	Focus servo ON
224	TE offset adjustment 1
221	TE gain adjustment
224	TE offset adjustment 1
232	TE offset adjustment 2

Item No.	Contents
230	Tracking servo ON
236	ABCD gain adjustment
237	KF gain adjustment
238	RF gain adjustment
244	FCS gain adjustment
245	TRK gain adjustment
	READ GRV adjustment 1
100	R GRV setting • servo OFF
562	SLED move to outside
120	Focus servo OFF
122	TON offset adjustment
121	TE gain adjustment
122	TON offset adjustment
123	TEIN offset adjustment
124	TWPP offset adjustment
130	Tracking servo ON
131	TWPP offset adjustment
136	ABCD gain adjustment
137	KF gain adjustment
139	ADIP BPF fo adjustment
144	FCS gain adjustment
145	TRK gain adjustment
134	TWPP gain adjustment
131	TWPP offset adjustment 1
132	TWPP offset adjustment 2
149	TWPP OP offset adjustment
138	RF gain adjustment
100	R GRV setting • Servo OFF

SECTION 6
DIAGRAMS

Note on Printed Wiring Boards: MAIN SECTION

- o— : parts extracted from the component side.
- ▮▮▮ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

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

- * Replacement of IC601 used in this set requires a special tool.

- Lead Layouts

surface

Lead layout of
conventional IC

CSP (chip size package)
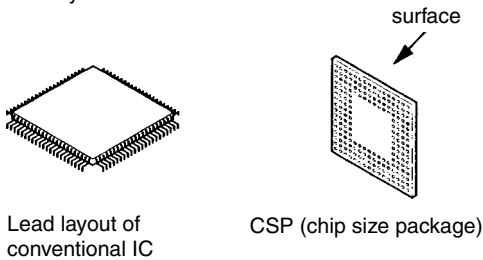
Note on Schematic Diagram: MAIN SECTION

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}$ W or less unless otherwise specified.
- △ : internal component.

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

- ▬▬ : B+ Line.
- Power voltage is dc 1.5V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PLAY
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : Analog
  ⇉ : Digital

- * Replacement of IC601 used in this set requires a special tool.
- The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different from that of conventional IC.

● WAVEFORMS

①

Approx.
12 mVp-p

IC501 ① TE

VOLT/DIV : 5 mV AC
TIME/DIV : 1 μsec

②

Approx.
1.2 Vp-p

IC501 ㉝ (RF)

VOLT/DIV : 0.5 V AC
TIME/DIV : 0.5 μsec

③

Approx.
10 mVp-p

IC501 ㊷ (FE)

VOLT/DIV : 5 mV AC
TIME/DIV : 1 μsec

6-1. BLOCK DIAGRAM

• Signal path

⟹ : Digital

⟹ : Analog

• RCH is omitted

MZ-E500

【MAIN BOARD】(SIDE A)
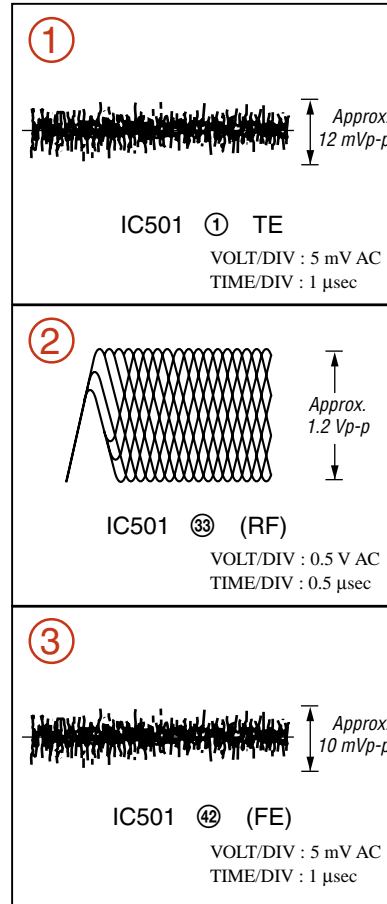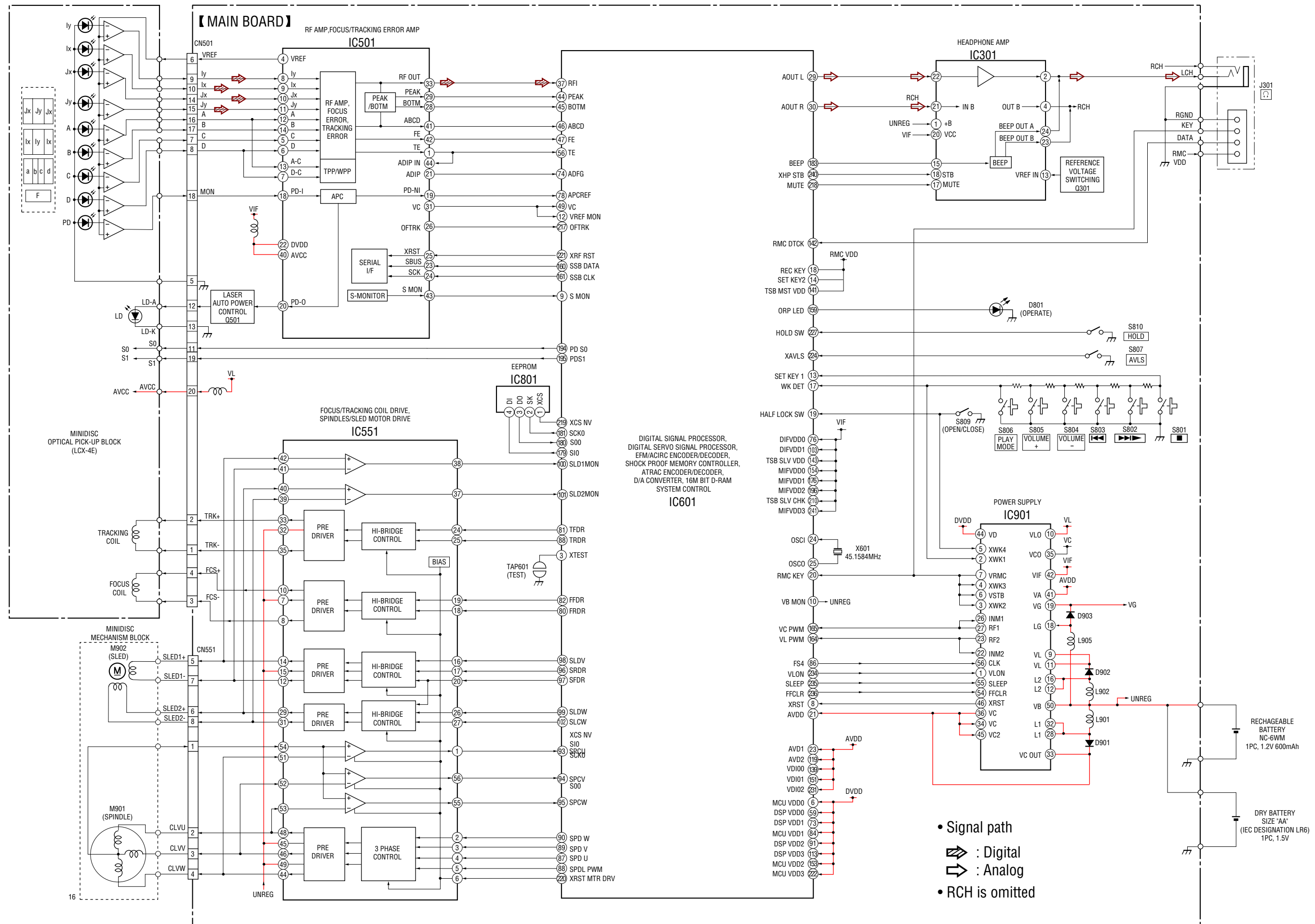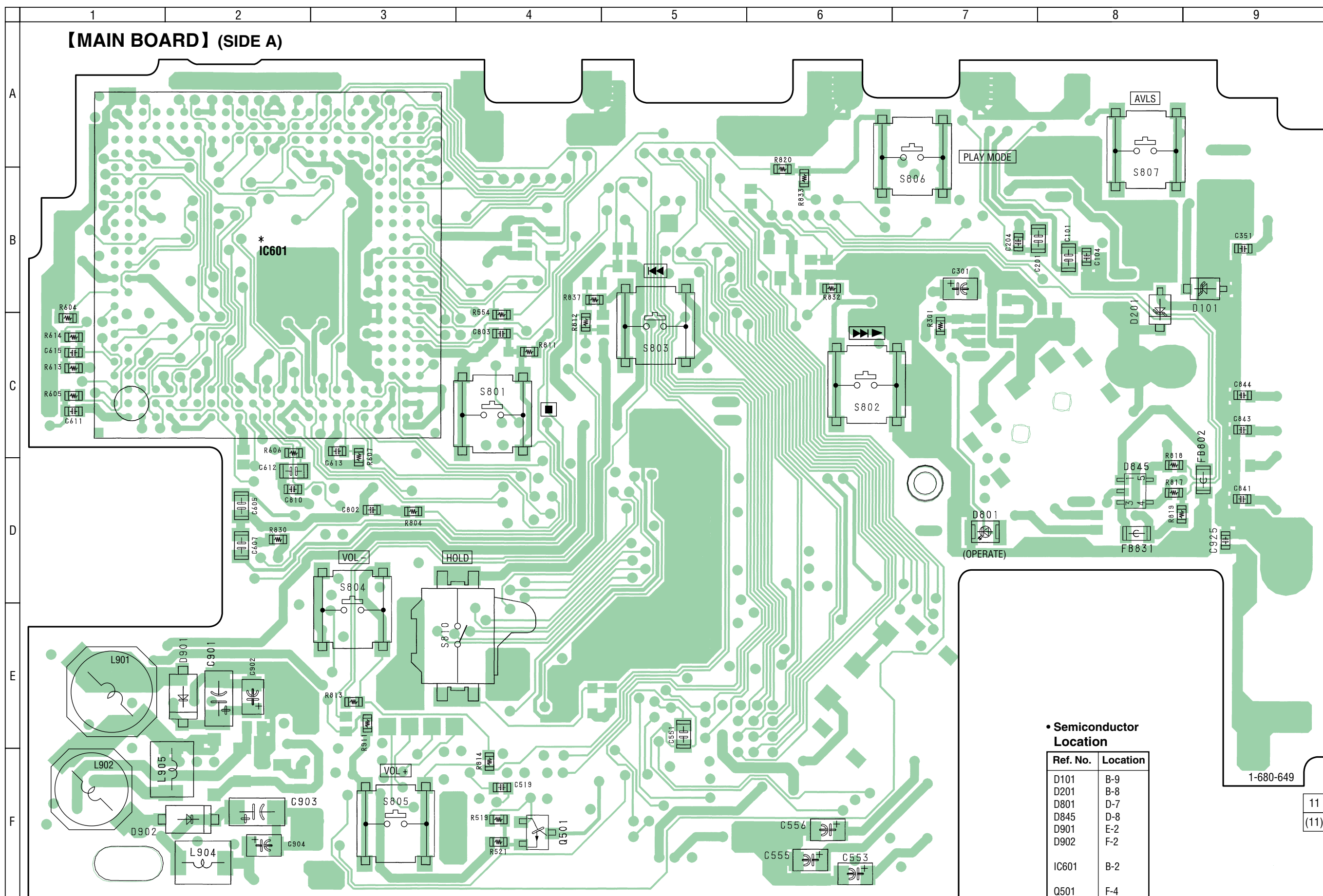
* IC601

* Semiconductor Location

Ref. No.	Location
D101	B-9
D201	B-8
D801	D-7
D845	D-8
D901	E-2
D902	F-2
IC601	B-2
Q501	F-4

1-680-649

11
(11)

* Replacement of IC601 used in this set requires a special tool.

— 19 —

— 20 —

6-3. PRINTED WIRING BOARDS – MAIN SECTION (2/2) – • Refer to page 16 for Note on Printed Wiring Board.

【MAIN BOARD】(SIDE B)

J301

S809
(OPEN/CLOSE)

TO
MOTOR FLEXIBLE BOARD
(M901 : SPINDLE MOTOR)
(M902 : SLED MOTOR)

OPTICAL
PICK-UP
BLOCK
LCX-4E

IC301

Q301

IC551

IC501

IC901

CN501

CN551

• Semiconductor Location

Ref. No.	Location
D903	E-9
IC301	B-3
IC501	E-6
IC551	E-5
IC801	B-8
IC901	E-8
Q301	B-4

1-680-649

11
(11)

— 21 —   — 22 —

MZ-E500
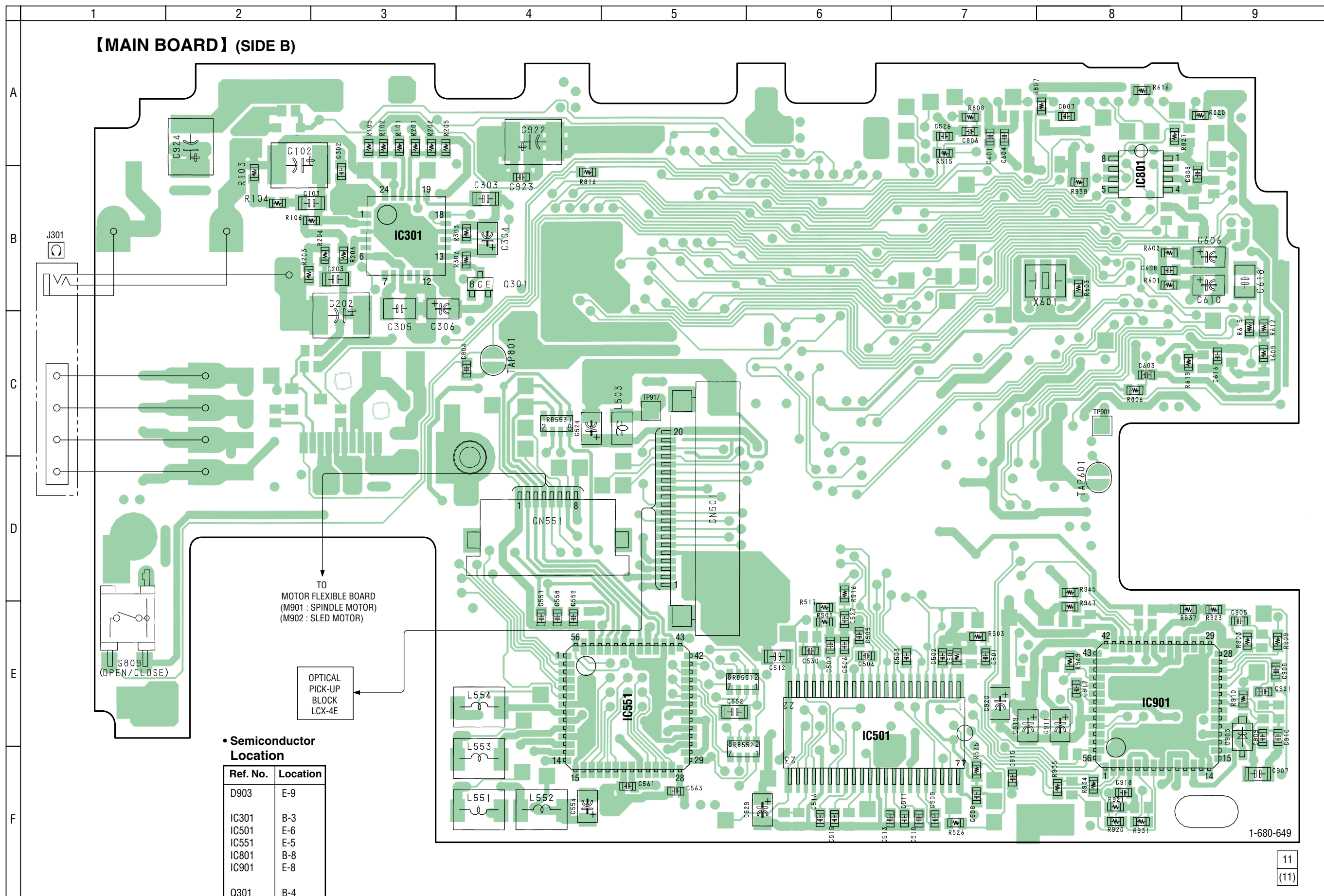
•Refer to page 16 for Note on Schematic Diagrams.
• Refer to page 16 for Waveforms.   • Refer to page 31 for IC Pin Function.

【MAIN BOARD】(1/3)

IC501
RF AMP, FOCUS/TRACKING
ERROR AMP

OPTICAL
PICK-UP
BLOCK
LCX-4E

SHORT:TEST MODE
OPEN:NORMAL MODE

* IC601
CXD2671-203GA

IC601
DIGITAL SIGNAL PROCESSOR,
DIGITAL SERVO SIGNAL PROCESSOR,
EFM/ACIRC ENCODER/DECODER,
SHOCK PROOF MEMORY CONTROLLER,
ATRAC ENCODER/DECODER,
D/A CONVERTER 16M BIT D-RAM
SYSTEM CONTROL

CSP (Chip Size Package)

IC801
AK6480BH-E2
EEPROM

MAIN BOARD (2/3)

MAIN BOARD (3/3)

* Replacement of IC601 used in this set
requires a special tool.

— 23 —

— 24 —
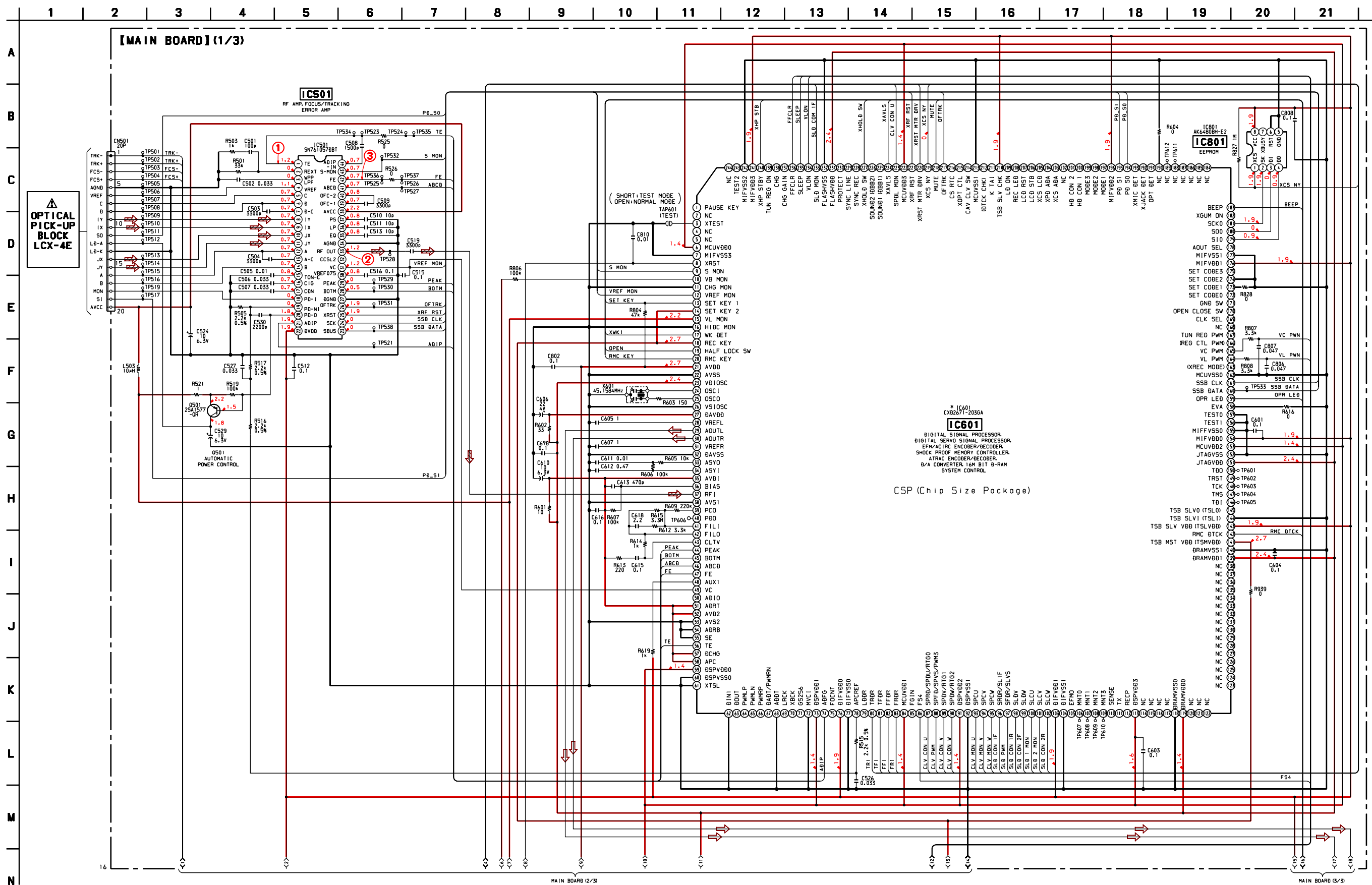
6-5. SCHEMATIC DIAGRAM – MAIN SECTION (2/3) – • Refer to page 16 Note on Schematic Diagrams. • Refer to page 29 for IC Block Diagrams.

【MAIN BOARD】(2/3)

MZ-E500

【MAIN BOARD】(3/3)

IC301
TA2131FL
IC301
HEADPHONE AMP
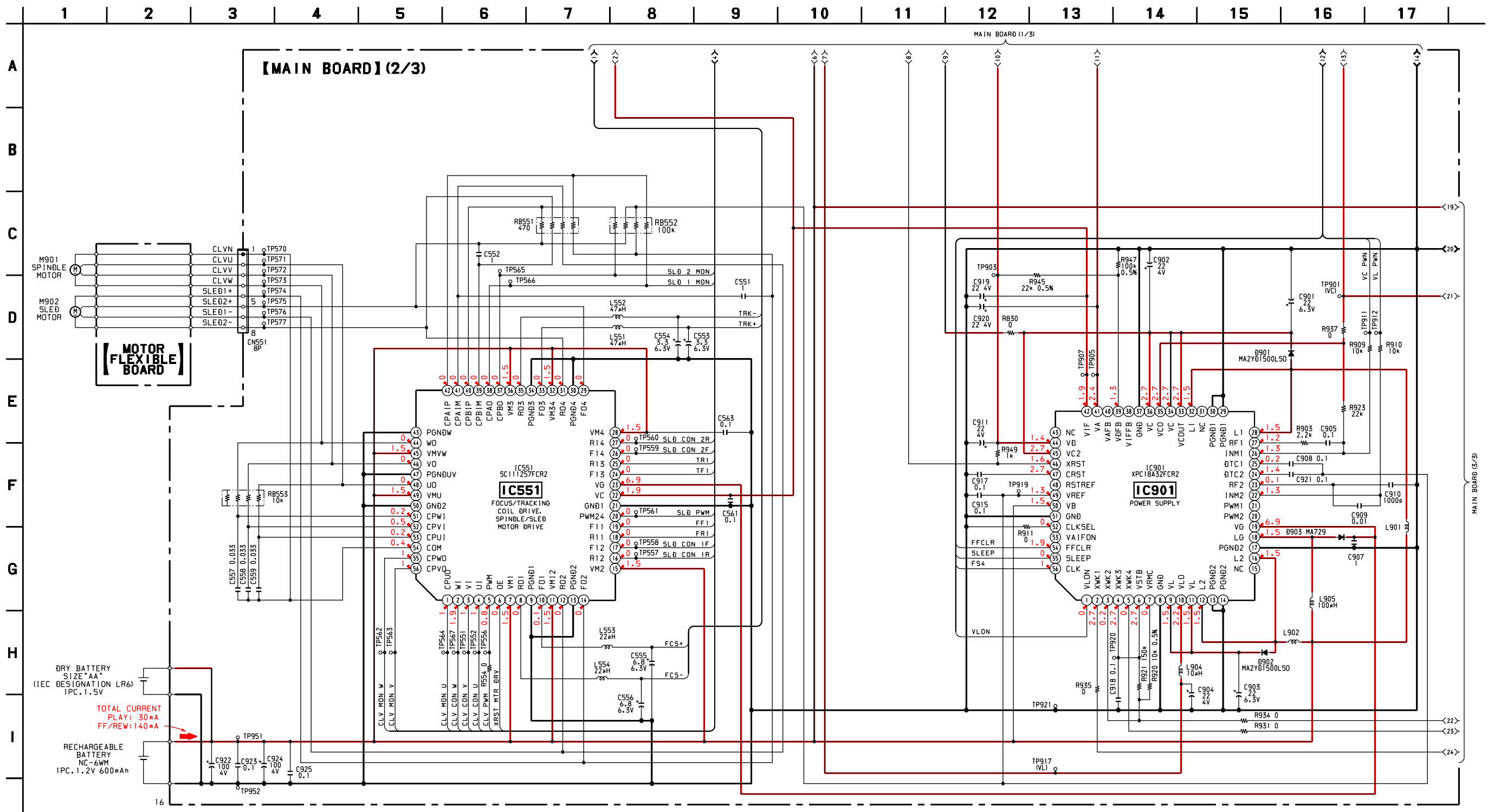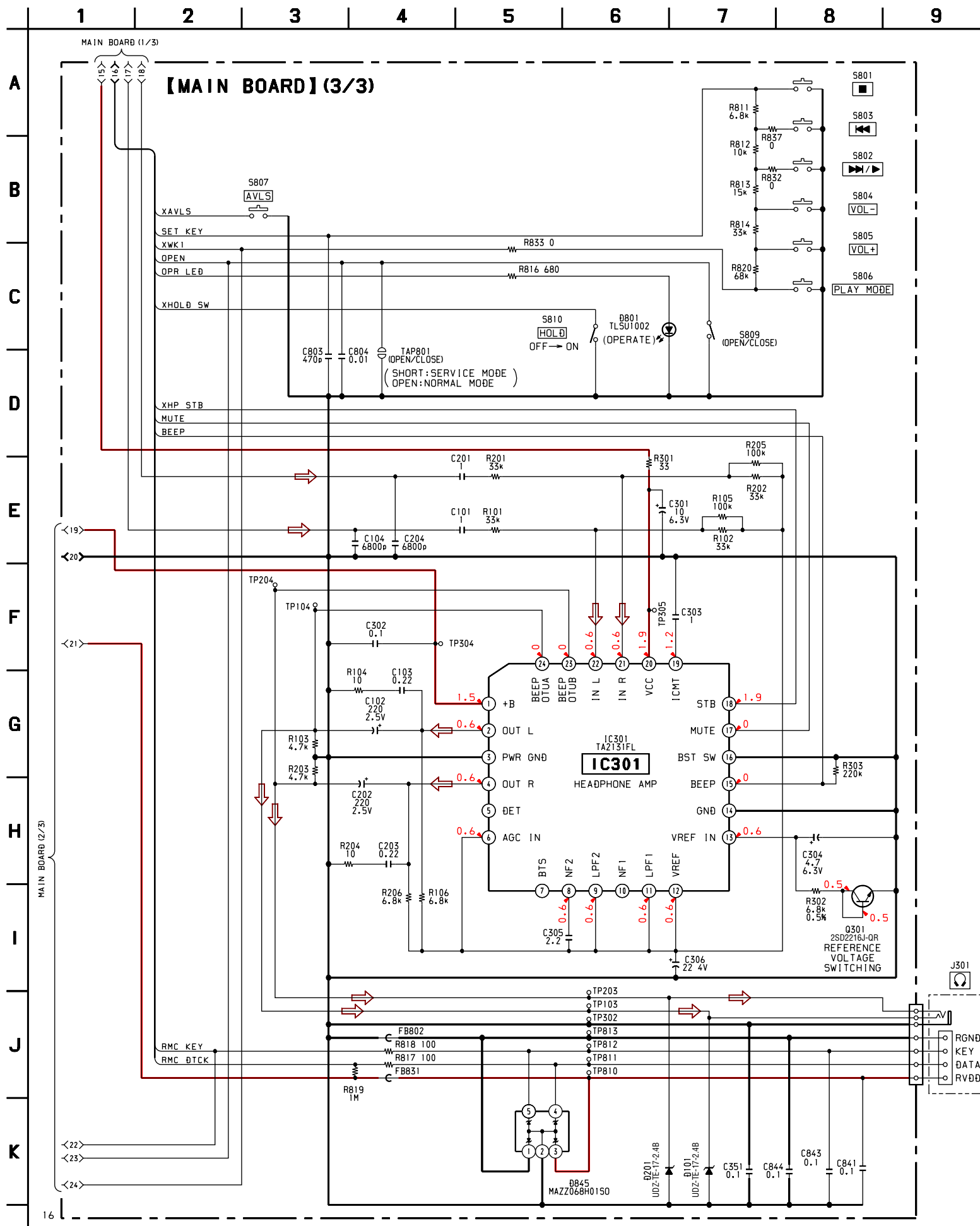
6-7. IC BLOCK DIAGRAMS
IC301 TA2131FL-(EL)
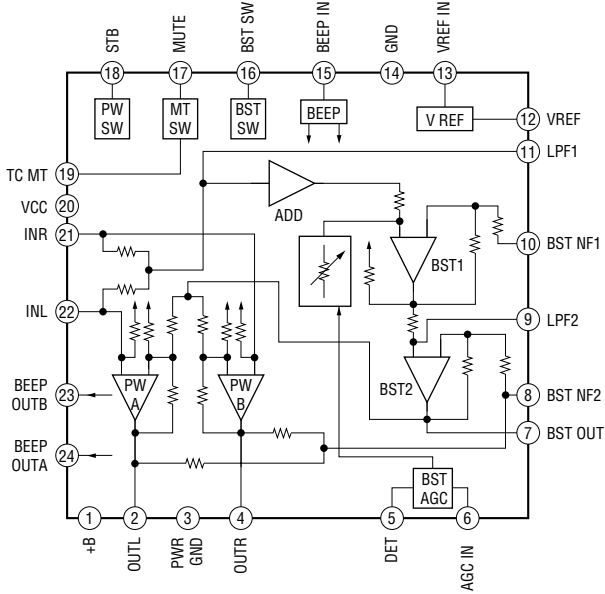
IC551 SC111257FCR2
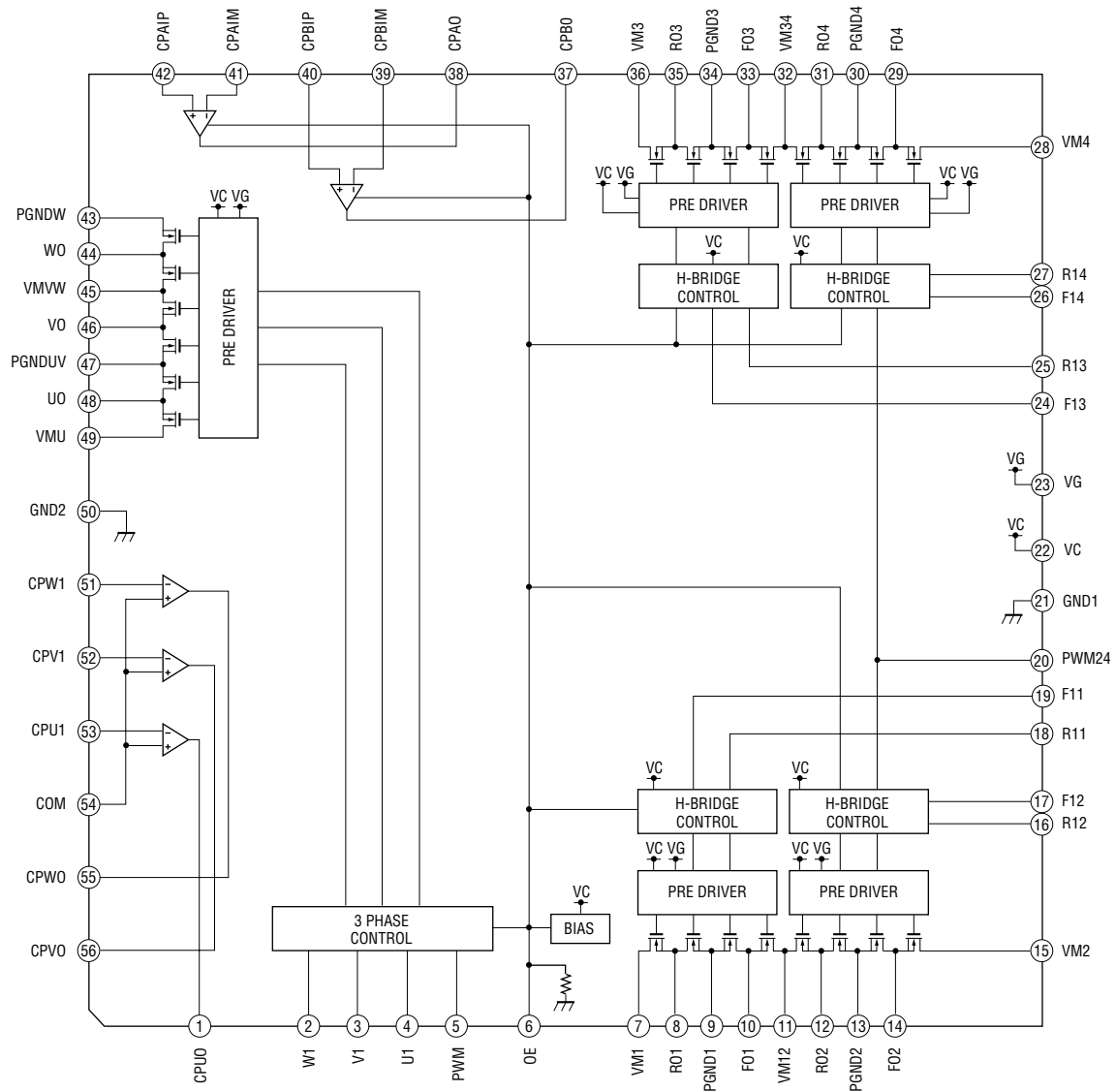
IC901 XPC18A32FCR2
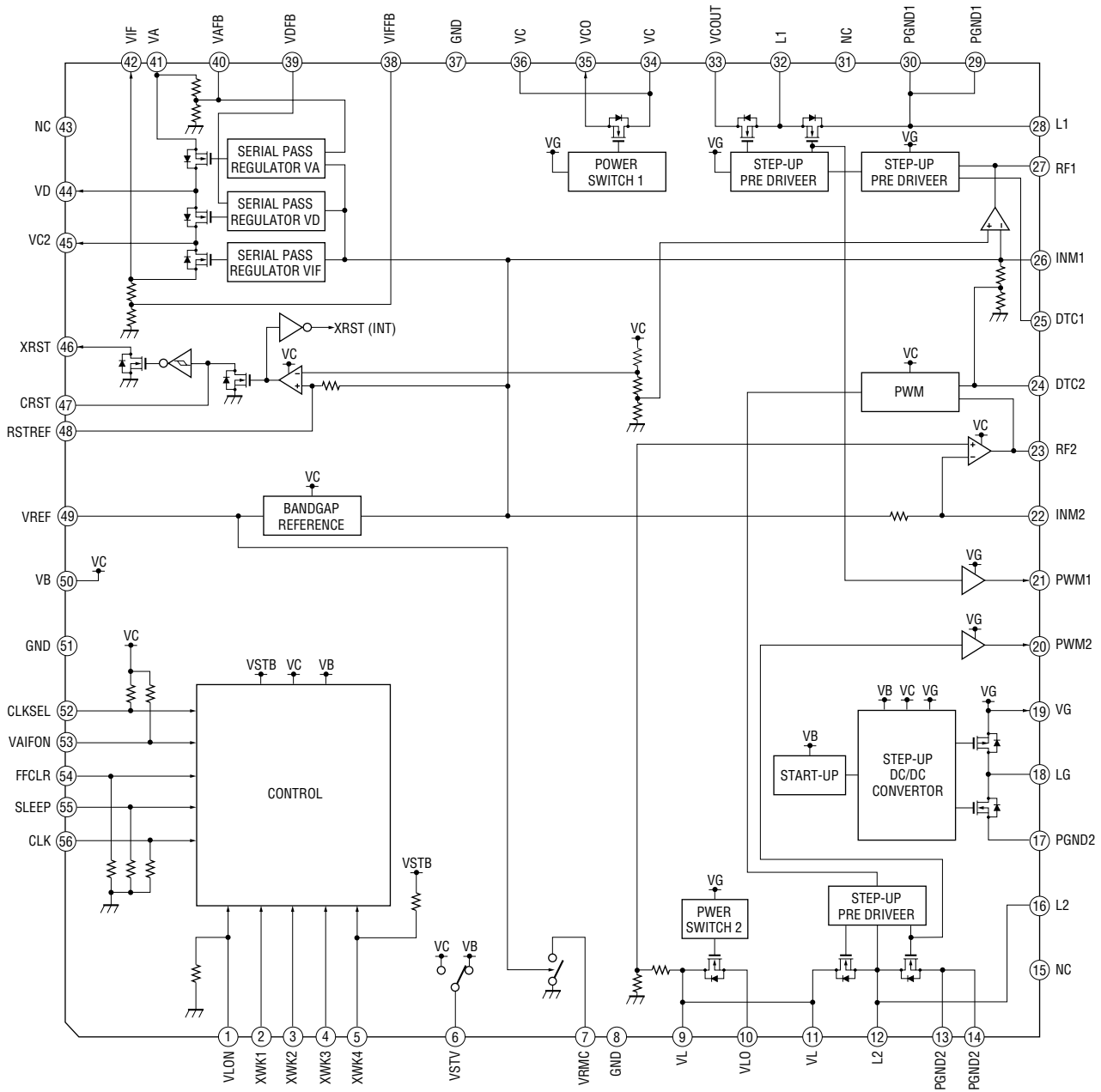
6-8. IC PIN FUNCTION DESCRIPTION

• IC501   SN761057DBT (RF AMP, FOCUS/TRACKING ERROR AMP)

Pin No.	Pin Name	I/O	Description
1	TE	O	Tracking error signal output to the system controller (IC601)
2	REXT	I	Connect terminal to the external resistor for ADIP amp control
3	WPPLPF	I	Connect terminal to the external capacitor for TPP/WPP low-pass filter
4	VREF	O	Reference voltage output terminal (+1.1V)
5	C	I	Signal (C) input from the optical pickup detector
6	D	I	Signal (D) input from the optical pickup detector
7	D-C	I	Signal (D) input from the optical pickup detector (AC input)
8	IY	I	I-V converted RF signal (IY) input from the optical pickup detector
9	IX	I	I-V converted RF signal (IX) input from the optical pickup detector
10	JX	I	I-V converted RF signal (JX) input from the optical pickup detector
11	JY	I	I-V converted RF signal (JY) input from the optical pickup detector
12	A	I	Signal (A) input from the optical pickup detector
13	A-C	I	Signal (A) input from the optical pickup detector (AC input)
14	B	I	Signal (B) input from the optical pickup detector
15	TON-C	I	Connect terminal to the external capacitor for TON hold
16	CIG	I	Connect terminal to the external capacitor for the low-pass filter of NPP divider denominator
17	CDN	I	Connect terminal to the external capacitor for the low-pass filter of CSL divider denominator
18	PD-I	I	Light amount monitor input terminal (invert input)
19	PD-NI	I	Light amount monitor input terminal (non-invert input)
20	PD-O	O	Light amount monitor output terminal
21	ADIP	O	ADIP duplex FM signal (66.15kHz ± 3kHz) output to the system controller (IC601)
22	DVDD	I	Power supply terminal (+1.9V) (digital system)
23	SBUS	I/O	SSB serial data input/output with the system controller (IC601)
24	SCK	I	SSB serial clock signal input from the system controller (IC601)
25	XRST	I	Reset signal input from the system controller (IC601) "L": reset
26	OFTRK	I	Off track signal input from the system controller (IC601)
27	DGND	I	Ground terminal (digital system)
28	BOTM	O	Bottom hold signal output of the light amount signal (RF/ABCD) to the system controller (IC 601)
29	PEAK	O	Peak hold signal output of the light amount signal (RF/ABCD) to the system controller (IC 601)
30	VREF	I	Connect terminal to the external capacitor for the internal reference voltage
31	VC	O	Middle point voltage (+1.2V) generation output terminal
32	CCSL2	I	Connect terminal to the external capacitor for TPP/WPP low-pass filter (not used in this set)
33	RF OUT	O	Playback EFM RF signal output to the system controller (IC601)
34	AGND	I	Ground terminal (analog system)
35~37	EQ, LP, PS	I	Connect terminal to the external capacitor for the RF equalizer
38	AVCC	I	Power supply terminal (analog system) (+2.2V)
39, 40	OFC2, OFC-1	I	Connect terminal to the external capacitor for RF AC coupling
41	ABCD	O	Light amount signal (ABCD) output to the system controller (IC601)
42	FE	O	Focus error signal output to the system controller (IC601)
43	S-MON	O	Servo signal monitor output to the system controller (IC601)
44	ADIP-IN	I	ADIP duplex FM signal (66.15kHz ± 3kHz) input terminal, 3 times speed

• IC601   CXD2671-203GA (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Description
1	PAUSE KEY	I	Not used (open)
2	NC	—	Not used (open)
3	XTEST	I	Input terminal for the test mode detection
4, 5	NC	—	Not used (open)
6	MCUVDD0	—	Power supply (for microcomputer block)
7	MIFVSS3	—	Ground (for microcomputer I/F)
8	XRST	I	System reset terminal
9	S MON	I	Servo signal monitor
10	VB MON	I	Voltage monitor of UNREG power supply
11	CHG MON	I	Not used (connected to ground)
12	VREF MON	I	Clear reference voltage monitor
13	SET KEY 1	I	Set key detection 1
14	SET KEY 2	I	Not used (connected to RMC VDD)
15	VL MON	I	VL voltage monitor
16	HIDC MON	I	Not used (connected to ground)
17	WK DET	I	Set KEY WAKE detection
18	REC KEY	I	Not used (connected to RMC VDD)
19	HALF LOCK SW	I	Signal input for OPEN SW detection
20	RMC KEY	I	Remote control key detection
21	AVDD	—	Power supply (for the analog circuit block)
22	AVSS	—	Ground (for the analog circuit block)
23	VDIOSC	—	Power supply (for OSC cell)
24	OSCI	I	Input to the X'tal oscillator circuit
25	OSCO	O	Output from the X'tal oscillator circuit
26	VSIOSC	—	Ground (for OSC cell)
27	DAVDD	—	Built-in DAC VCC
28	VREFL	—	Built-in DAC VREF (L-ch)
29	AOUTL	O	Built-in DAC (L-ch) output
30	AOUTR	O	Built-in DAC (R-ch) output
31	VREFR	I	Built-in DAC VREF (R-ch)
32	DAVSS	—	Ground (for the built-in DAC)
33	ASYO	O	Playback EFM duplex signal output
34	ASYI	I	Playback EFM comparison slice level input
35	AVD1	—	AVDD
36	BIAS	I	Bias input for the playback EFM comparison
37	RFI	I	Playback EFM RF signal input
38	AVS1	—	AVSS
39	PCO	O	Phase comparison output for the playback EFM system master PLL
40	PDO	O	Phase comparison output for the analog PLL
41	FILI	I	Filter input for the playback EFM system master PLL
42	FILO	O	Filter output for the playback EFM system master PLL
43	CLTV	I	Internal VCO control voltage input for the playback EFM system master PLL
44	PEAK	I	Peak hold signal input of the light amount signal
45	BOTM	I	Bottom hold signal input of the light amount signal
46	ABCD	I	Light amount signal input

Pin No.	Pin Name	I/O	Description
47	FE	I	Focus error signal input
48	AUX1	I	Support signal input (A/D input)
49	VC	I	Middle point voltage input
50	ADIO	O	Not used (open)
51	ADRT	I	A/D converter the upper limit voltage input
52	AVD2	—	AVDD
53	AVS2	—	AVSS
54	ADRB	I	A/D converter the lower limit voltage input
55	SE	I	Sled error signal input
56	TE	I	Tracking error signal input
57	DCHG	—	Connecting analog power supply of the low impedance
58	APC	I	Error signal input for the laser digital APC
59	DSPVDD0	—	Power supply (for DSP block)
60	DSPVSS0	—	Ground (for DSP block)
61	XTSL	I	X'tal oscillation frequency selection
62	DIN1	I	Not used (connected to ground)
63	DOUT	O	Not used (open)
64	PWMLP	O	Not used (open)
65	PWMLN	O	Not used (open)
66	PWMRP	O	Not used (open)
67	DADT/PWRRN	O	Not used (open)
68	ADDT	I	Not used (connected to ground)
69	LRCK	O	Not used (open)
70	XBCK	O	Not used (open)
71	FS256	O	Not used (open)
72	MVCI	I	Not used (connected to ground)
73	DSPVDD1	—	Power supply (for DSP block)
74	ADFG	I	ADIP duplex FM signal (20.05±1KHz) input
75	F0CNT	O	Not used (open)
76	DIFVDD0	—	Power supply (for DSP I/F)
77	DIFVSS0	—	Ground (for DSP I/F)
78	APCREF	O	Output to the reference PWM for the laser APC
79	LDDR	O	Not used (open)
80	TRDR	O	Tracking servo drive PWM signal output (–)
81	TFDR	O	Tracking servo drive PWM signal output (+)
82	FFDR	O	Focus servo drive PWM signal output (–)
83	FRDR	O	Focus servo drive PWM signal output (+)
84	MCUVDD1	—	Power supply (for the microcomputer block)
85	FGIN	I	Not used (open)
86	FS4	O	176.4kHz clock signal output
87	SPRD/SPDU/RTG0	O	Spindle servo drive output (PWM– or inertia)/Brushless spindle motor 3-phase drive logic output (U)/RTG output 0
88	SPFD/SPVS/PWM3	O	Spindle servo drive output (PWM+ or PWM absolute value)/Brushless spindle motor absolute value PWM output/PWM3
89	SPDV/RTG1	O	Brushless spindle motor 3-phase drive logic output (V)/RTG output 1
90	SPDW/RTG2	O	Brushless spindle motor 3-phase drive logic output (W)/RTG output 2

Pin No.	Pin Name	I/O	Description
91	DSPVDD2	—	Power supply (for DSP block)
92	DSPVSS1	—	Ground (for DSP block)
93	SPCU	I	Brushless spindle motor drive comparison signal input (U)
94	SPCV	I	Brushless spindle motor drive comparison signal input (V)
95	SPCW	I	Brushless spindle motor drive comparison signal input (W)
96	SRDR/SL1F	O	Sled servo drive PWM signal output (–)
97	SFDR/SLVF	O	Sled servo drive PWM signal output (+)
98	SLDV	O	Brushless sled motor 3-phase logic output (V)/2-phase drive logic output (1–)
99	SLDW	O	Brushless sled motor 3-phase drive logic output (W)/2-phase drive logic output (2+)
100	SLCU	I	Brushless sled motor 3-phase drive comparate input (U)/2-phase drive comparate input (1)
101	SLCV	I	Brushless sled motor 3-phase drive comparate input (V)/2-phase drive comparate input (2)
102	SLCW	I	Brushless sled motor 3-phase drive comparate input (W)/2-phase comparate output (2–)
103	DIFVDD1	—	Power supply (for DSP I/F)
104	DIFVSS1	—	Ground (for DSP I/F)
105	EFMO	O	Not used (open)
106	MNT0	O	DSP monitor output (0)
107	MNT1	O	DSP monitor output (1)
108	MNT2	O	DSP monitor output (2)
109	MNT3	O	DSP monitor output (3)
110	SENSE	O	Not used (open)
111	TX	O	Not used (open)
112	RECP	O	Not used (open)
113	DSPVDD3	—	Power supply (for DSP block)
114 to 117	NC	—	Not used (open)
118	DRAMVSS0	—	Ground (for the external D-RAM)
119	DRAMVDD0	—	Power supply (for the external D-RAM)
120 to 138	NC	—	Not used (open)
139	DRAMVDD1	—	Power supply (for the external D-RAM)
140	DRAMVSS1	—	Ground (for the external D-RAM)
141	TSB MST VDD	—	Power supply (for TSB master communication)
142	RMC DTCK	I/O	TSB master data input/output
143	TSB SLV VDD	—	I/F power supply (for TSB slave communication)
144	TSB SLVI	I	TSB slave signal input
145	TSB SLVO	O	Not used (open)
146	TDI	I	Data input terminal for JTAG
147	TMS	I	Test mode control input terminal for JTAG
148	TCK	I	Clock input terminal for JTAG
149	XTRST	I	Reset input terminal for JTAG
150	TDO	O	Data output terminal for JTAG
151	JTAGVDD	—	Power supply terminal for JTAG
152	JTAGVSS	—	Ground terminal for JTAG
153	MCUVDD2	—	Power supply (for the microcomputer block)
154	MIFVDD0	—	Power supply (for the microcomputer I/F block)
155	MIFVSS0	—	Ground (for the microcomputer I/F block)

Pin No.	Pin Name	I/O	Description
156, 157	TEST1, TEST0	I	Terminal 1, 0 for the main test
158	EVA	I	EVA/FLASH chip discrimination terminal
159	OPR LED	O	Operation LED control
160	SSB DATA	I/O	Input/output of SSB serial data
161	SSB CLK	—	SSB serial clock
162	MCUVSS0	—	Ground (for the microcomputer block)
163	VREC MODE	O	Not used (open)
164	VL PWM	—	PWM for the laser power supply voltage control
165	VC PWM	—	PWM for the system power supply voltage control
166	REG CTL PWM	O	Not used (open)
167	TUN REG PWM	O	Not used (open)
168	NC	O	Not used (open)
169	CLK SEL	O	Not used (open)
170	OPEN CLOSE SW	I	Not used (open)
171	GND SW	O	Not used (open)
172	SET CODE0	—	Not used (open)
173	SET CODE1	O	Set code 1
174	SET CODE2	O	Set code 2
175	SET CODE3	—	Not used (open)
176	MIFVDD1	—	Power supply (for the microcomputer I/F block)
177	MIFVSS1	—	Ground (for the microcomputer I/F block)
178	AOUT SEL	O	HP/LINE changeover signal output Not used (open)
179	SI0	I	Serial data input (CH0)
180	SO0	O	Serial data output (CH0)
181	SCK0	O	Serial clock signal output (CH0)
182	XGUM ON	I	Not used (open)
183	BEEP	O	Beep sound output
184 to 190	NC	—	Not used (open)
191	OPT DET	I	Not used (open)
192	XJACK DET	I	Not used (open)
193	XMIC DET	I	Not used (open)
194, 195	PD S0, PD S1	O	PD IC mode changeover 0, 1
196	MIFVDD2	—	Power supply (for the microcomputer I/F block)
197 to 199	MODE1 to 3	O	Not used (open)
200, 201	HD CON 1, 2	O	Not used (open)
202	NC	O	Not used (open)
203	XCS ADA	O	Not used (open)
204	XPD ADA	O	Not used (open)
205	XCS LCD	O	Not used (open)
206	LCD STB	O	Not used (open)
207	LCD RST	O	Not used (open)
208	REC LED	O	Not used (open)
209	LD ON	O	Not used (open)

Pin No.	Pin Name	I/O	Description
210	TSB SLV CHK	I	TSB slave check
211	K-TAI	I	Not used (open)
212	DTCK CHK	I	Not used (open)
213	MCUVSS1	—	Ground (for the microcomputer block)
214	CAV CLV SW	O	Not used (open)
215	XOPT CTL	O	Not used (open)
216	CS RTC	O	Not used (open)
217	OFTRK	I	Off track signal input
218	MUTE	O	Analog mute "H": muting ON
219	XCS NV	O	NV RAM chip select
220	XRST MTR DRV	O	NADESHIKO2 reset
221	XRF RST	O	TIARA reset
222	MCUVDD3	—	Power supply (for the microcomputer block)
223	SPDL MON	I	Spindle monitor
224	XA VLS	I	AVLS SW detection
225, 226	SOUND 1, 2	I	Not used (open)
227	XHOLD SW	I	HOLD switch detection
228	SYNC REC	I	Not used (open)
229	SYNC LINE	O	Not used (open)
230	PROTECT	I	Not used (open)
231	FLASHVDD	—	Power supply for FLASH
232	FLASHVSS	—	Ground terminal for FLASH
233	SLD MON	I	Sled monitor
234	VLON	O	Laser power supply control
235	SLEEP	O	SLEEP request
236	FFCLR	O	Input latch output for the start signal
237	CHG GAIN	O	Not used (open)
238	CHG	O	Not used (open)
239	TUN REG ON	O	Not used (open)
240	XHP STBY 0	O	HP Amp power supply control
241	MIFVDD3	—	Power supply (for the microcomputer I/F block)
242	MIFVSS2	—	Ground (for the microcomputer I/F block)
243	TEST2	O	Not used (open)
244	NC	—	Not used (open)

NOTE :
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ••• (RED)
          ↑   ↑
      Parts color Cabinet's color
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  AUS   : Australian model.
  FR   : French model.
  HK   : Hong Kong model.
  KR   : Korea model.

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

7-1. MAIN SECTION

MT-MZE500-174

Ref. No.	Part No.	Description	Remarks
1	4-218-233-09	SCREW (1.4), MI (SILVER)...(SILVER, YELLOW, BLUE)	
1	4-218-233-11	SCREW (1.4), MI (BLACK)...(BLACK)	
2	A-3380-151-1	PANEL SUB ASSY (OS), UPPER (SILVER)	
2	A-3380-152-1	PANEL SUB ASSY (OL), UPPER (BLUE) (AEP, E,HK)	
2	A-3380-153-1	PANEL SUB ASSY (OY), UPPER (YELLOW) (HK)	
2	A-3380-154-1	PANEL SUB ASSY (OB), UPPER (BLACK) (HK)	
3	X-3379-511-1	HOLDER ASSY	
4	4-225-426-01	SCREW (MD), STEP	
5	X-3379-686-1	BRACKET ASSY	
6	3-224-037-21	SPRING (POP UP L)	
7	4-984-017-21	SCREW (1.7), TAPPING	
8	3-226-938-01	SHEET, INSULATING	
9	4-225-074-01	TERMINAL BOARD	
10	3-224-036-21	SPRING (POP UP R)	
* 11	A-3323-629-A	MAIN BOARD, COMPLETE	
12	3-224-033-01	LID, BATTERY CASE (SILVER)	
12	3-224-033-11	LID, BATTERY CASE (BLUE)(AEP,E,HK)	
12	3-224-033-21	LID, BATTERY CASE (YELLOW)(HK)	
12	3-224-033-31	LID, BATTERY CASE (BLACK)(HK)	
13	X-3379-685-1	TERMINAL BOARD ASSY, BATTERY	
14	3-224-024-11	CASE (BATTERY)	
15	3-224-027-01	SLIDER (OPEN)	
16	3-225-834-01	SPRING (OPEN), TENSION	
17	3-224-026-01	LEVER (CONVERSION)	

Ref. No.	Part No.	Description	Remarks
18	4-995-271-01	SCREW (MD), STEP	
19	3-224-025-01	TERMINAL BOARD (MINUS)	
20	3-224-023-01	BUTTON (OPEN)	
21	3-224-022-01	BELT, ORNAMENTAL (WHITE)...(SILVER)	
21	3-224-022-11	BELT, ORNAMENTAL (DARK BLUE)...(BLUE)(AEP,E,HK)	
21	3-224-022-21	BELT, ORNAMENTAL (LIGHT GRAY)...(YELLOW)(HK)	
21	3-224-022-31	BELT, ORNAMENTAL (DARK GRAY)...(BLACK)(HK)	
22	3-224-020-01	BUTTON (CONTROL B)	
23	3-224-063-21	SPRING (HOLD)	
24	3-224-019-01	BUTTON (CONTROL A)	
25	3-224-018-51	CASE (REAR) (SILVER)	
25	3-224-018-61	CASE (REAR) (BLUE)(AEP,E,HK)	
25	3-224-018-71	CASE (REAR) (YELLOW)(HK)	
25	3-224-018-81	CASE (REAR) (BLACK)(HK)	
26	3-224-021-01	DIAL (HOLD) (LIGHT GRAY)...(SILVER,YELLOW)	
26	3-224-021-11	DIAL (HOLD) (LIGHT GRAY)...(BLUE)(AEP,E,HK)	
26	3-224-021-21	DIAL (HOLD) (DARK GRAY)...(BLACK)(HK)	
27	4-218-233-25	SCREW (1.4), MI (SILVER)...(SILVER, YELLOW, BLUE)	
27	4-218-233-27	SCREW (1.4), MI (BLACK)...(BLACK)	
28	3-227-291-01	SHEET (QON)	

7-2. MECHANISM DECK SECTION
(MT-MZE500-174)

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	1-680-453-11	MOTOR FLEXIBLE BOARD		61	4-222-203-02	SCREW, LEAD	
52	3-222-392-01	SCREW (M1.4), TAPPING		⚠62	X-3379-869-1	OPTICAL PICK-UP BLOCK (LCX-4E)	
53	3-222-394-01	CHASSIS		63	3-222-391-01	SPRING (M), RACK	
54	3-224-779-01	SPRING, THRUST DETENT		64	3-225-278-11	SCREW, TAPPING	
55	4-222-216-01	GEAR (SA)		65	X-3379-529-1	BASE ASSY, MOTOR	
				M901	8-835-706-01	MOTOR, DC SSM18A (SPINDLE)	
56	3-338-645-51	WASHER					
57	4-218-233-14	SCREW (1.4), MI		M902	1-763-399-11	MOTOR, DC (SLED)(WITH PULLY)	
58	4-218-233-02	SCREW (1.4), MI					
59	4-222-208-01	GEAR (SB)					
60	4-222-204-01	BEARING (N)					

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

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF

- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- Abbreviation
  AUS : Australian model.
  FR : French model.
  HK : Hong Kong model.
  KR : Korea model.

- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA... : μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

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

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

Ref. No.	Part No.	Description			Remarks
*	A-3323-629-A	MAIN BOARD, COMPLETE			
		********************			
	3-227-590-01	SHEET (F), CONDUCTIVE			
	4-225-074-01	TERMINAL BOARD			
		< CAPACITOR >			
C101	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C102	1-135-868-91	TANTAL. CHIP	220uF	20%	2.5V
C103	1-115-467-11	CERAMIC CHIP	0.22uF	10.00%	10V
C104	1-164-942-11	CERAMIC CHIP	0.0068uF	10.00%	16V
C201	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C202	1-135-868-91	TANTAL. CHIP	220uF	20%	2.5V
C203	1-115-467-11	CERAMIC CHIP	0.22uF	10.00%	10V
C204	1-164-942-11	CERAMIC CHIP	0.0068uF	10.00%	16V
C301	1-117-919-11	TANTAL. CHIP	10uF	20.00%	6.3V
C302	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C303	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C304	1-125-926-11	TANTAL. CHIP	4.7uF	20%	6.3V
C305	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C306	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C351	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C501	1-164-931-11	CERAMIC CHIP	100PF	10.00%	16V
C502	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C503	1-164-940-11	CERAMIC CHIP	0.0033uF	10.00%	16V
C504	1-164-940-11	CERAMIC CHIP	0.0033uF	10.00%	16V
C505	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C506	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C507	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C508	1-164-938-11	CERAMIC CHIP	0.0015uF	10.00%	16V
C509	1-164-940-11	CERAMIC CHIP	0.0033uF	10.00%	16V
C510	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C511	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C512	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C513	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C515	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C516	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C519	1-164-940-11	CERAMIC CHIP	0.0033uF	10.00%	16V
C524	1-117-919-11	TANTAL. CHIP	10uF	20.00%	6.3V
C526	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C527	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C529	1-117-919-11	TANTAL. CHIP	10uF	20.00%	6.3V
C530	1-164-939-11	CERAMIC CHIP	0.0022uF	10.00%	16V
C551	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C552	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C553	1-127-578-11	TANTAL. CHIP	3.3uF	20%	6.3V
C554	1-127-578-11	TANTAL. CHIP	3.3uF	20%	6.3V

Ref. No.	Part No.	Description			Remarks
C555	1-131-621-11	TANTAL. CHIP	6.8uF	20%	6.3V
C556	1-131-621-11	TANTAL. CHIP	6.8uF	20%	6.3V
C557	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C558	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C559	1-127-772-11	CERAMIC CHIP	33000PF	10%	10V
C561	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C563	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C601	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C603	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C604	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C605	1-115-156-11	CERAMIC CHIP	1uF		10V
C606	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C607	1-115-156-11	CERAMIC CHIP	1uF		10V
C610	1-117-919-11	TANTAL. CHIP	10uF	20.00%	6.3V
C611	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C612	1-117-863-11	CERAMIC CHIP	0.47uF	10.00%	6.3V
C613	1-164-935-11	CERAMIC CHIP	470PF	10.00%	16V
C615	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C616	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C618	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C698	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C802	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C803	1-164-935-11	CERAMIC CHIP	470PF	10.00%	16V
C804	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C806	1-119-923-11	CERAMIC CHIP	0.047uF	10.00%	10V
C807	1-119-923-11	CERAMIC CHIP	0.047uF	10.00%	10V
C808	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C810	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C841	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C843	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C844	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C901	1-137-739-11	TANTALUM	22uF	20%	6.3V
C902	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C903	1-137-739-11	TANTALUM	22uF	20%	6.3V
C904	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C905	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C907	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C908	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C909	1-164-943-11	CERAMIC CHIP	0.01uF	10.00%	16V
C910	1-164-937-11	CERAMIC CHIP	0.001uF	10.00%	16V
C911	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C915	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C917	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C918	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C919	1-127-895-11	TANTAL. CHIP	22uF	20%	4V

MAIN

Ref. No.	Part No.	Description			Remarks
C920	1-127-895-11	TANTAL. CHIP	22uF	20%	4V
C921	1-125-777-11	CERAMIC CHIP	0.1uF	10.00%	10V
C922	1-127-569-11	TANTAL. CHIP	100uF	20%	4V
C923	1-107-820-11	CERAMIC CHIP	0.1uF		16V
C924	1-127-569-11	TANTAL. CHIP	100uF	20%	4V
C925	1-107-820-11	CERAMIC CHIP	0.1uF		16V
		< CONNECTOR >			
* CN501	1-778-168-11	CONNECTOR, FFC/FPC (ZIF) 20P			
* CN551	1-793-124-21	CONNECTOR, FPC (ZIP) 8P			
		< DIODE >			
D101	8-719-056-72	DIODE UDZ-TE-17-2.4B			
D201	8-719-056-72	DIODE UDZ-TE-17-2.4B			
D801	8-719-061-82	LED TLSU1002(TPX1,SONY)(OPERATE)			
D845	8-719-077-43	DIODE MAZZ068H01S0			
D901	8-719-081-33	DIODE MA2YD1500LS0			
D902	8-719-081-33	DIODE MA2YD1500LS0			
D903	8-719-420-51	DIODE MA729			
		< FERRITE BEAD >			
FB802	1-414-228-11	FERRITE	0uH		
FB831	1-414-228-11	FERRITE	0uH		
		< IC >			
IC301	8-759-598-15	IC TA2131FL(EL)			
IC501	8-759-689-67	IC SN761057DBT			
IC551	8-759-698-62	IC SC111257FCR2			
@ IC601	8-752-410-49	IC CXD2671-203GA			
IC801	8-759-566-18	IC AK6480BH-E2			
IC901	8-759-698-61	IC XPC18A32FCR2			
		< JACK >			
J301	1-778-368-11	JACK, HEADPHONE (⌒)			
		< COIL >			
L503	1-469-570-11	INDUCTOR	10uH		
L551	1-410-389-31	INDUCTOR CHIP	47uH		
L552	1-410-389-31	INDUCTOR CHIP	47uH		
L553	1-414-400-11	INDUCTOR	22uH		
L554	1-414-400-11	INDUCTOR	22uH		
L901	1-424-701-11	COIL (INDUCTOR)			
L902	1-424-701-11	COIL (INDUCTOR)			
L904	1-414-398-11	INDUCTOR	10uH		
L905	1-414-404-11	INDUCTOR	100uH		
		< TRANSISTOR >			
Q301	8-729-037-52	TRANSISTOR	2SD2216J-QR(TX).SO		
Q501	8-729-922-10	TRANSISTOR	2SA1577-QR		
		< RESISTOR >			
R101	1-218-971-11	RES-CHIP	33K	5%	1/16W
R102	1-218-971-11	RES-CHIP	33K	5%	1/16W
R103	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R104	1-218-929-11	RES-CHIP	10	5%	1/16W
R105	1-218-977-11	RES-CHIP	100K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R106	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R201	1-218-971-11	RES-CHIP	33K	5%	1/16W
R202	1-218-971-11	RES-CHIP	33K	5%	1/16W
R203	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R204	1-218-929-11	RES-CHIP	10	5%	1/16W
R205	1-218-977-11	RES-CHIP	100K	5%	1/16W
R206	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R301	1-218-935-11	RES-CHIP	33	5%	1/16W
R302	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W
R303	1-218-981-11	RES-CHIP	220K	5%	1/16W
R501	1-218-971-11	RES-CHIP	33K	5%	1/16W
R503	1-218-953-11	RES-CHIP	1K	5%	1/16W
R505	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R515	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R516	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R517	1-208-691-11	METAL CHIP	2.2K	0.5%	1/16W
R519	1-218-977-11	RES-CHIP	100K	5%	1/16W
R521	1-242-967-11	RES-CHIP	1	5%	1/16W
R525	1-218-990-11	SHORT	0		
R526	1-218-990-11	SHORT	0		
R554	1-218-990-11	SHORT	0		
R601	1-218-929-11	RES-CHIP	10	5%	1/16W
R602	1-218-935-11	RES-CHIP	33	5%	1/16W
R603	1-218-943-11	RES-CHIP	150	5%	1/16W
R604	1-218-990-11	SHORT	0		
R605	1-218-965-11	RES-CHIP	10K	5%	1/16W
R606	1-218-977-11	RES-CHIP	100K	5%	1/16W
R607	1-218-977-11	RES-CHIP	100K	5%	1/16W
R609	1-218-981-11	RES-CHIP	220K	5%	1/16W
R612	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R613	1-218-945-11	RES-CHIP	220	5%	1/16W
R614	1-218-953-11	RES-CHIP	1K	5%	1/16W
R615	1-202-974-11	RES-CHIP	3.3M	5%	1/16W
R616	1-218-990-11	SHORT	0		
R619	1-218-953-11	RES-CHIP	1K	5%	1/16W
R804	1-218-973-11	RES-CHIP	47K	5%	1/16W
R806	1-218-977-11	RES-CHIP	100K	5%	1/16W
R807	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R808	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R811	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R812	1-218-965-11	RES-CHIP	10K	5%	1/16W
R813	1-218-967-11	RES-CHIP	15K	5%	1/16W
R814	1-218-971-11	RES-CHIP	33K	5%	1/16W
R816	1-218-951-11	RES-CHIP	680	5%	1/16W
R817	1-218-941-11	RES-CHIP	100	5%	1/16W
R818	1-218-941-11	RES-CHIP	100	5%	1/16W
R819	1-218-989-11	RES-CHIP	1M	5%	1/16W
R820	1-218-975-11	RES-CHIP	68K	5%	1/16W
R827	1-218-989-11	RES-CHIP	1M	5%	1/16W
R828	1-218-990-11	SHORT	0		
R830	1-218-990-11	SHORT	0		
R832	1-218-990-11	SHORT	0		
R833	1-218-990-11	SHORT	0		
R837	1-218-990-11	SHORT	0		
R903	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R909	1-218-965-11	RES-CHIP	10K	5%	1/16W
R910	1-218-965-11	RES-CHIP	10K	5%	1/16W
R911	1-218-990-11	SHORT	0		

@Replacement of IC601 used in this set
requires a special tool.

Ref. No.	Part No.	Description			Remarks
R920	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R921	1-218-979-11	RES-CHIP	150K	5%	1/16W
R923	1-218-969-11	RES-CHIP	22K	5%	1/16W
R931	1-218-990-11	SHORT	0		
R934	1-218-990-11	SHORT	0		
R935	1-218-990-11	SHORT	0		
R937	1-218-990-11	SHORT	0		
R939	1-218-990-11	SHORT	0		
R945	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R947	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R949	1-218-953-11	RES-CHIP	1K	5%	1/16W

< COMPOSITION CIRCUIT BLOCK >

RB551	1-233-959-11	RES, NETWORK (CHIP TYPE) 470
RB552	1-233-973-11	RES, NETWORK (CHIP TYPE) 100K
RB553	1-233-967-11	RES, NETWORK (CHIP TYPE) 10K

< SWITCH >

S801	1-786-033-21	SWITCH, TACTILE (■)
S802	1-786-033-21	SWITCH, TACTILE (▶▶▮ ▶)
S803	1-786-033-21	SWITCH, TACTILE (▮◀◀)
S804	1-786-033-21	SWITCH, TACTILE (VOL-)
S805	1-786-033-21	SWITCH, TACTILE (VOL+)
S806	1-786-033-21	SWITCH, TACTILE (PLAY MODE)
S807	1-786-033-21	SWITCH, TACTILE (AVLS)
S809	1-762-498-21	SWITCH, PUSH (1 KEY)(OPEN/CLOSE)
S810	1-771-483-61	SWITCH, PUSH (1 KEY)(HOLD)

< VIBRATOR >

X601	1-795-002-11	VIBRATOR, CERAMIC 45.1584MHz

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MISCELLANEOUS
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51	1-680-453-11	MOTOR FLEXIBLE BOARD
⚠62	X-3379-869-1	OPTICAL PICK-UP BLOCK (LCX-4E)
M901	8-835-706-01	MOTOR, DC SSM18A (SPINDLE)
M902	1-763-399-11	MOTOR, DC (SLED)(WITH PULLY)

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Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	
		***********************************	
	1-251-895-21	BATTERY CASE	
	1-476-211-21	REMOTE CONTROL UNIT	
⚠	1-528-252-21	BATTERY CHARGER (BC-7S)(UK)	
	1-528-299-41	BATTERY, NI-CD (NC-6WM)(AEP,UK,FR)	
⚠	1-528-434-13	BATTERY CHARGER (BC-7SG)(AUS)	
	1-528-543-11	BATTERY, NI-CD (NC-6WM)(AUS,E,HK,KR)	
⚠	1-528-580-21	BATTERY CHARGER (BC-7HT)(E)	
⚠	1-528-661-15	BATTERY CHARGER (BC-7DR)(KR)	
⚠	1-528-744-23	BATTERY CHARGER (BC-7DY)(AEP,FR)	
⚠	1-569-007-11	ADAPTOR, CONVERSION 2P(E)	
⚠	1-756-115-11	CHARGER, BATTERY (BC-7SP2)(HK)	
	3-008-521-01	CASE, BATTERY CHARGE(AEP,UK,AUS,E,FR,KR)	
	3-008-521-21	CASE, BATTERY CHARGE(HK)	
	3-021-018-11	LABEL, FRANCE(FR)	
	3-043-060-01	CASE, CHARGE (C/D)(HK)	
	3-220-749-01	CASE, CARRYING	
	3-224-424-11	MANUAL, INSTRUCTION(ENGLISH,SPANISH) (AEP,UK,AUS,E,HK,KR)	
	3-224-424-21	MANUAL, INSTRUCTION (FRENCH,GERMAN)(AEP,FR)	
	3-224-424-31	MANUAL, INSTRUCTION (DUTCH,SWEDISH)(AEP)	
	3-224-424-41	MANUAL, INSTRUCTION (ITALIAN,PORTUGUESE)(AEP)	
	3-224-424-51	MANUAL, INSTRUCTION (FINNISH,RUSSIAN)(AEP)	
	3-224-424-61	MANUAL, INSTRUCTION (CHINESE,KOREAN)(E,HK,KR)	
	8-953-304-90	RECEIVER MDR-E805SP	

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

MZ-E500