

# MZ-E501

## SERVICE MANUAL

Ver 1.2 2001.12  
With SUPPLEMENT-1

AEP Model  
Hong Kong Model



US and foreign patents licensed from Dolby Laboratories Licensing Corporation

Model Name Using Similar Mechanism	MZ-E500
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:  $\lambda = 790 \text{ nm}$

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 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  $\pm 3 \text{ dB}$

#### 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 3V DC

AC power adaptor for the battery charging stand (supplied): AC230~240V, 50Hz

#### Battery operation time

See "When to replace or recharge the battery"

#### Dimensions

Approx. 74.5 × 80.5 × 17.9 mm (w/h/d) ( $3 \times 3 \frac{1}{4} \times 2 \frac{23}{32}$  in.) (not including projecting parts and controls)

#### Mass

Approx. 80 g (2.8 oz) (the player only)

#### Supplied accessories

Headphones/earphones with a remote control (1)

Battery charging stand (assembly needed)(1)

AC power adaptor\*

Rechargeable battery (1)

Rechargeable battery carrying case (1)

Dry battery case (1)

Carrying pouch (1)

AC plug adaptor (1) (world model only)

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Design and specifications are subject to change without notice.

## PORTABLE MINIDISC PLAYER

9-873-162-03

2001L1600-1

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Personal Audio Company

Published by Sony Engineering Corporation

# SONY®

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**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.

**Unleaded solder**

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead. (Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)



**: LEAD FREE MARK**

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.  
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.  
Soldering irons using a temperature regulator should be set to about 350°C.  
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity  
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder  
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

**SAFETY-RELATED COMPONENT WARNING!!**

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

## SECTION 1 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.

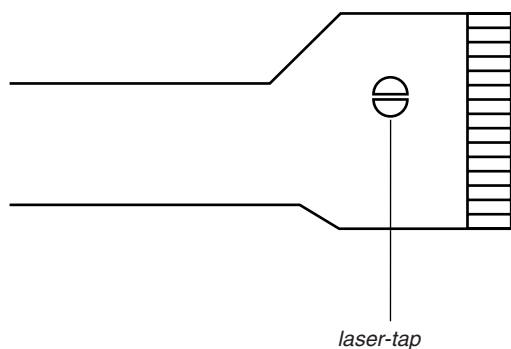
The flexible board is easily damaged and should be handled with care.

### 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.

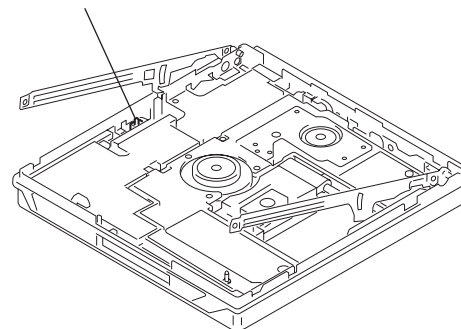


**OPTICAL PICK-UP FLEXIBLE BOARD**

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).

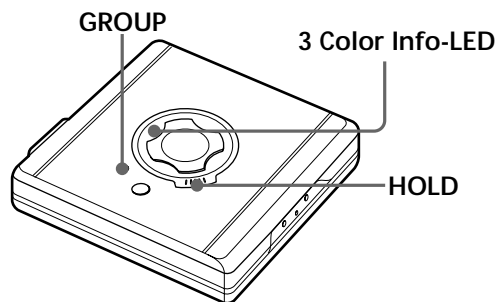
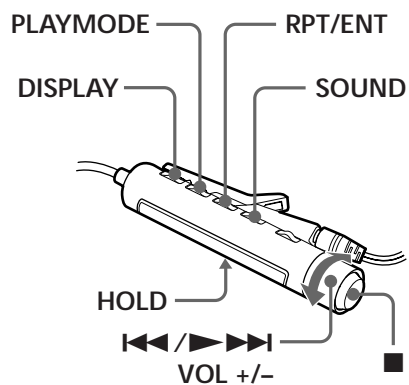
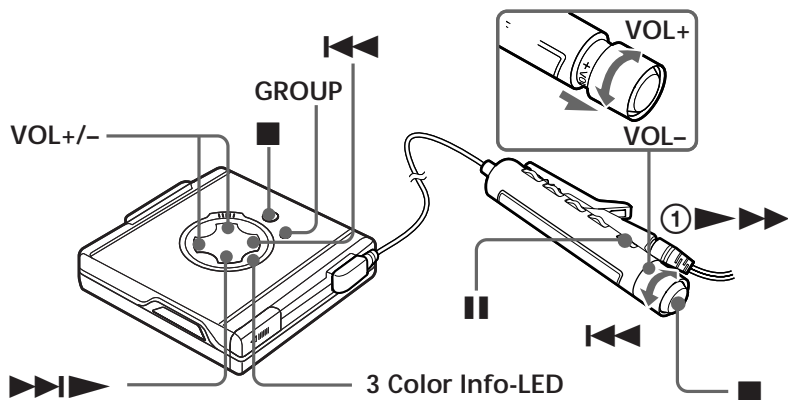
*Open/Close detection switch (S809)*



\* Replacement of CXD2671-205GA (IC601) used in this set requires a special tool.

This section is extracted from instruction manual.

LOCATION AND FUNCTION OF CONTROLS



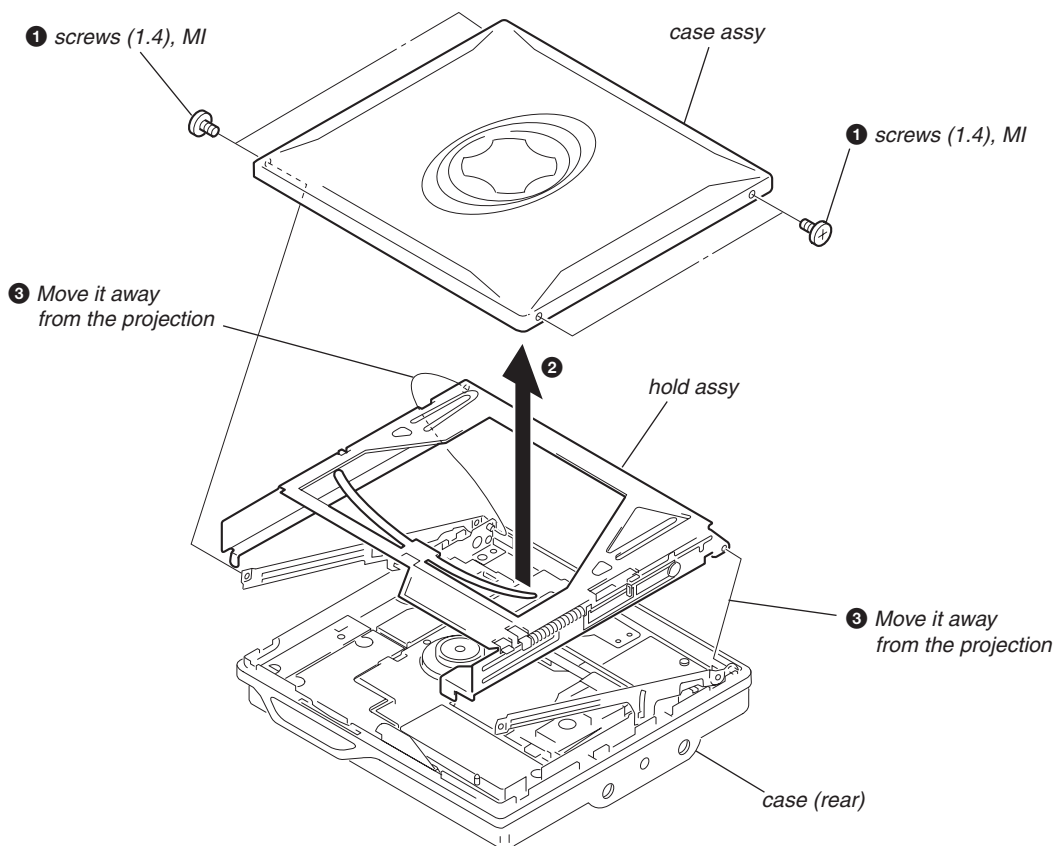
## SECTION 3 DISASSEMBLY

- Disassemble the unit in the order as shown below.

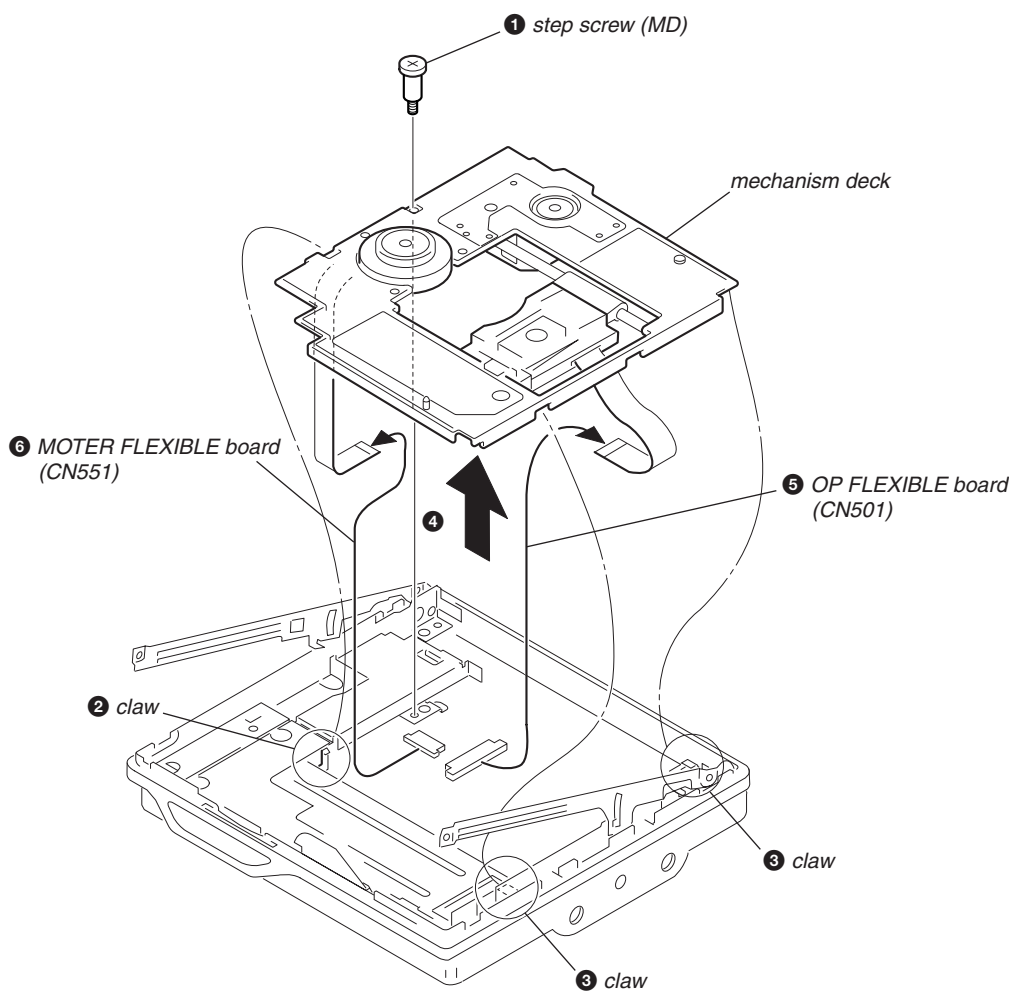
Set → Case assy, Holder assy → Mechanism deck → Bracket assy → MAIN board  
 ↳ Optical pick-up assy (LCX-4E)

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

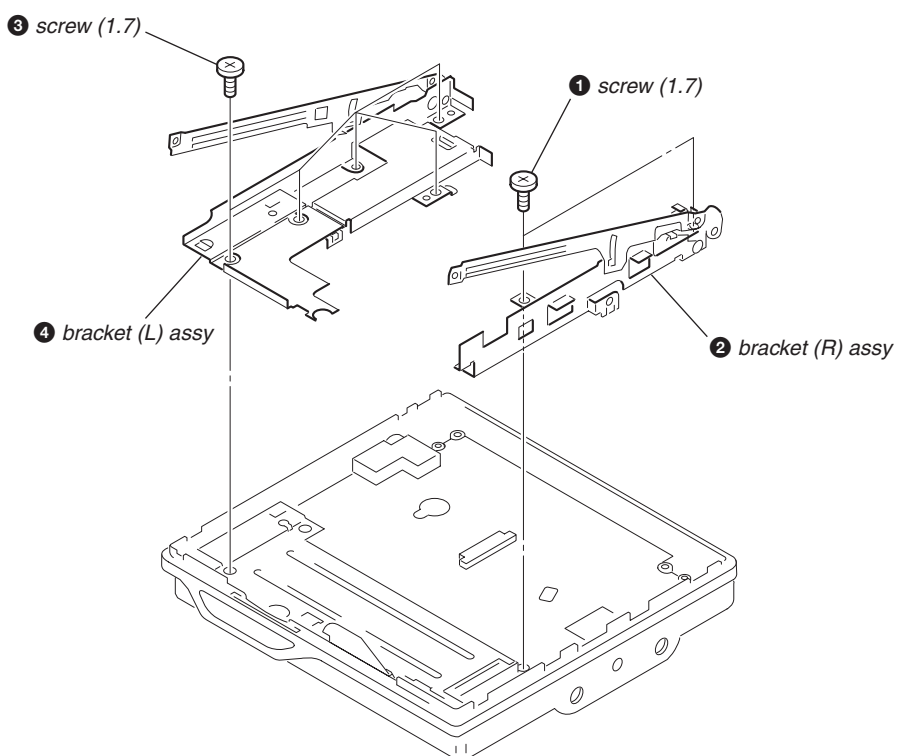
### 3-1. CASE ASSY, HOLDER ASSY



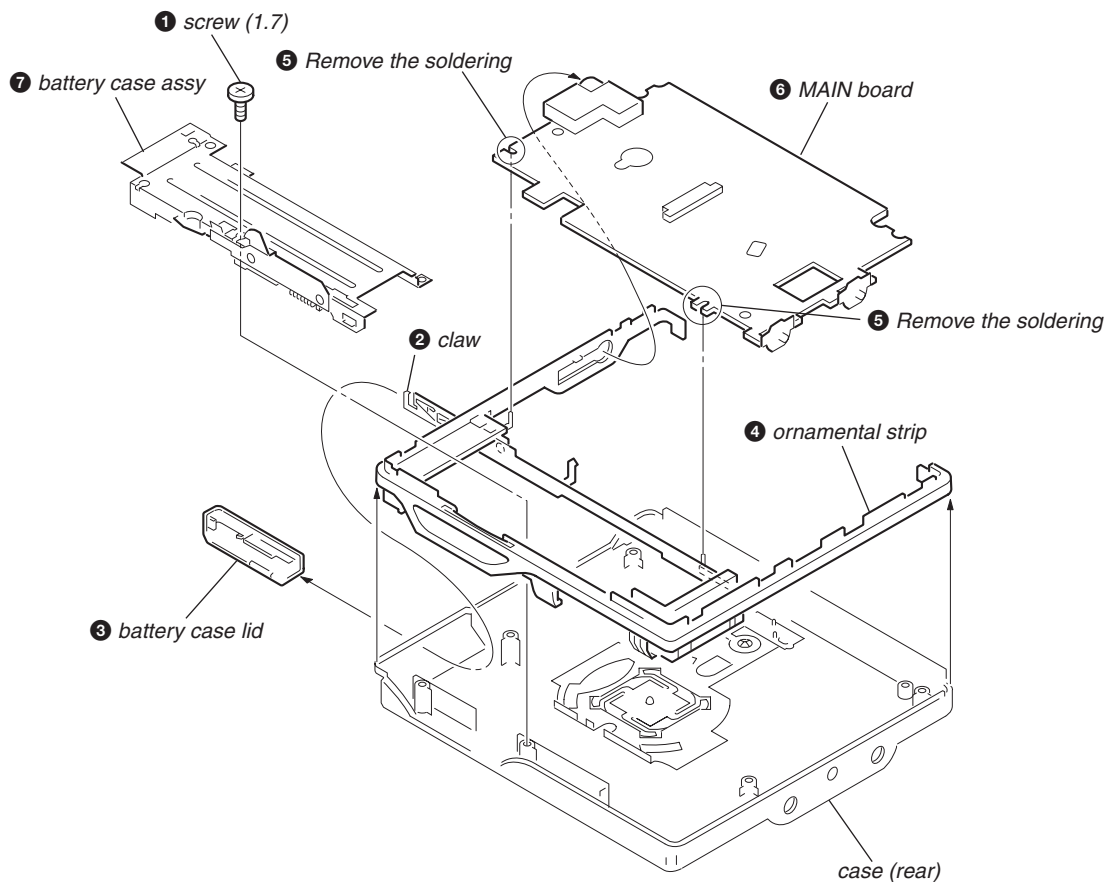
3-2. MECHANISM DECK



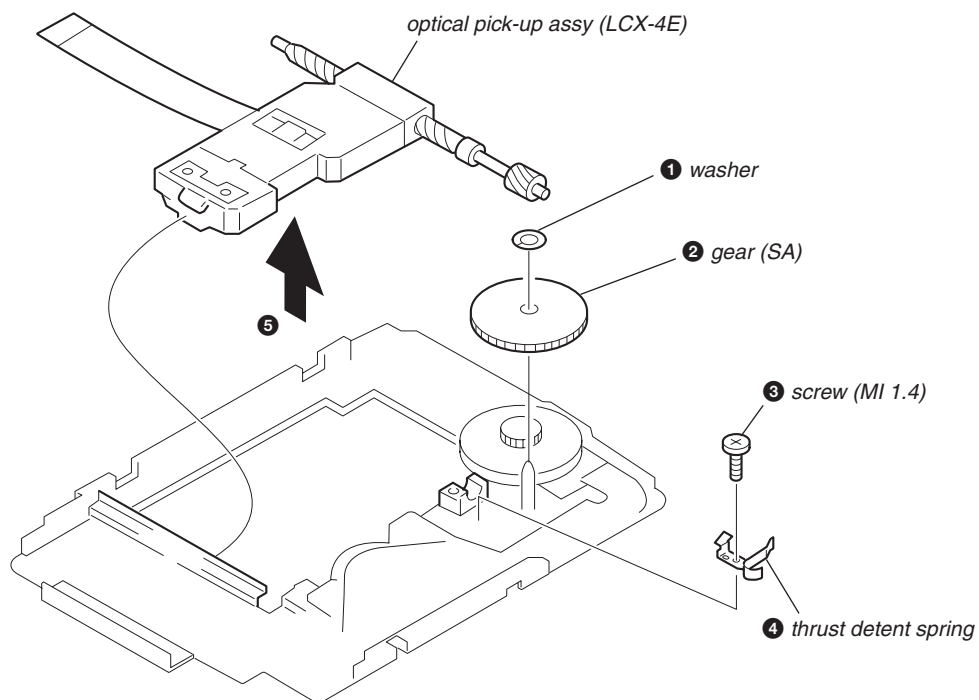
3-3. BRACKET ASSY



3-4. MAIN BOARD



3-5. OPTICAL PICK-UP ASSY (LCX-4E)



## SECTION 4 TEST MODE


### 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.

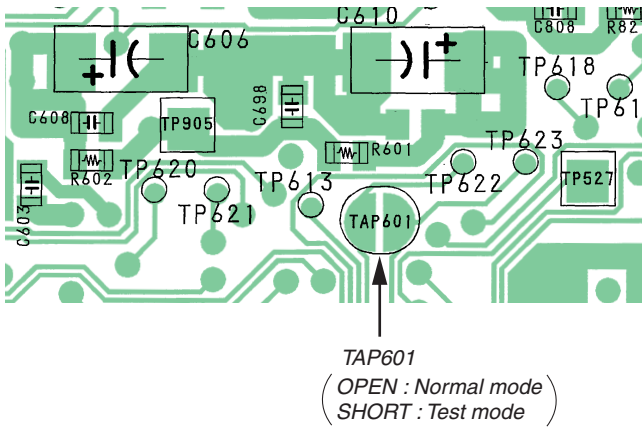
### 4-2. SETTING THE TEST MODE


#### 4-2-1. How to set the TEST MODE

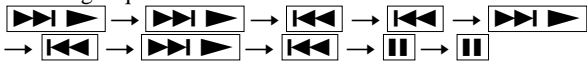
To set the TEST MODE, two methods are available.

- ① Solder bridge and short TAP601 (TEST) on the main board.  
Then turn on the power. Press the  button or close the upper panel.

MAIN BOARD (SIDE B)



- ② In the normal mode, operate the keys on the set and those on the remote control rapidly 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:



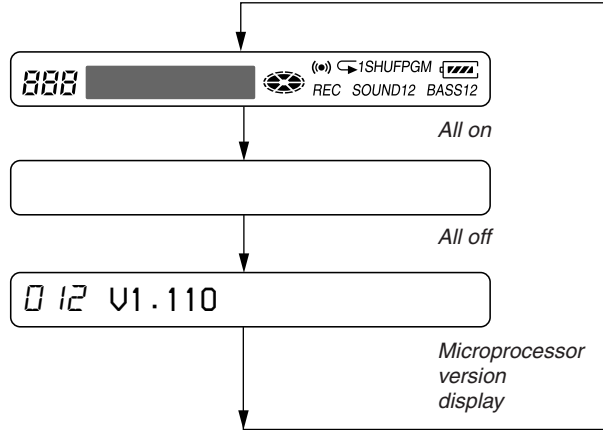
Note : When you press an incorrect switch by mistake, remove your hands from the switches and perform all the operations once again from the very beginning.


#### 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



- 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.

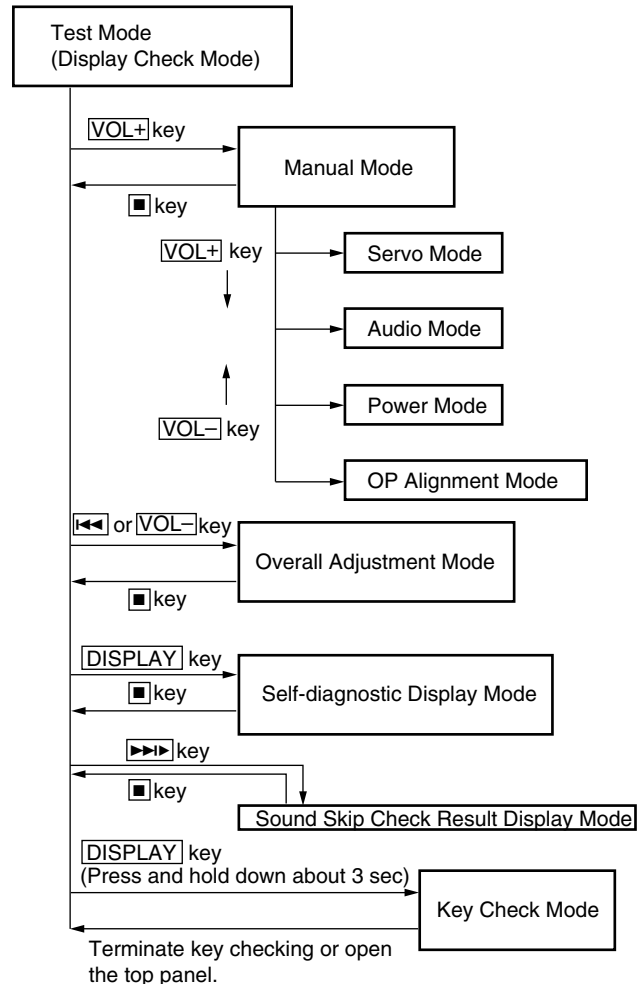
Note : The solder should be removed clean. The remaining solder may make a short with the chassis and other part.

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.

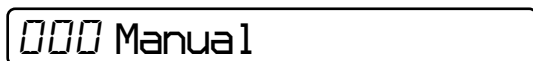
Usually, no adjustments are made in this mode.

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

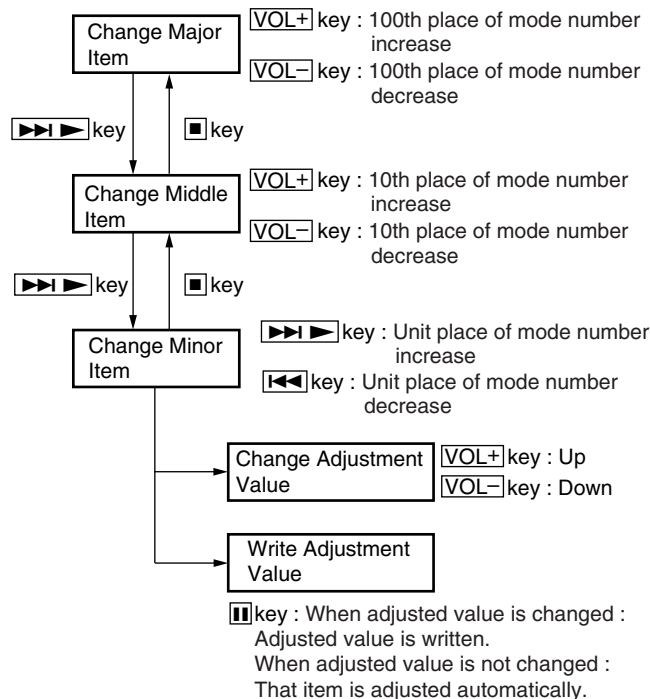
#### 4-4-2. How to set the Manual mode

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

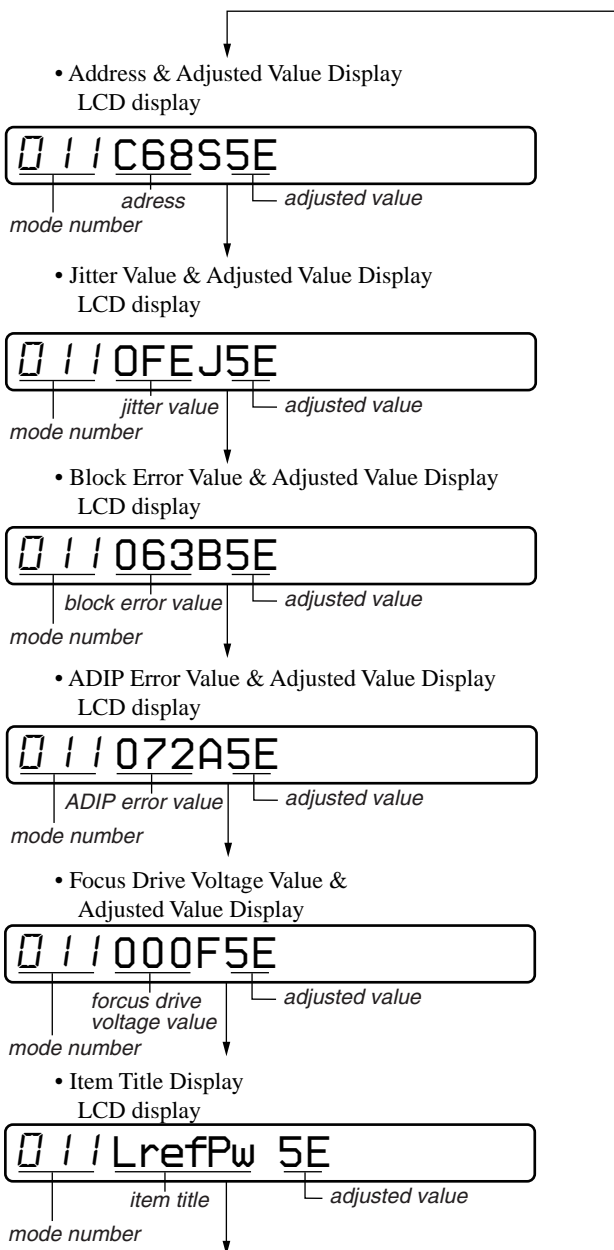
Remote control LCD display



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.



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



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**

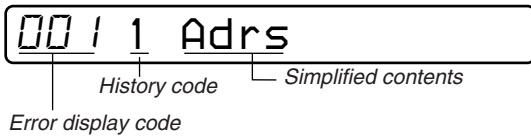
**4-6-1. Outline of the function**

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.

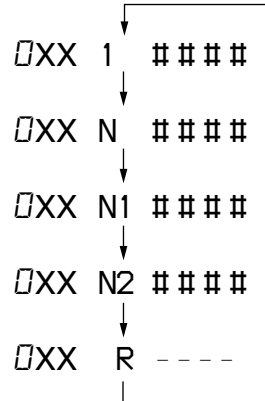
This history, which can be viewed in the TEST MODE, provides the means of locating the fault in troubleshooting.

**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.



3. Hereinafter, each time [Next] key is pressed, the reference information display changes as follows:



- Press [Previous] 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-E501)

• 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 [Reset] 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)

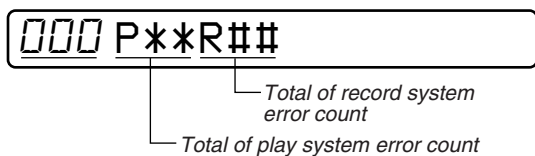
### 4-7. Sound Skip Check Result Display Mode

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 key activates the sound skip check result display mode where the LCD displays as shown below.

LCD display



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 one by one.



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	Decoder 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

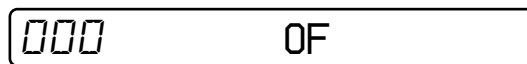
#### 4-8-1. Outline of the function

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 key (for more than 3 sec) to set the Key Check mode.

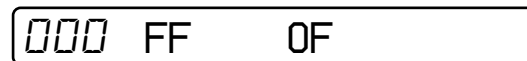
LCD display



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)

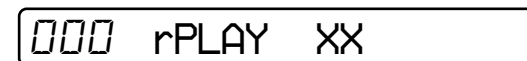
Example: When key on the set is pressed:

LCD display



Example: When key on the remote control is pressed:

LCD display

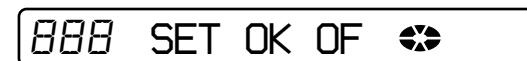


XX: AD value of the remote control key (hexadecimal 00 to FF)

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



Example: When the keys on the remote control are considered as OK:

LCD display



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.

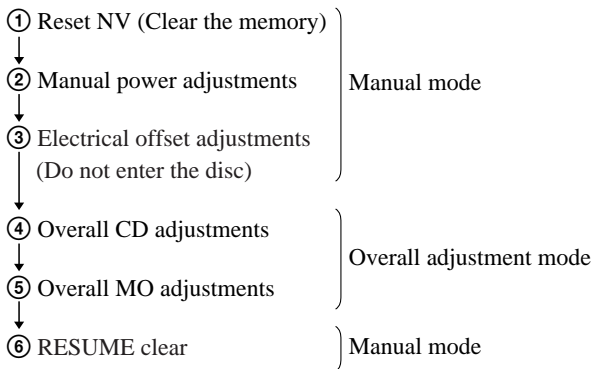
#### 5-2. NOTES FOR ADJUSTMENT

##### 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:



##### 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  key.



LCD display

000 Assy 00

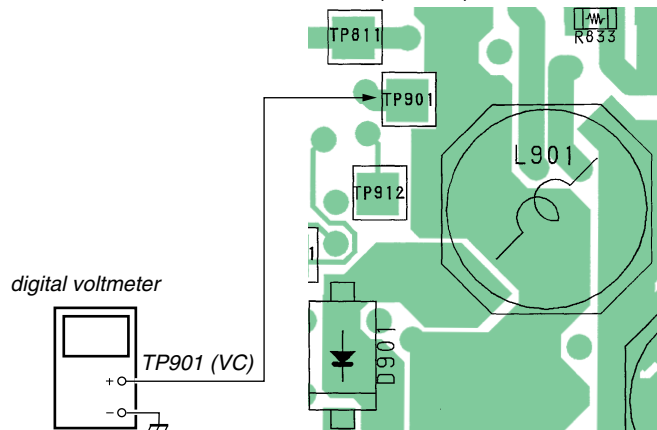
4. Press  key, and item No. will change to 762.


LCD display

762 Vc1PWM XX

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

##### MAIN BOARD (SIDE B)

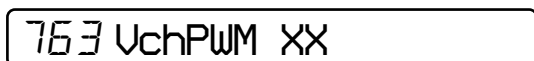


6. Press  key to write the adjustment value. Item No. will change to 763.

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

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

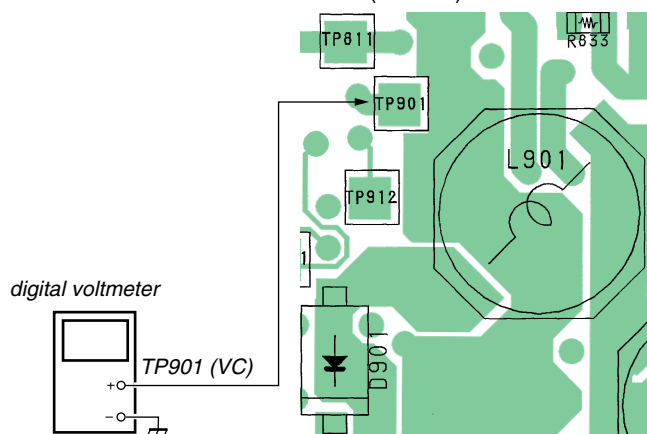
LCD display



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:2.74 to 2.755V

MAIN BOARD (SIDE B)

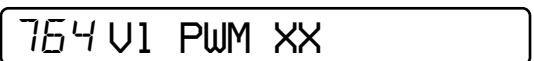


3. Press [ENTER] key to write the adjustment value.(Item No. will change to 764)

**5-4-4. VLL PWM Duty adjustment method**

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

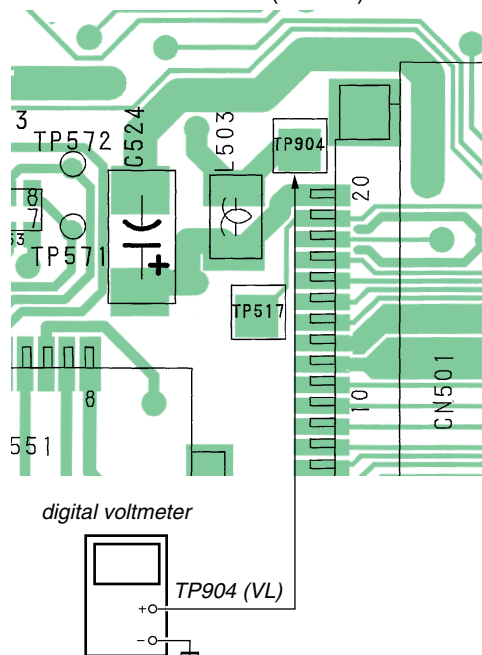
LCD display



2. Connect a digital voltmeter to TP904 (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

MAIN BOARD (SIDE B)



3. Press [ENTER] key to write the adjustment value.  
The adjustment completion display appears as follows.

LCD display

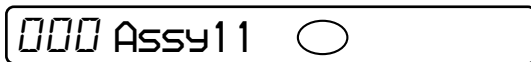


**5-4-5. Electrical offset adjustment method**

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

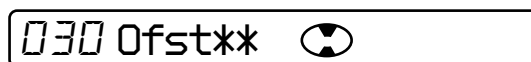
1. Confirm the power voltage is 1.5V.
2. Set to the test mode.
3. Press the [VOL-] key activates the overall adjustment mode.

LCD display



4. Press the [DISPLAY] key.

LCD display



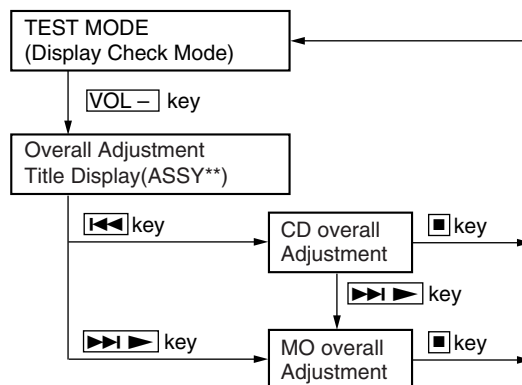
5. If result of electrical offset adjustment is OK, the following display appears.

LCD display



**5-5. OVERALL ADJUSTMENT MODE**

**5-5-1. Overall adjustment mode structure**

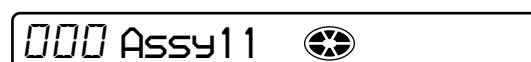


Note: The overall adjustments should be always performed in the sequence of CD → MO adjustments.

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

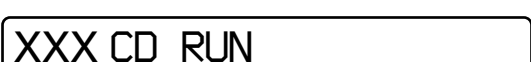
1. Set the TEST MODE and press [VOL-] key to set the Overall Adjustment mode.

LCD display



2. Insert CD disc in the set, and press [LEFT] key to set the Overall CD Adjustment mode.  
Automatic adjustments are made.

LCD display



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

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

LCD display


000 XXX NG

XXX: NG item No.

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

LCD display

XXX CD OK

- 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.

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

LCD display

000 XXX NG

XXX: NG item No.

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

LCD display


000 MO OK

**5-5-3.Resume clear method**

- Setting the test mode.
- Set the Manual mode and set the item No.043(RESUME Clear).

LCD display

043 Resume CC

- Press the  key.

LCD display

043 Res \*\*\*

After reset is completed

043 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	R_GV 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
LPIT adjustment	
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**

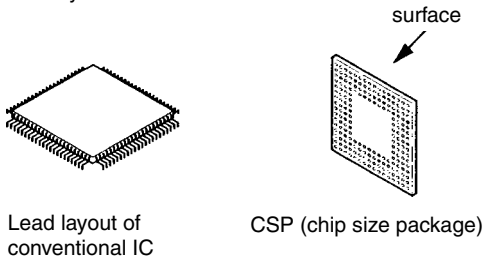
- — : parts extracted from the component side.
- : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

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

- Main boards is four-layer printed 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



**Note on Schematic Diagram: MAIN SECTION**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\mu\text{F}$   
 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.
- $\triangle$  : internal component.

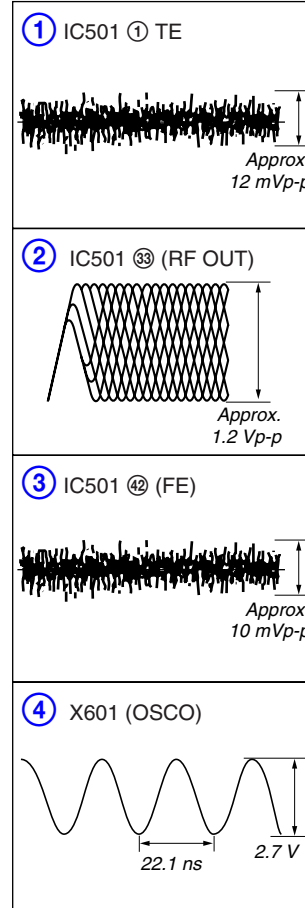
**Note:** The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety. Replace only with part number specified.

- : 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 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.
- ⇒ : Audio (Analog)
- ⇒ : Audio (Digital)

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

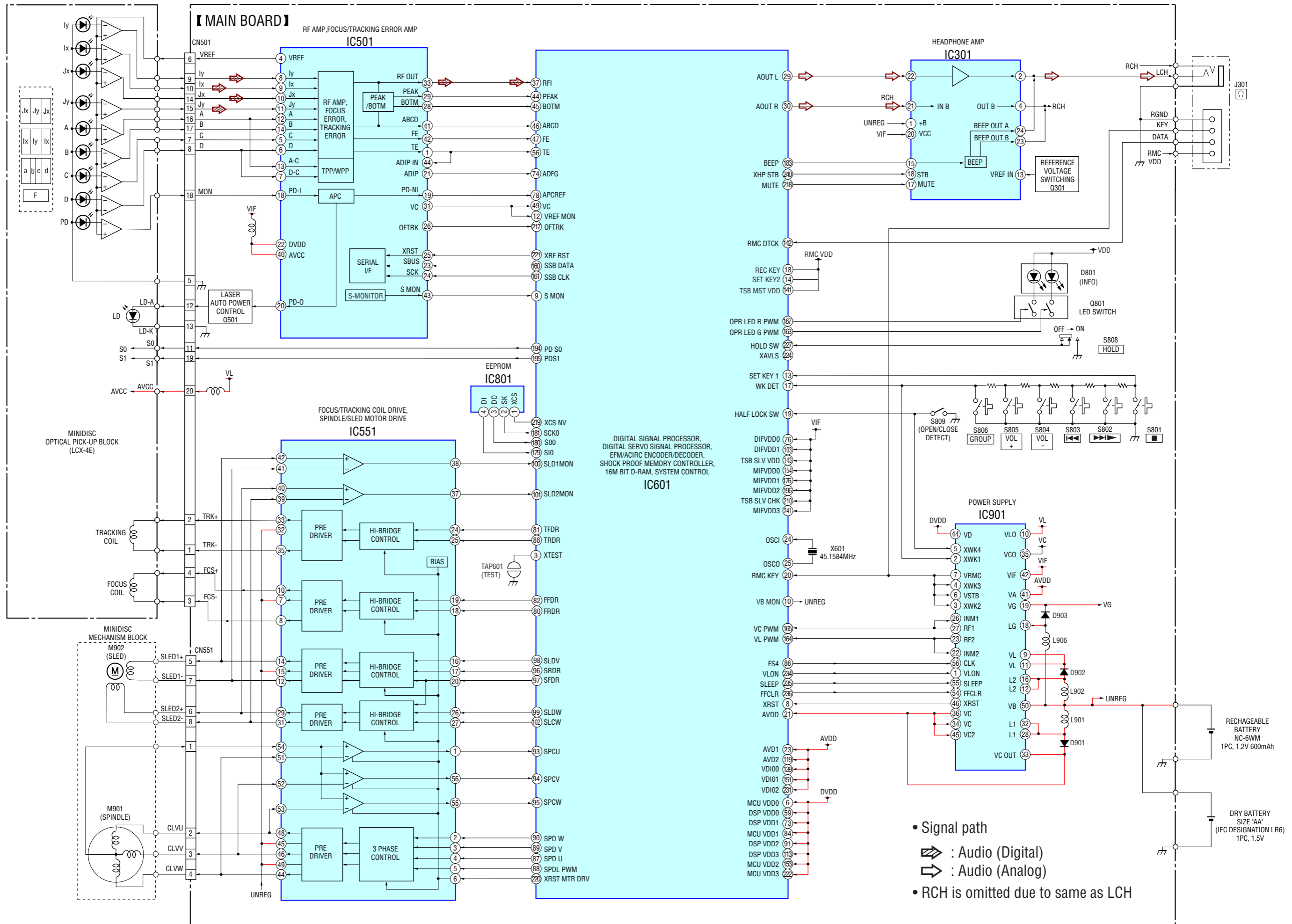
- The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different from that of conventional IC.

• WAVEFORMS

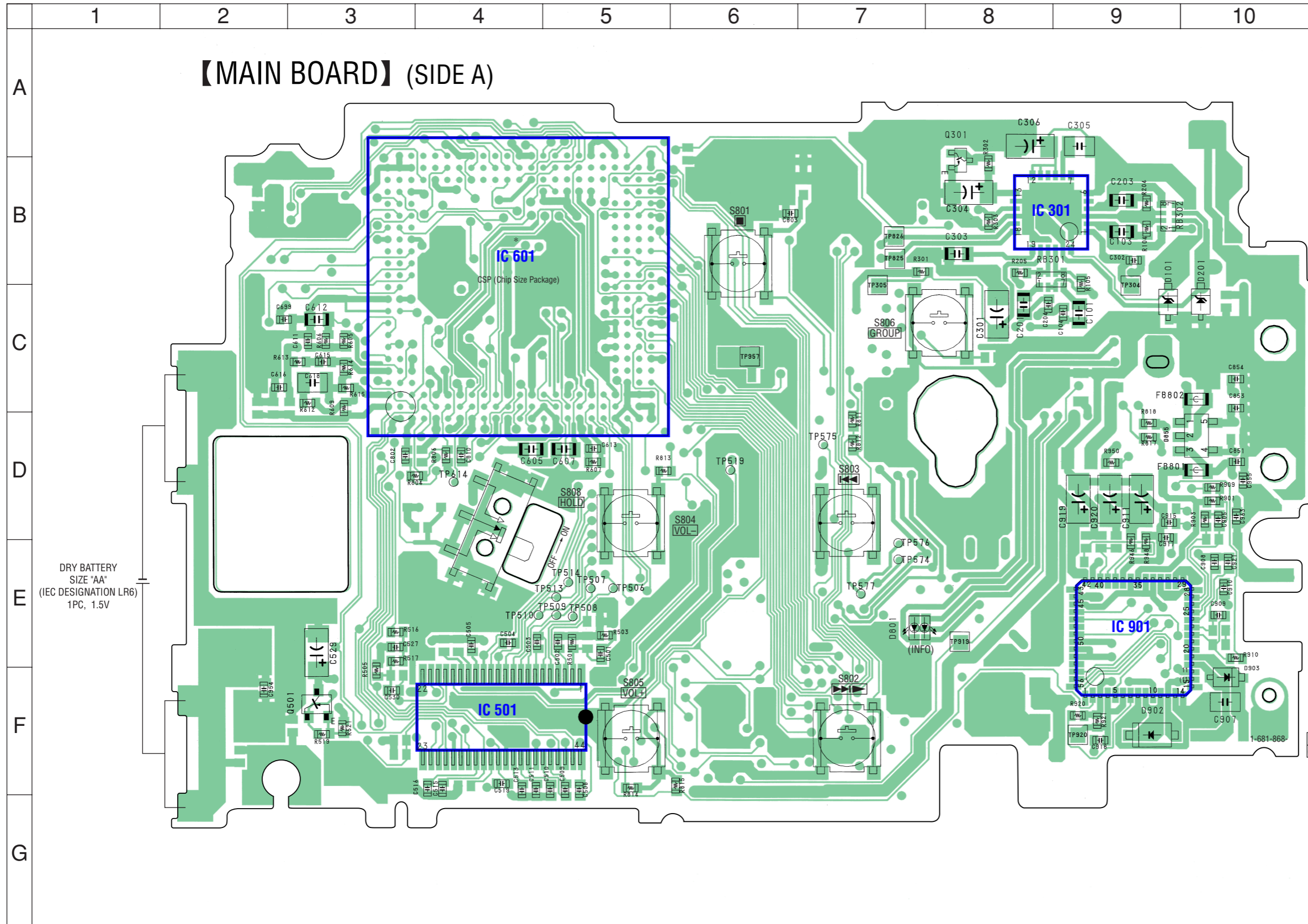




6-1. BLOCK DIAGRAM



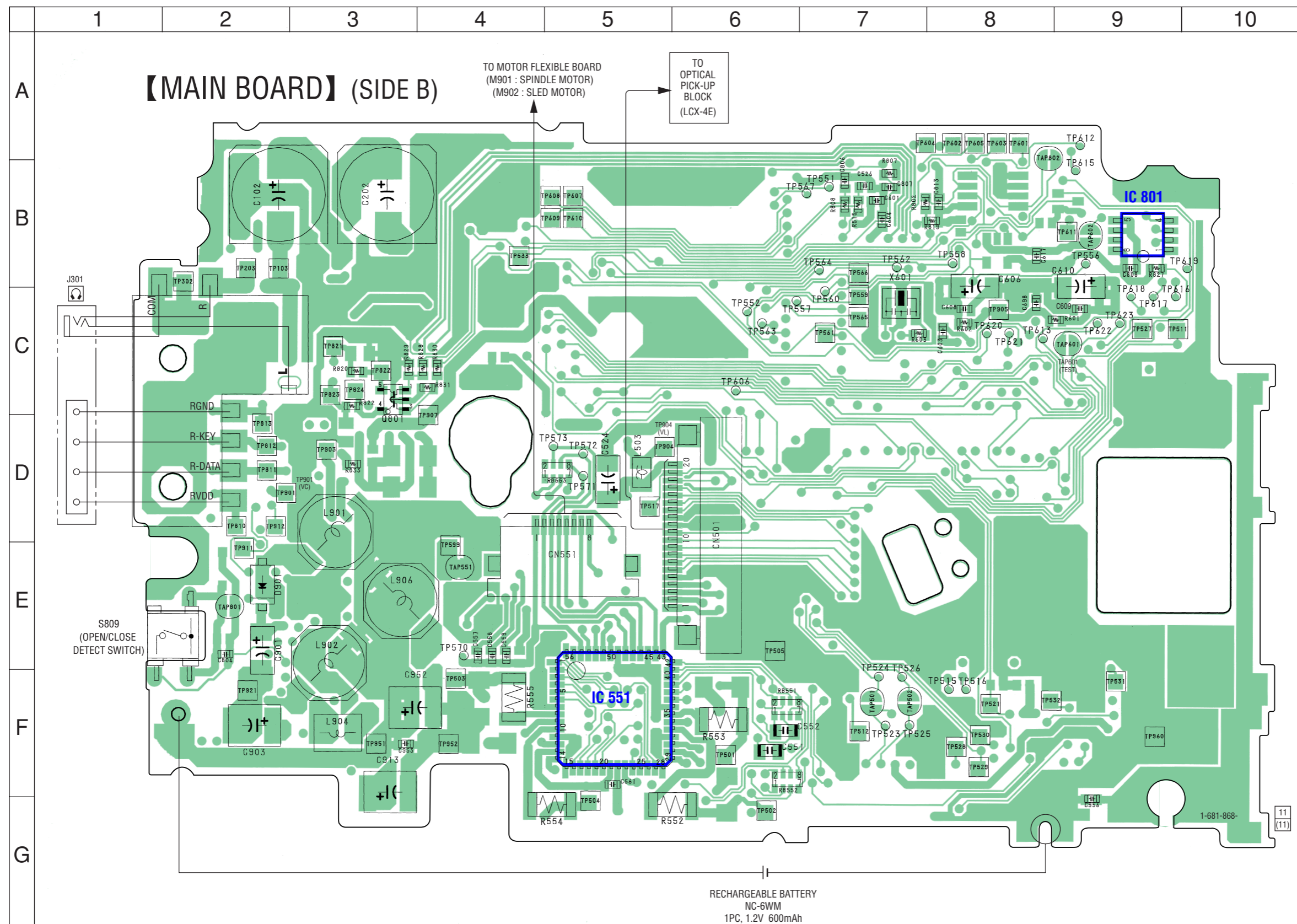
6-2. PRINTED WIRING BOARD – MAIN SECTION (SIDE A) –



• Semiconductor Location

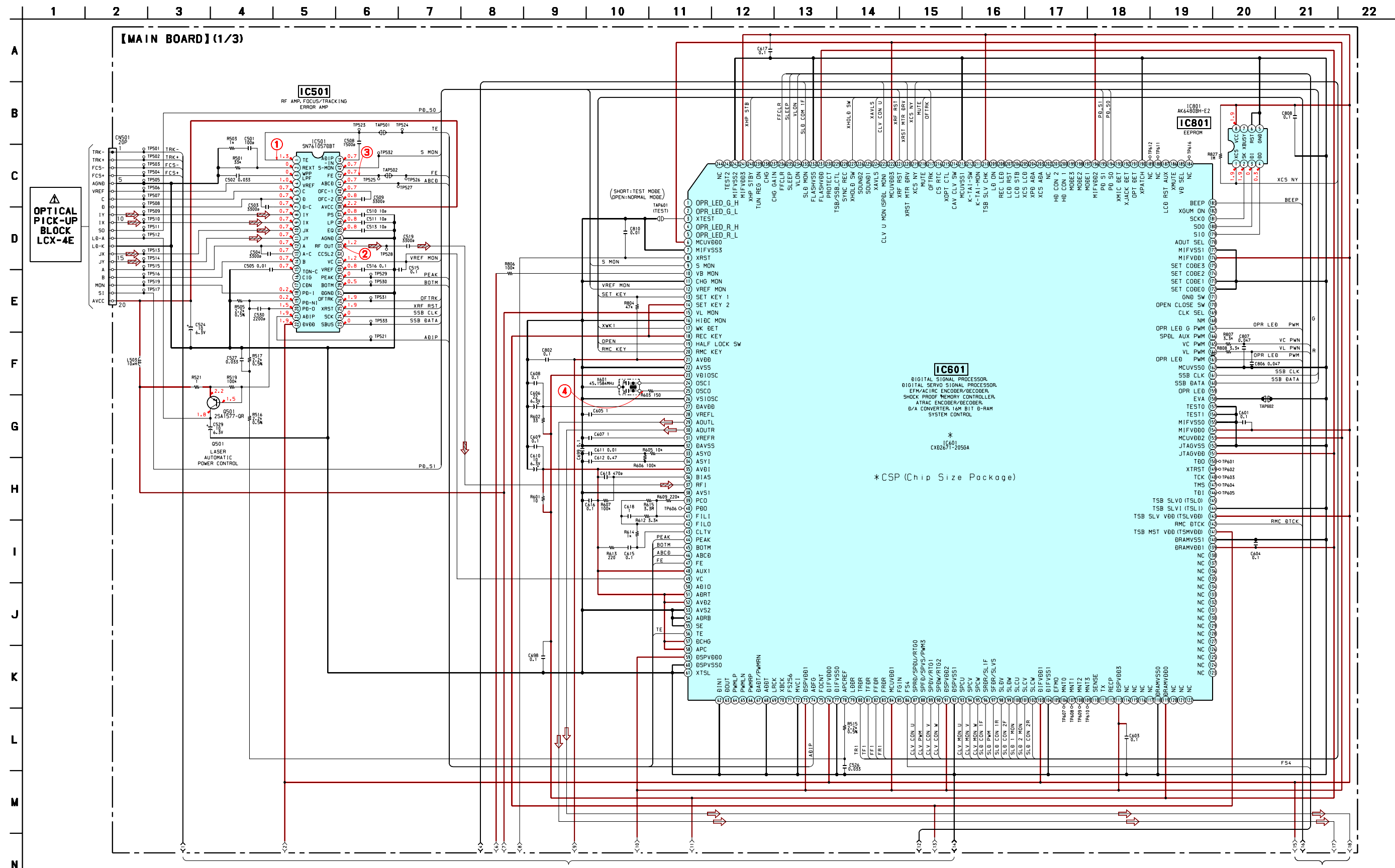
Ref. No.	Location
D101	C-9
D201	C-10
D801	E-7
D855	D-10
D902	F-9
D903	F-10
IC301	B-9
IC501	F-4
IC601	B-4
IC901	E-9
Q301	A-8
Q501	F-3

6-3. PRINTED WIRING BOARD – MAIN SECTION (SIDE B) –

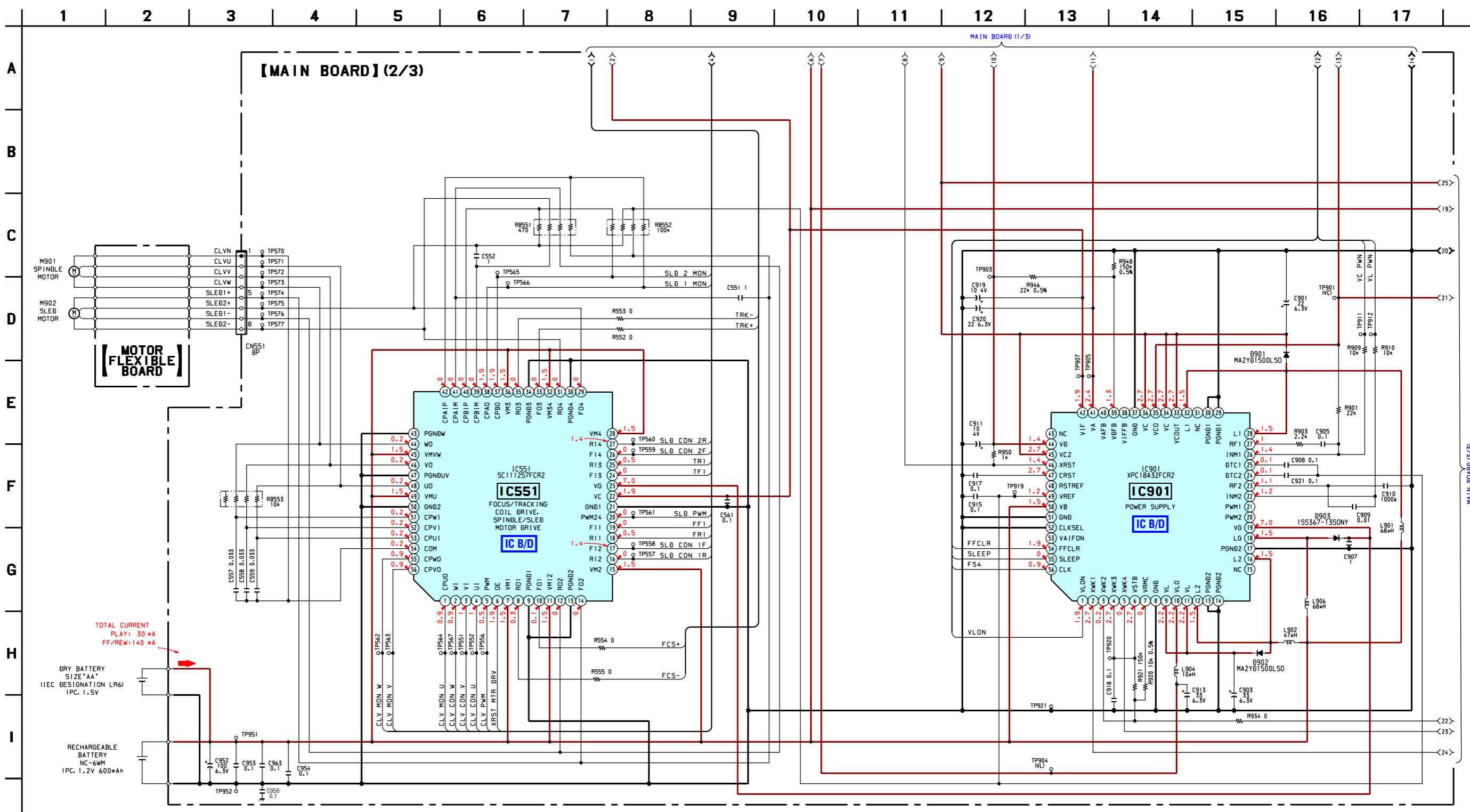


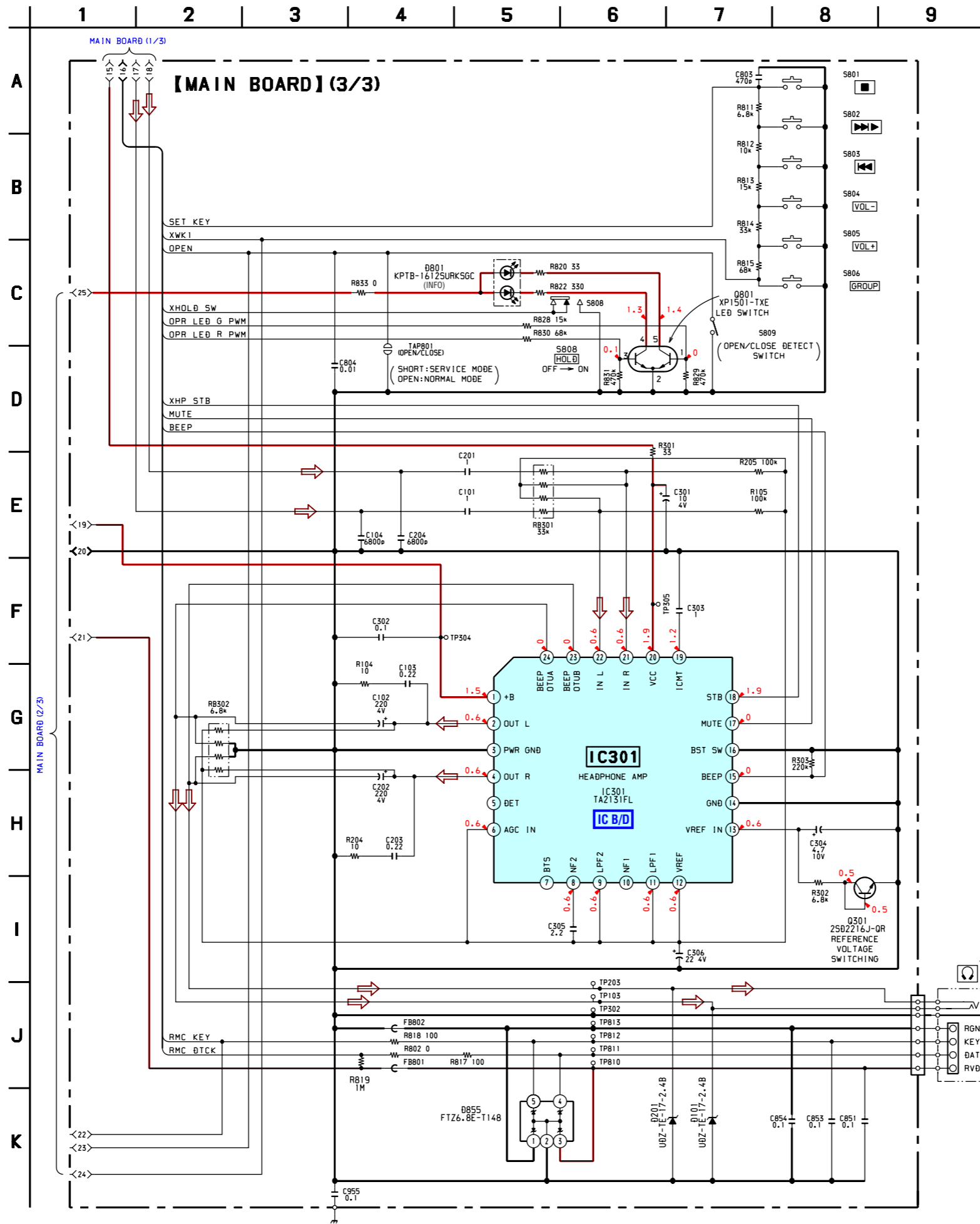
• Semiconductor Location

Ref. No.	Location
D901	E-2
IC551	F-5
IC801	B-9
Q801	C-3



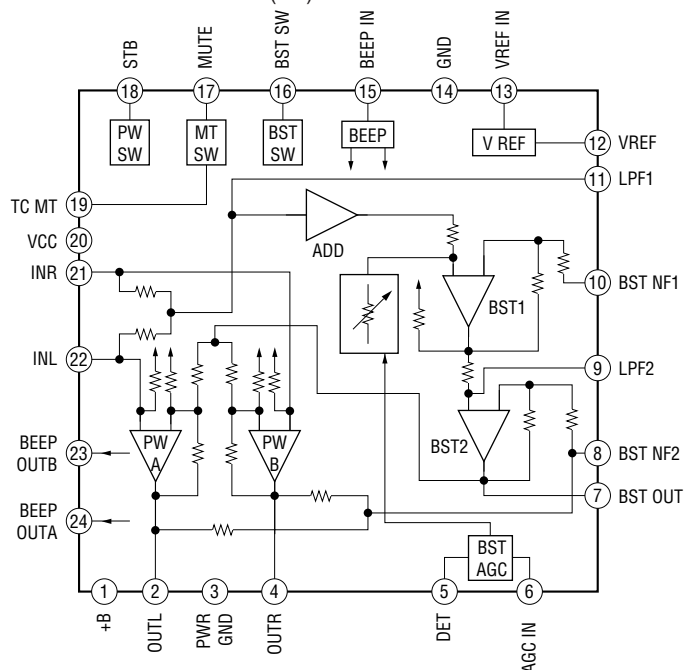
6-5. SCHEMATIC DIAGRAM – MAIN SECTION (2/3) – • See page 23, 24 for IC Block Diagrams.



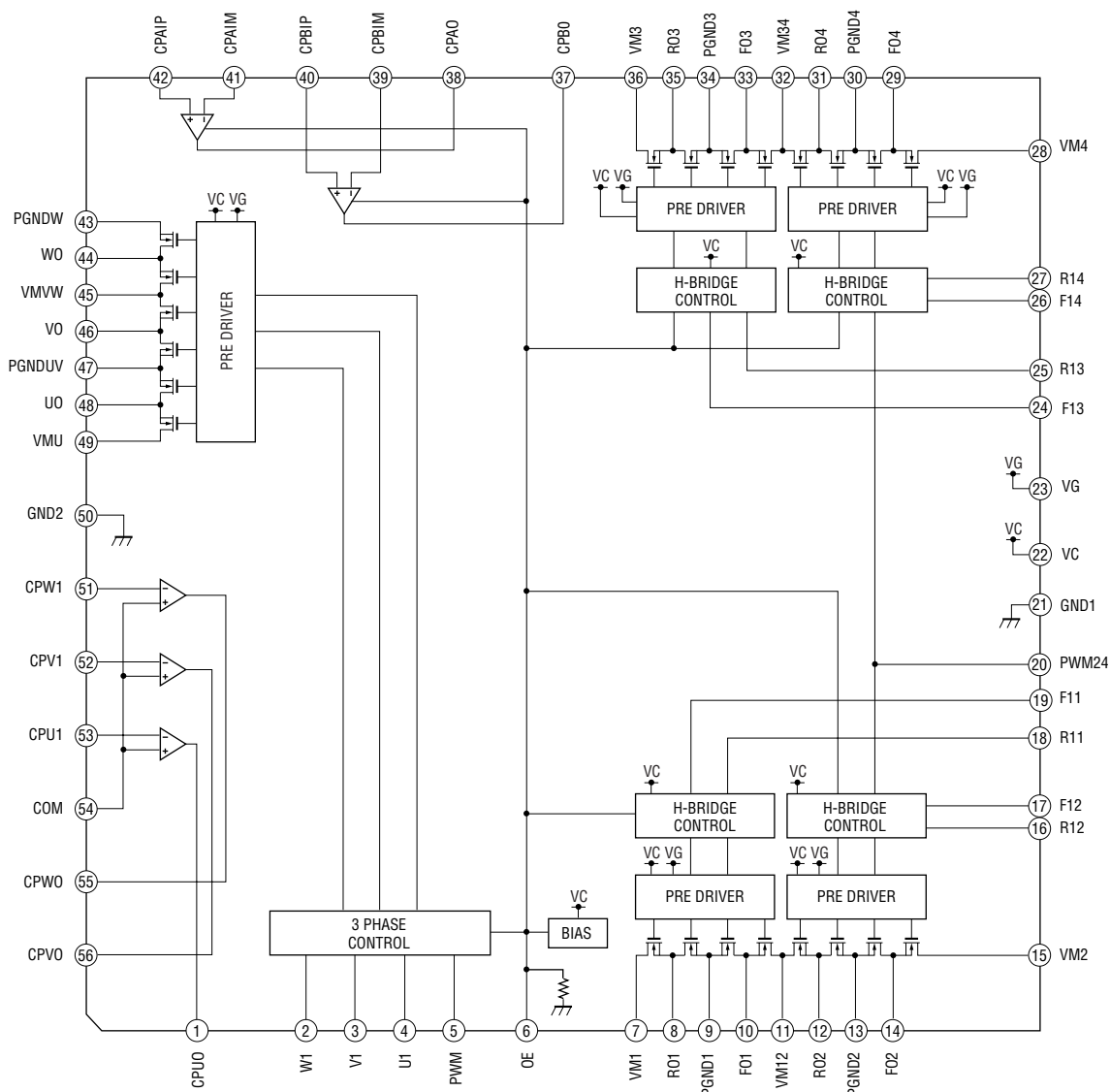


6-7. IC BLOCK DIAGRAMS

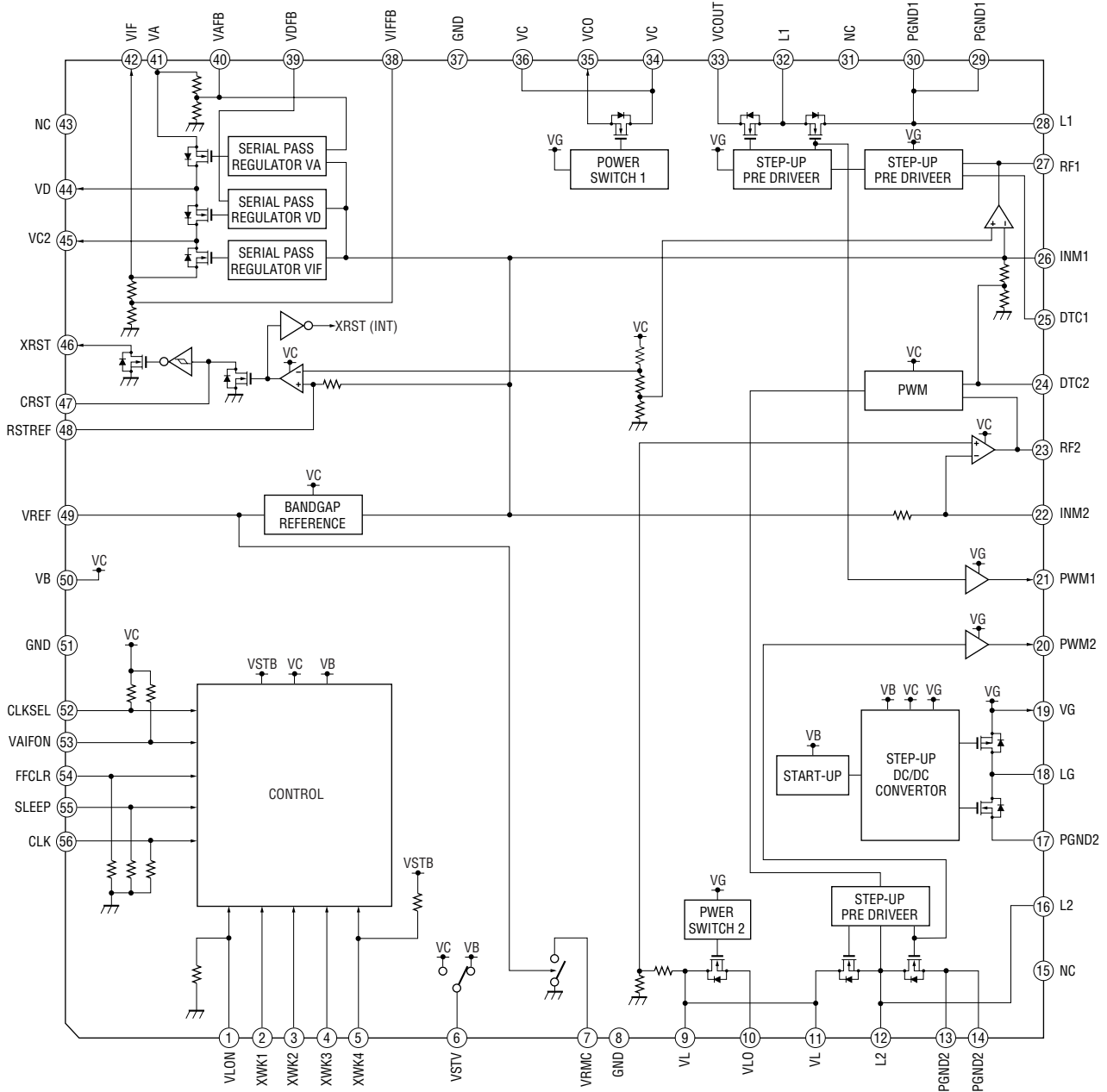
IC301 TA2131FL (EL)



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 (Not used in this set)
17	CDN	I	Connect terminal to the external capacitor for the low-pass filter of CSL divider denominator (Not used in this set)
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 $\pm$ 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 $\pm$ 3kHz) input terminal, 3 times speed

• IC601 CXD2671-205GA (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Description
1	OPR_LED_G_H	O	High intensity green LED control (open)
2	OPR_LED_G_L	O	Low intensity green LED control (open)
3	XTEST	I	Input terminal for the test mode detection
4	OPR_LED_R_H	O	High intensity red LED control (open)
5	OPR_LED_R_L	O	Low intensity red LED control (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/PWMRN	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 compare input (U)/2-phase drive compare input (1)
101	SLCV	I	Brushless sled motor 3-phase drive compare input (V)/2-phase drive compare input (2)
102	SLCW	I	Brushless sled motor 3-phase drive compare input (W)/2-phase compare 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 (Not used in this set)
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	OPR_LED_R_PWM	O	Operation LED (R) control PWM
164	VL PWM	—	PWM for the laser power supply voltage control
165	VC PWM	—	PWM for the system power supply voltage control
166	SPDL_AUX_PWM	O	Spindle auxiliary control PWM
167	OPR_LED_G_PWM	O	Operation LED (G) control PWM
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	O	Set code 0
173	SET CODE1	O	Set code 1
174	SET CODE2	O	Set code 2
175	SET CODE3	O	Set code 3
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	SIO	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	NC	—	Not used (open)
185	VD. SEL	O	Not used (open)
186	XMUTE	O	Not used (open)
187	LCD_RST_AUX	O	Not used (open)
188-189	NC	O	Not used (open)
190	X PATCH	I	Not used (connected to ground)
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)

Pin No.	Pin Name	I/O	Description
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)
210	TSB SLV CHK	I	TSB slave check
211	K-TAI_MON	I	Not used (open)
212	K-TAI_SW	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	XAVLS	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	TSB_SSB_CTL	O	TSB/SSB switching
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	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)

## SECTION 7 EXPLODED VIEWS

**NOTE:**

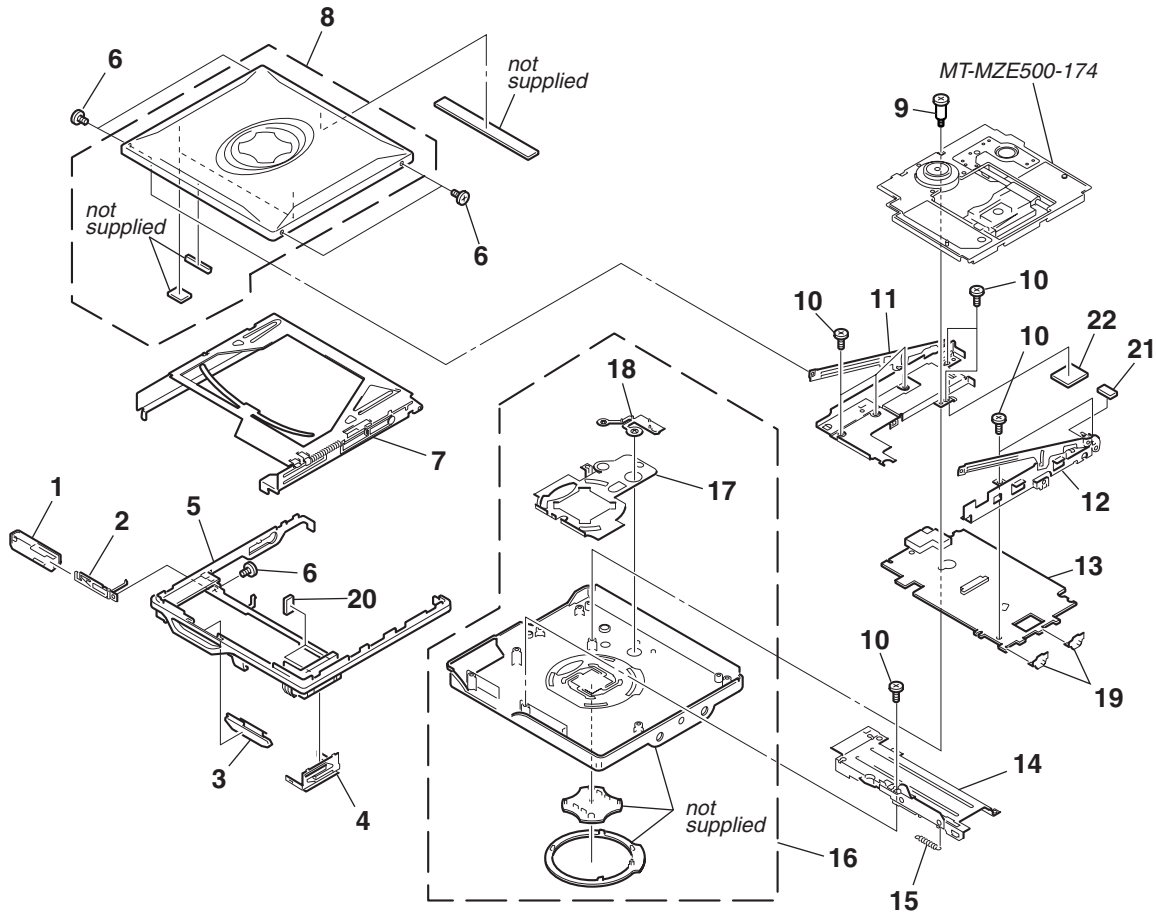
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Color Indication of Appearance Parts Example:  
KNOB, BALANCE (WHITE) . . . (RED)

↑                          ↑  
Parts of Color    Cabinet's Color

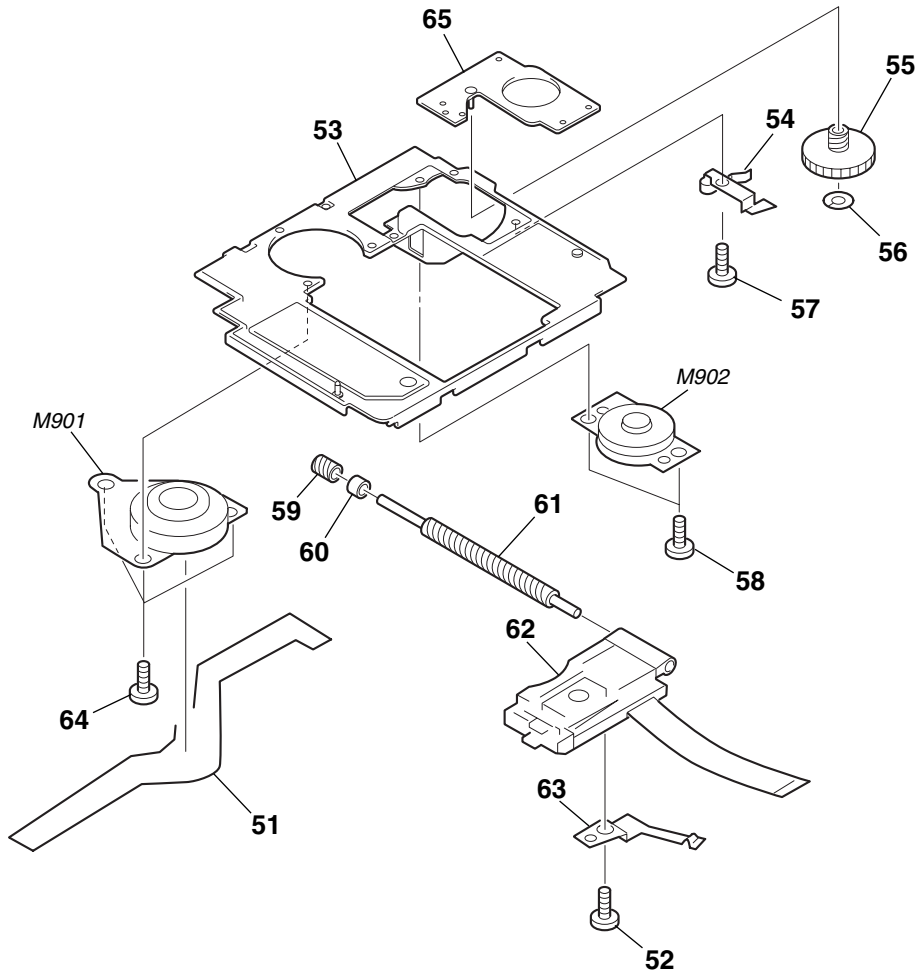
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

### 7-1. MAIN SECTION



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	3-232-193-01	LID, BATTERY CASE (SILVER)		9	3-049-051-01	SCREW (MD), STEP	
1	3-232-193-11	LID, BATTERY CASE (PINK)		10	3-318-382-02	SCREW (1.7), TAPPING	
1	3-232-193-21	LID, BATTERY CASE (BLUE)		11	X-3380-734-1	BRACKET (L) ASSY	
1	3-232-193-31	LID, BATTERY CASE (YELLOW)		12	X-3380-735-1	BRACKET (R) ASSY	
2	X-3380-732-1	TERMINAL ASSY, BATTERY		* 13	A-3021-503-A	MAIN BOARD, COMPLETE	
3	3-232-180-01	BUTTON (OPEN)		14	X-3380-733-1	CASE ASSY, BATTERY	
4	3-224-025-01	TERMINAL BOARD (MINUS)		15	4-989-078-01	SPRING (OPEN), TENSION	
5	3-232-179-01	STRIP, ORNAMENTAL (SILVER)		16	X-3380-896-1	CASE ASSY (SILVER)	
5	3-232-179-11	STRIP, ORNAMENTAL (PINK)		16	X-3380-897-1	CASE ASSY (PINK)	
5	3-232-179-21	STRIP, ORNAMENTAL (BLUE)		16	X-3380-898-1	CASE ASSY (BLUE)	
5	3-232-179-31	STRIP, ORNAMENTAL (YELLOW)		16	X-3380-899-1	CASE ASSY (YELLOW)	
6	4-218-233-09	SCREW (1.4), MI		17	3-232-194-01	PLATE, ELECTROSTATIC	
7	X-3380-870-1	HOLDER ASSY (S)		18	3-232-178-01	BUTTON (B), CONTROL	
8	X-3380-740-1	LID ASSY, UPPER (SILVER)		19	4-225-074-01	TERMINAL BOARD	
8	X-3380-741-1	LID ASSY, UPPER (PINK)		20	3-241-062-01	SHEET (BATT CASE)	
8	X-3380-742-1	LID ASSY, UPPER (BLUE)		21	3-234-918-01	SHEET (FITTING R)	
8	X-3380-743-1	LID ASSY, UPPER (YELLOW)		22	3-234-920-01	SHEET (JACK)	

7-2. MECHANISM SECTION



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	1-680-453-11	MOTOR FLEXIBLE BOARD		61	4-222-203-01	SCREW, LEAD	
52	3-222-392-01	SCREW (M1.4), TAPPING		△62	X-3379-869-1	OPTICAL PICK-UP ASSY (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	
56	3-338-645-51	WASHER		M901	8-835-706-01	MOTOR, DC SSM18A/C-NP (SPINDLE)	
57	4-218-233-01	SCREW (1.4), MI		M902	1-763-399-11	MOTOR, DC (SLED)(WITH PULLY)	
58	4-218-233-13	SCREW (1.4), MI					
59	4-222-208-01	GEAR (SB)					
60	3-043-237-02	BEARING (N)					

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



## SECTION 8 ELECTRICAL PARTS LIST

MAIN

**NOTE:**

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

- CAPACITORS:  
uF:  $\mu$ F
- RESISTORS  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS  
uH:  $\mu$ H

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

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

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-3021-503-A	MAIN BOARD, COMPLETE *****		C604	1-107-820-11	CERAMIC CHIP 0.1uF	16V
	4-225-074-03	TERMINAL BOARD		C605	1-115-156-11	CERAMIC CHIP 1uF	10V
		< CAPACITOR >		C606	1-119-750-11	TANTAL. CHIP 22uF	20.00% 6.3V
C101	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C607	1-115-156-11	CERAMIC CHIP 1uF	10V
C102	1-126-210-11	ELECT CHIP 220uF	20% 4V	C608	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C103	1-115-467-11	CERAMIC CHIP 0.22uF	10.00% 10V	C609	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C104	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V	C610	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V
C201	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C611	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C202	1-126-210-11	ELECT CHIP 220uF	20% 4V	C612	1-125-891-11	CERAMIC CHIP 0.47uF	10.00% 10V
C203	1-115-467-11	CERAMIC CHIP 0.22uF	10.00% 10V	C613	1-164-935-11	CERAMIC CHIP 470PF	10.00% 16V
C204	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V	C615	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C301	1-135-201-11	TANTALUM CHIP 10uF	20% 4V	C616	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C302	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C617	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C303	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C618	1-109-982-11	CERAMIC CHIP 1uF	10.00% 10V
C304	1-135-181-11	TANTALUM CHIP 4.7uF	20% 6.3V	C698	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C305	1-125-838-11	CERAMIC CHIP 2.2uF	10% 6.3V	C699	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C306	1-104-847-11	TANTAL. CHIP 22uF	20.00% 4V	C802	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C501	1-164-931-11	CERAMIC CHIP 100PF	10.00% 16V	C803	1-164-935-11	CERAMIC CHIP 470PF	10.00% 16V
C502	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C804	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C503	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C806	1-119-923-11	CERAMIC CHIP 0.047uF	10.00% 10V
C504	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C807	1-119-923-11	CERAMIC CHIP 0.047uF	10.00% 10V
C505	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V	C808	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C508	1-164-938-11	CERAMIC CHIP 0.0015uF	10.00% 16V	C810	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C509	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C851	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C510	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 16V	C853	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V
C511	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 16V	C854	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C513	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 16V	C901	1-137-739-11	TANTALUM 22uF	20% 6.3V
C515	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C903	1-104-752-11	TANTAL. CHIP 33uF	20.00% 6.3V
C516	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V	C905	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C519	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C907	1-109-982-11	CERAMIC CHIP 1uF	10.00% 10V
C524	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V	C908	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C526	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C909	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C527	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C910	1-164-937-11	CERAMIC CHIP 0.001uF	10.00% 16V
C529	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V	C911	1-135-201-11	TANTALUM CHIP 10uF	20% 4V
C530	1-164-939-11	CERAMIC CHIP 0.0022uF	10.00% 16V	C913	1-104-752-11	TANTAL. CHIP 33uF	20.00% 6.3V
C551	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C915	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C552	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C917	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C557	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C918	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C558	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C919	1-135-201-11	TANTALUM CHIP 10uF	20% 4V
C559	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C920	1-119-750-11	TANTAL. CHIP 22UF	20.00% 6.3V
C561	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C921	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C601	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C952	1-128-964-11	TANTAL. CHIP 100uF	20% 6.3V
C603	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C953	1-107-820-11	CERAMIC CHIP 0.1uF	16V
				C954	1-107-820-11	CERAMIC CHIP 0.1uF	16V
				C955	1-107-820-11	CERAMIC CHIP 0.1uF	16V

**MAIN**

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C956	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R515	1-208-895-11	METAL CHIP 2.2K	0.5% 1/16W
C963	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R516	1-208-895-11	METAL CHIP 2.2K	0.5% 1/16W
< CONNECTOR >				R517	1-208-895-11	METAL CHIP 2.2K	0.5% 1/16W
* CN501	1-778-168-11	CONNECTOR, FFC/FPC (ZIF) 20P		R519	1-218-977-11	RES-CHIP 100K	5% 1/16W
* CN551	1-793-124-11	CONNECTOR, FPC (ZIP) 8P		R521	1-242-967-11	RES-CHIP 1	5% 1/16W
< DIODE >				R552	1-216-296-11	SHORT	0
D101	8-719-064-91	DIODE 02DZ2.4-Z(TPH3)		R553	1-216-296-11	SHORT	0
D201	8-719-064-91	DIODE 02DZ2.4-Z(TPH3)		R554	1-216-296-11	SHORT	0
D801	8-719-085-54	LED KPTB-1612SURKSGC (INFO)		R555	1-216-296-11	SHORT	0
D855	8-719-066-17	DIODE FTZ6.8E-T148		R601	1-218-929-11	RES-CHIP 10	5% 1/16W
D901	8-719-081-33	DIODE MA2YD1500LS0		R602	1-218-935-11	RES-CHIP 33	5% 1/16W
D902	8-719-081-33	DIODE MA2YD1500LS0		R603	1-218-943-11	RES-CHIP 150	5% 1/16W
D903	8-719-049-09	DIODE 1SS367-T3SONY		R605	1-218-965-11	RES-CHIP 10K	5% 1/16W
< FERRITE BEAD >				R606	1-218-977-11	RES-CHIP 100K	5% 1/16W
FB801	1-414-228-11	FERRITE 0uH		R607	1-218-977-11	RES-CHIP 100K	5% 1/16W
FB802	1-414-228-11	FERRITE 0uH		R609	1-218-981-11	RES-CHIP 220K	5% 1/16W
< IC >				R612	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
IC301	8-759-598-15	IC TA2131FL(EL)		R613	1-218-945-11	RES-CHIP 220	5% 1/16W
IC501	8-759-689-67	IC SN761057DBT		R614	1-218-953-11	RES-CHIP 1K	5% 1/16W
IC551	8-759-698-62	IC SC111257FCR2		R615	1-202-974-11	RES-CHIP 3.3M	5% 1/16W
@ IC601	8-752-413-13	IC CXD2671-205GA		R802	1-218-990-11	SHORT	0
IC801	8-759-566-18	IC AK6480BH-E2		R804	1-218-973-11	RES-CHIP 47K	5% 1/16W
IC901	8-759-698-61	IC XPC18A32FCR2		R806	1-218-977-11	RES-CHIP 100K	5% 1/16W
< JACK >				R807	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
J301	1-793-288-71	JACK (♂)		R808	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
< COIL >				R811	1-218-963-11	RES-CHIP 6.8K	5% 1/16W
L503	1-469-570-11	INDUCTOR 10uH		R812	1-218-965-11	RES-CHIP 10K	5% 1/16W
L901	1-419-258-11	INDUCTOR 68uH		R813	1-218-967-11	RES-CHIP 15K	5% 1/16W
L902	1-419-646-11	INDUCTOR 47uH		R814	1-218-971-11	RES-CHIP 33K	5% 1/16W
L904	1-414-398-31	INDUCTOR 10uH		R815	1-218-975-11	RES-CHIP 68K	5% 1/16W
L906	1-419-258-11	INDUCTOR 68uH		R817	1-218-941-11	RES-CHIP 100	5% 1/16W
< TRANSISTOR >				R818	1-218-941-11	RES-CHIP 100	5% 1/16W
Q301	8-729-042-27	TRANSISTOR 2SC4738F-Y/GR(TPL3)		R819	1-218-989-11	RES-CHIP 1M	5% 1/16W
Q501	8-729-922-10	TRANSISTOR 2SA1577-T106-QR		R820	1-218-935-11	RES-CHIP 33	5% 1/16W
Q801	8-729-429-44	TRANSISTOR XP1501-TXE		R822	1-218-947-11	RES-CHIP 330	5% 1/16W
< RESISTOR >				R827	1-218-989-11	RES-CHIP 1M	5% 1/16W
R104	1-218-929-11	RES-CHIP 10	5% 1/16W	R828	1-218-967-11	RES-CHIP 15K	5% 1/16W
R105	1-218-977-11	RES-CHIP 100K	5% 1/16W	R829	1-218-985-11	RES-CHIP 470K	5% 1/16W
R204	1-218-929-11	RES-CHIP 10	5% 1/16W	R830	1-218-975-11	RES-CHIP 68K	5% 1/16W
R205	1-218-977-11	RES-CHIP 100K	5% 1/16W	R831	1-218-985-11	RES-CHIP 470K	5% 1/16W
R301	1-218-935-11	RES-CHIP 33	5% 1/16W	R833	1-218-990-11	SHORT	0
R302	1-218-963-11	RES-CHIP 6.8K	5% 1/16W	R901	1-218-969-11	RES-CHIP 22K	5% 1/16W
R303	1-218-981-11	RES-CHIP 220K	5% 1/16W	R903	1-218-957-11	RES-CHIP 2.2K	5% 1/16W
R501	1-218-971-11	RES-CHIP 33K	5% 1/16W	R909	1-218-965-11	RES-CHIP 10K	5% 1/16W
R503	1-218-953-11	RES-CHIP 1K	5% 1/16W	R910	1-218-965-11	RES-CHIP 10K	5% 1/16W
R505	1-208-895-11	METAL CHIP 2.2K	0.5% 1/16W	R920	1-208-911-11	METAL CHIP 10K	0.5% 1/16W
< COMPOSITION CIRCUIT BLOCK >				R921	1-218-979-11	RES-CHIP 150K	5% 1/16W
RB301	1-233-970-11	RES, NETWORK (CHIP TYPE) 33K		R946	1-208-919-11	METAL CHIP 22K	0.5% 1/16W
RB302	1-233-966-11	RES, NETWORK (CHIP TYPE) 6.8K		R948	1-208-939-11	METAL CHIP 150K	0.5% 1/16W
RB551	1-233-959-11	RES, NETWORK (CHIP TYPE) 470		R950	1-218-953-11	RES-CHIP 1K	5% 1/16W
RB552	1-233-973-11	RES, NETWORK (CHIP TYPE) 100K					
RB553	1-233-967-11	RES, NETWORK (CHIP TYPE) 10K					

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
		< SWITCH >				ACCESSORIES *****	
S801	1-786-033-11	SWITCH, TACTILE (■)			1-251-895-11	BATTERY CASE	
S802	1-786-033-11	SWITCH, TACTILE (▶▶▶▶)			1-476-211-21	REMOTE CONTROL UNIT (RM-MC10L)	
S803	1-786-033-11	SWITCH, TACTILE (◀◀◀◀)		△	1-476-277-11	ADAPTOR, AC (AC-MZR55) (Hong Kong)	
S804	1-786-033-11	SWITCH, TACTILE (VOL-)		△	1-476-763-11	CHARGE UNIT (Hong Kong)	
S805	1-786-033-11	SWITCH, TACTILE (VOL+)		△	1-476-763-14	CHARGE UNIT (AEP,French)	
S806	1-786-033-11	SWITCH, TACTILE (GROUP)					
S808	1-762-078-11	SWITCH, SLIDE (HOLD)					
S809	1-762-498-11	SWITCH, PUSH (1 KEY)(OPEN/CLOSE DETECT)		△	1-476-857-11	ADAPTOR, AC (AC-ES305) (AEP,French)	
		< VIBRATOR >			1-528-299-61	BATTERY, NI-CD (NC-6WM)	
X601	1-795-002-11	VIBRATOR, CERAMIC 45.1584MHZ			3-008-521-01	CASE, BATTERY CHARGE	
*****							
		MISCELLANEOUS *****			3-220-749-01	CASE, CARRYING	
					3-231-629-11	MANUAL, INSTRUCTION (ENGLISH,CHINESE) (Hong Kong)	
					3-231-629-21	MANUAL, INSTRUCTION (ENGLISH,FRENCH) (AEP,French)	
					3-231-629-31	MANUAL, INSTRUCTION (GERMAN,ITALIAN) (AEP)	
51	1-680-453-11	MOTOR FLEXIBLE BOARD			3-231-629-41	MANUAL, INSTRUCTION (SPANISH,PORTUGUESE) (AEP)	
△62	X-3379-869-1	OPTICAL PICK-UP ASSY (LCX-4E)			3-231-629-51	MANUAL, INSTRUCTION (DUTCH,SWEDISH) (AEP)	
M901	8-835-706-01	MOTOR, DC SSM18A/C-NP (SPINDLE)			3-231-629-61	MANUAL, INSTRUCTION (FINNISH,RUSSIAN) (AEP)	
M902	1-763-399-11	MOTOR, DC (SLED)(WITH PULLY)					
					3-232-198-01	ATTACHMENT (STAND)(SILVER)	
					3-232-198-11	ATTACHMENT (STAND)(PINK)	
					3-232-198-21	ATTACHMENT (STAND)(BLUE)	
					3-232-198-31	ATTACHMENT (STAND)(YELLOW)	
					8-953-304-90	RECEIVER MDR-E805SP SET	

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

MEMO

# MZ-E501

**SONY**<sup>®</sup>

*AEP Model  
Hong Kong Model*

## **SERVICE MANUAL**

**Ver 1.2 2001.12**

### **SUPPLEMENT-1**

**Subject : 1. Schematic diagram and printed wiring  
board are changed.**

(ECN-DAB01214)

# MZ-E501

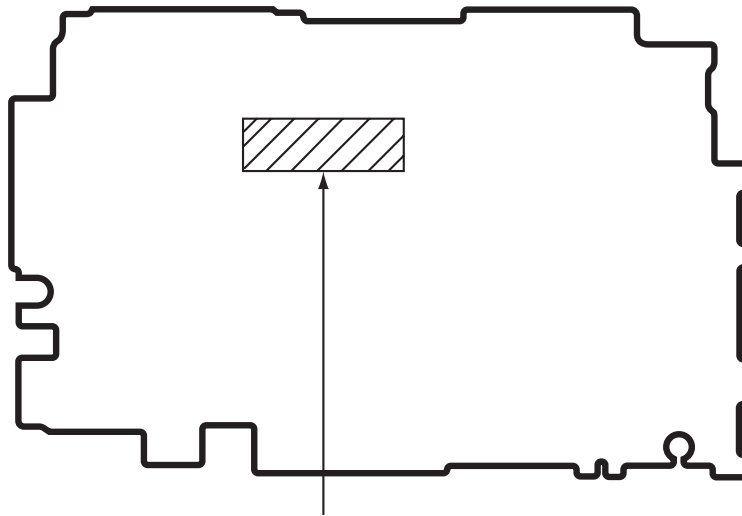
## How to distinguish the sets

Parts code of printed wiring board are changed.

Before change		After change	
Part No.	Description	Part No.	Description
1-681-868-11	MAIN BORD	1-681-868-12	MAIN BORD

Location of parts code on changed printed wiring board.

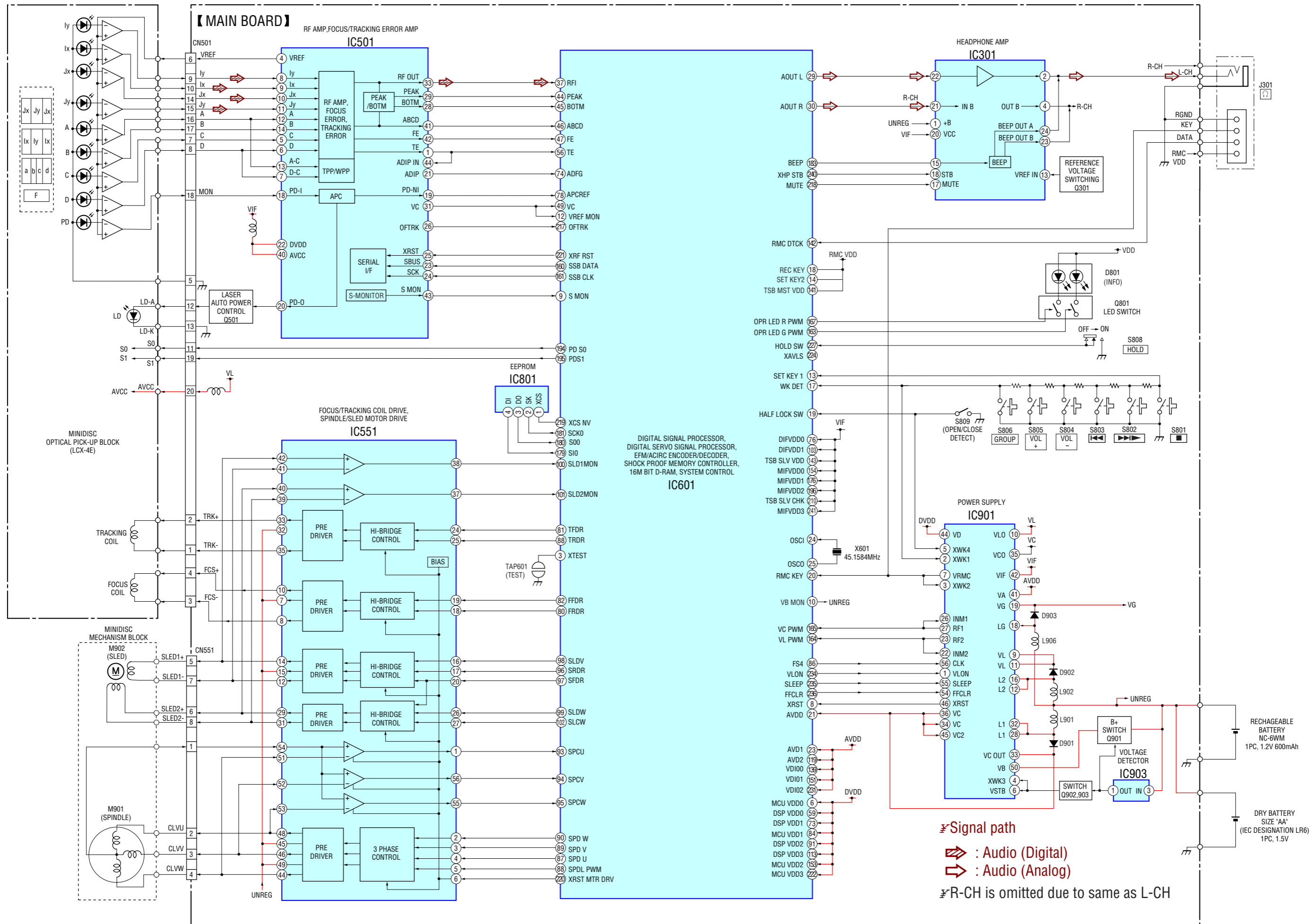
【MAIN BOARD】 (SIDE B)



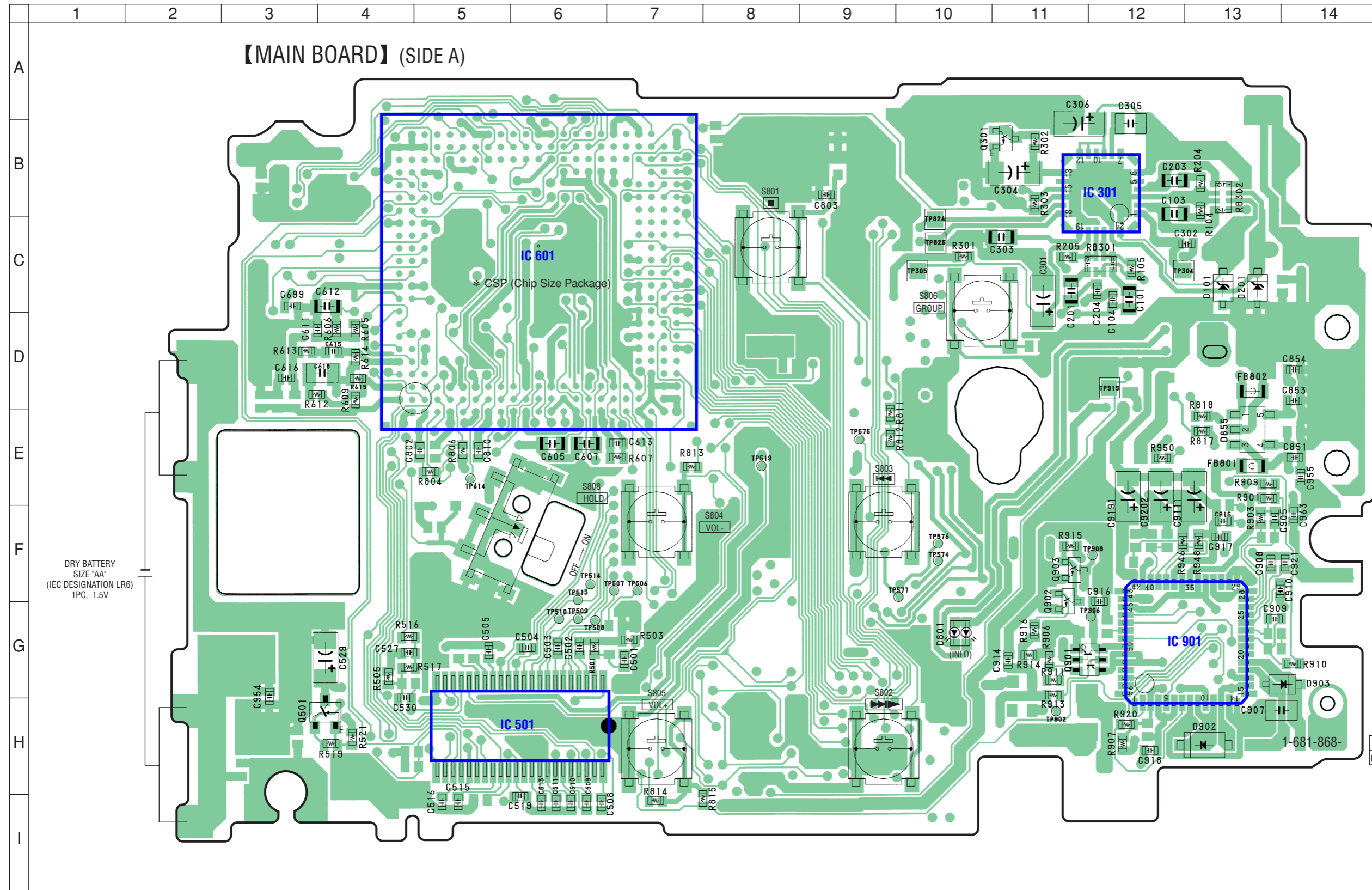
Before change: 1-681-868-11  
After change: 1-681-868-12

# SECTION 2 DIAGRAMS

## 2-1. BLOCK DIAGRAM



2-2. PRINTED WIRING BOARD – MAIN SECTION (SIDE A) –



• Semiconductor Location

Ref. No.	Location
D101	C-13
D201	C-13
D801	G-10
D855	E-13
D902	H-13
D903	G-14
IC301	B-12
IC501	H-5
IC601	C-6
IC901	G-12
Q301	B-11
Q501	H-3
Q901	G-11
Q902	F-11
Q903	F-11

DRY BATTERY  
SIZE "AA"  
(IEC DESIGNATION LR6)  
1PC, 1.5V

12  
(12)

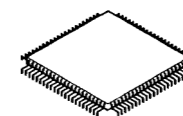
**Note on Printed Wiring Boards**

- : parts extracted from the component side.
- : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

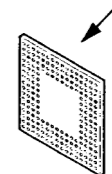
Caution:  
 Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.  
 Parts face side: Parts on the parts face side seen from the parts face are indicated.

- Main boards is four-layer printed 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



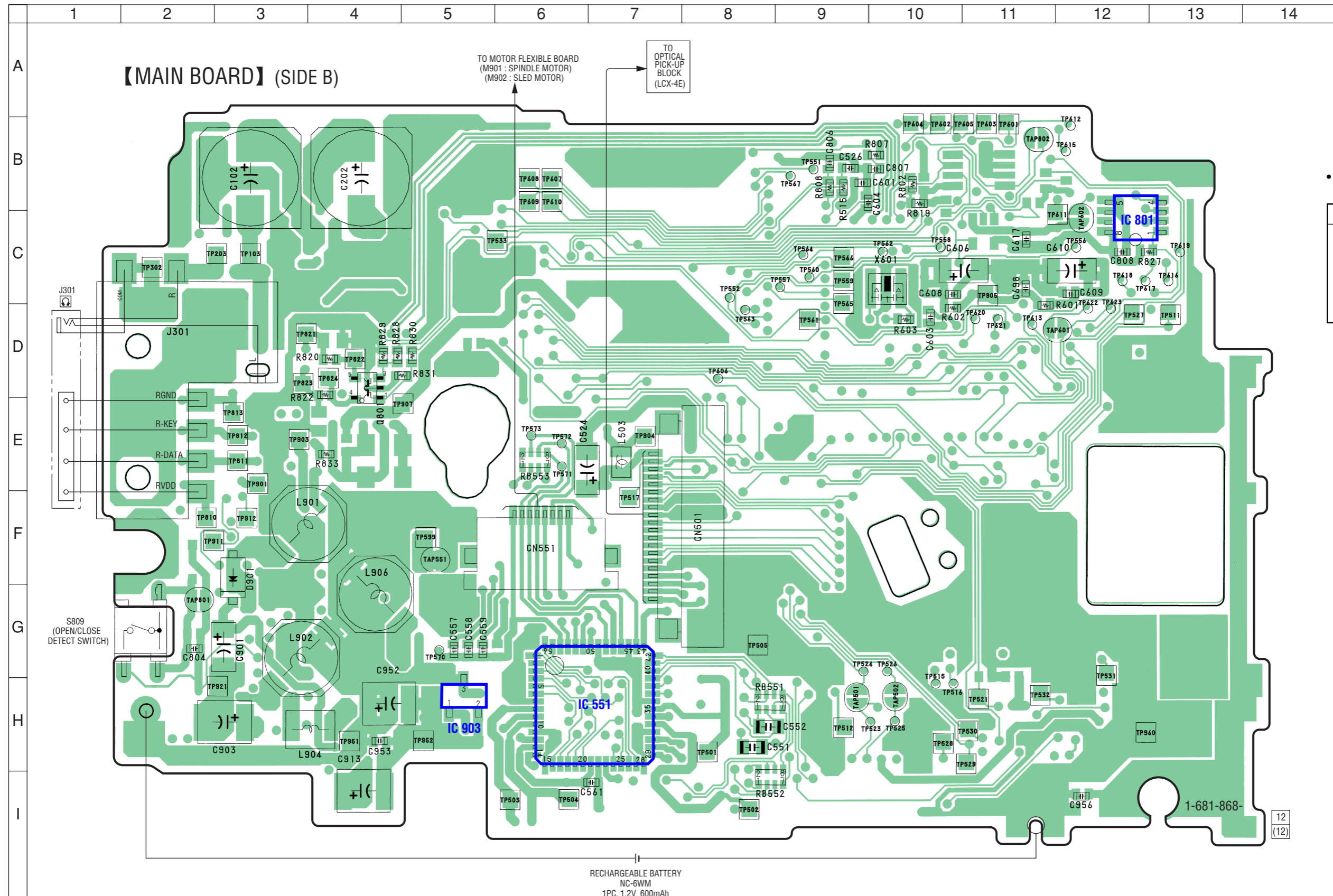
Lead layout of conventional IC



CSP (chip size package)



2-3. PRINTED WIRING BOARD – MAIN SECTION (SIDE B) –



• Semiconductor Location

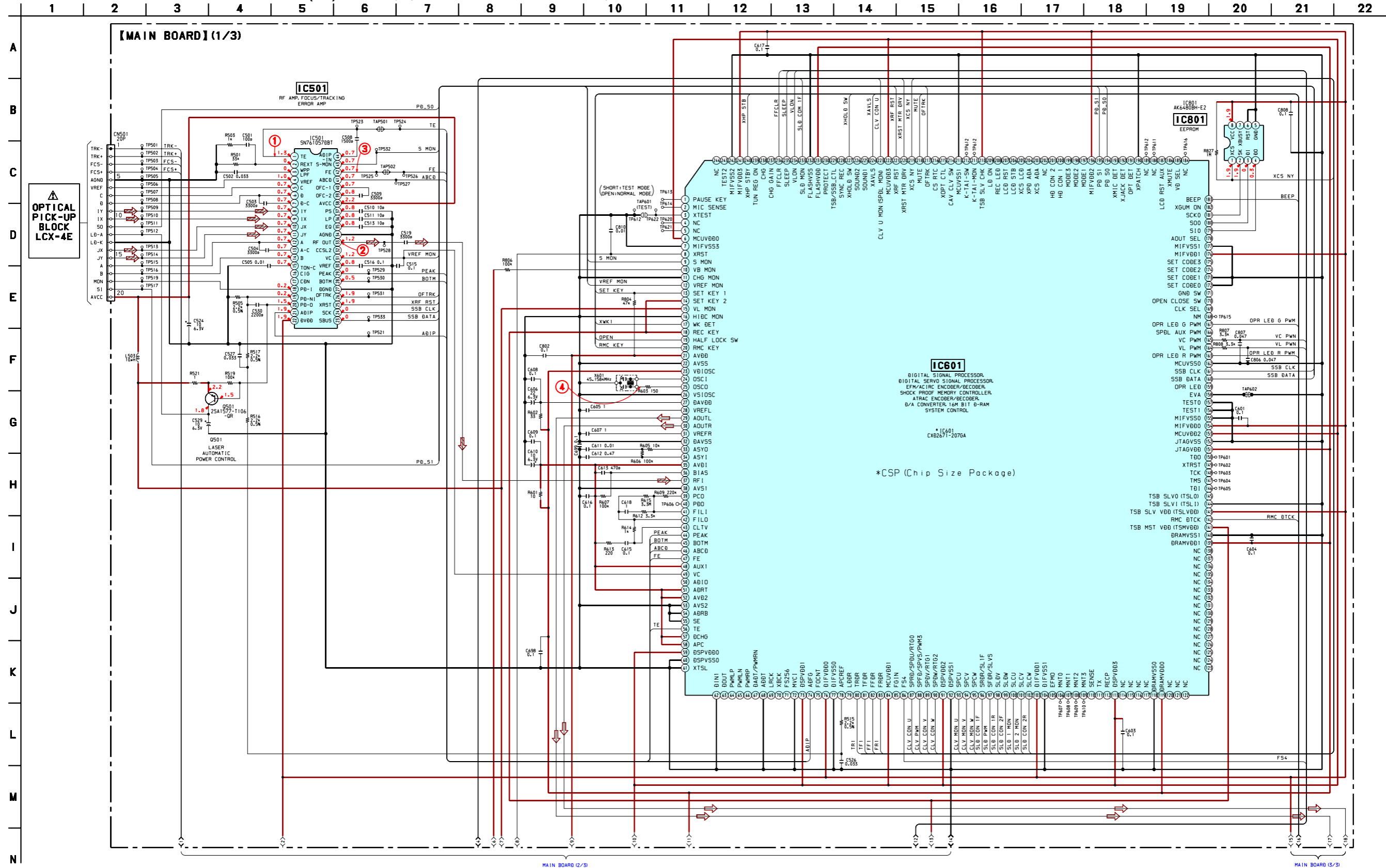
Ref. No.	Location
D901	F-3
IC551	H-6
IC801	C-12
IC903	H-5
Q801	D-4

**Note on Printed Wiring Boards**

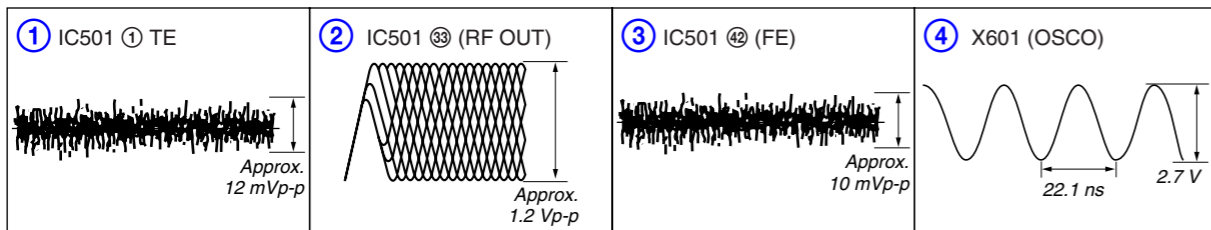
- : parts extracted from the component side.
- ◻ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

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

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



● WAVEFORMS



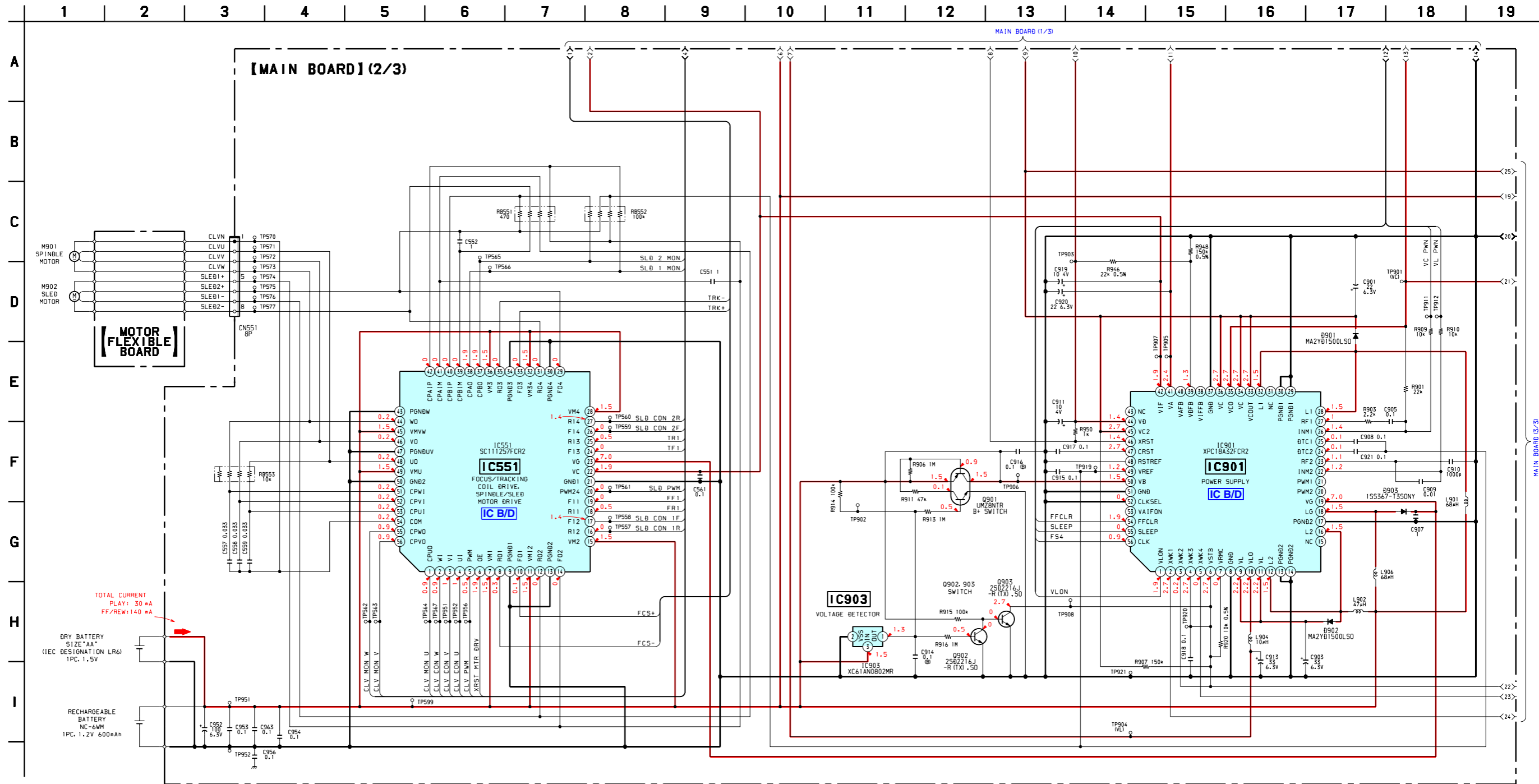
Note on Schematic Diagram

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

- 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.
- $\text{---}$  : Audio (Analog)
- $\text{---}$  : Audio (Digital)

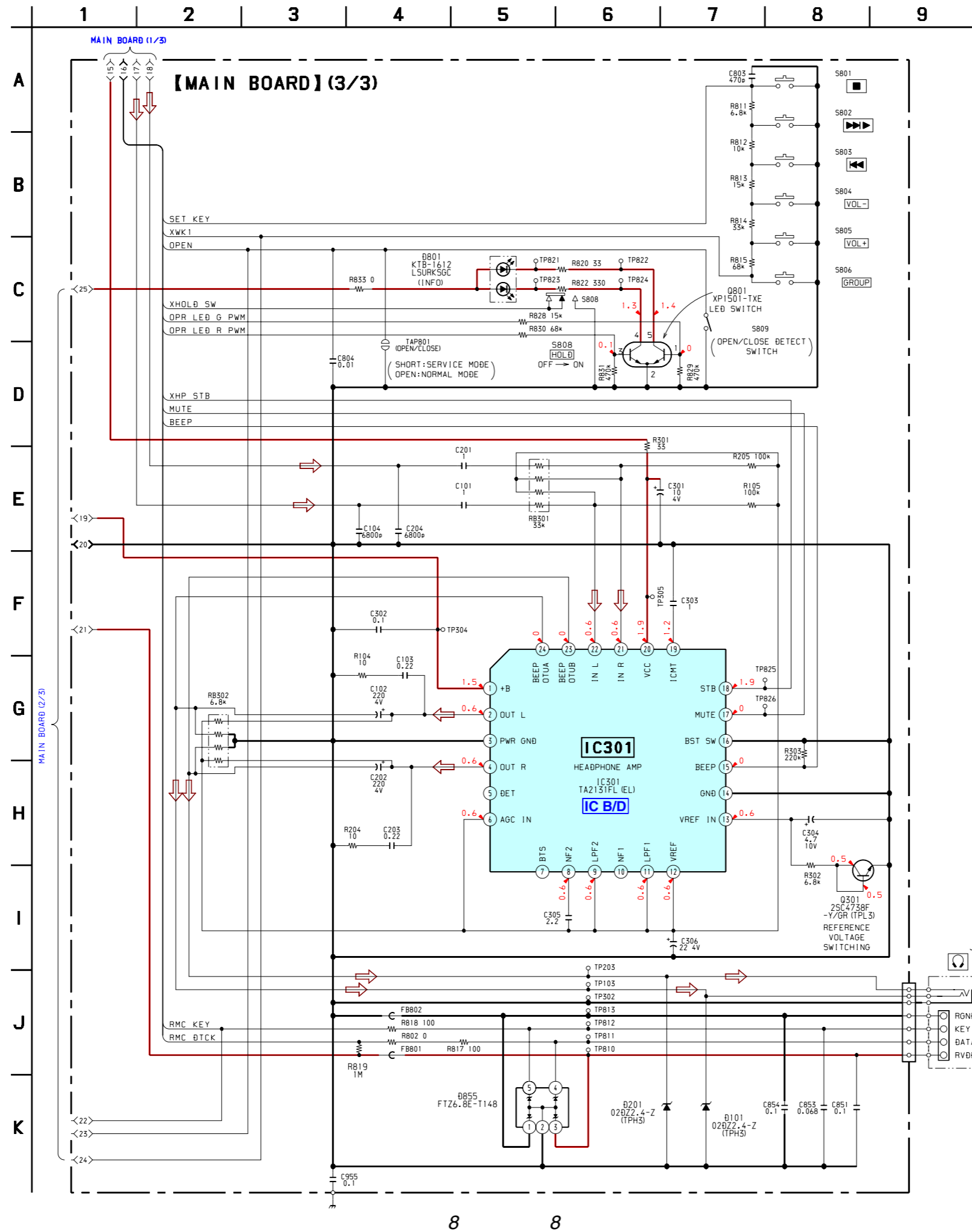
- \* Replacement of IC601 used in this set requires a special tool.
- The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different from that of conventional IC.

2-5. SCHEMATIC DIAGRAM – MAIN SECTION (2/3) – • See page 9, 10 for IC Block Diagrams.



**Note on Schematic Diagram**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\text{F}$  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{4}$  W or less unless otherwise 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 M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.

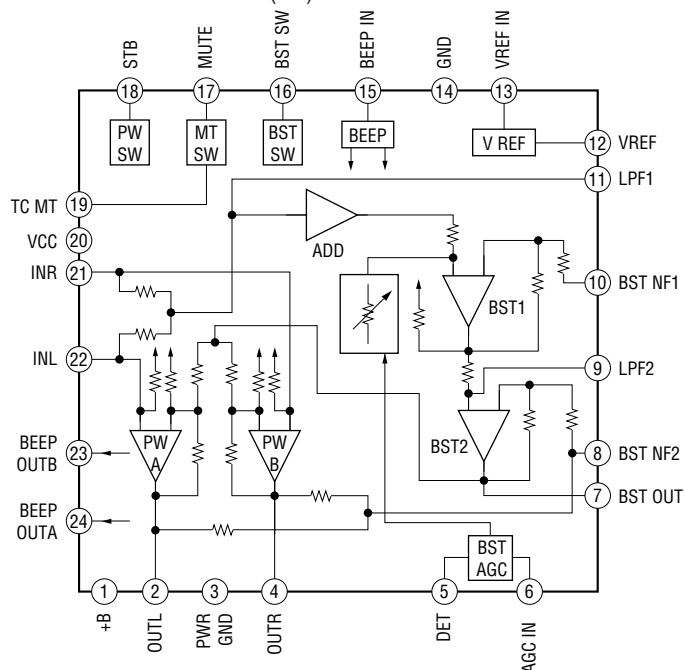


**Note on Schematic Diagram**

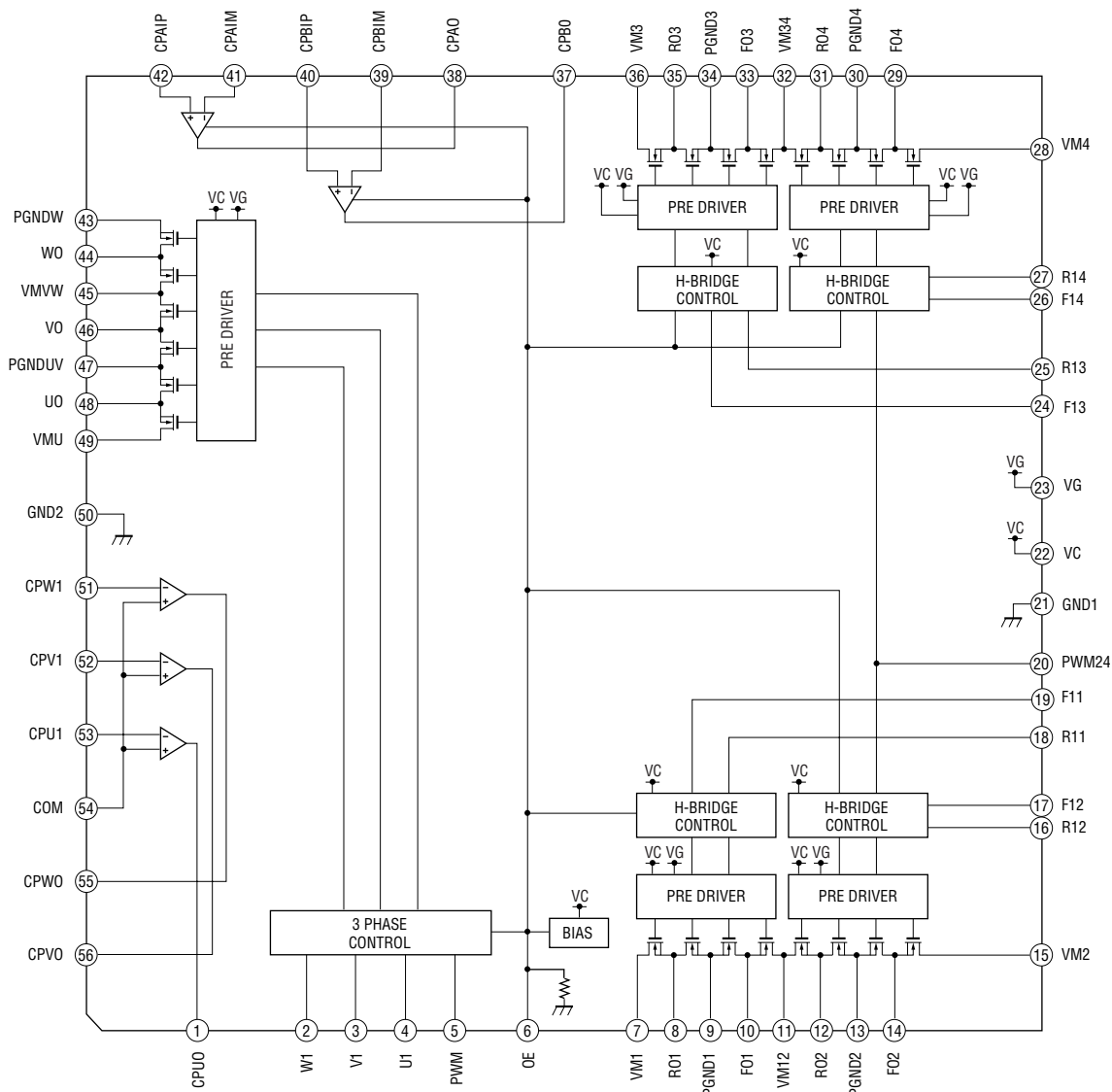
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$
- 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{ W}$  or less unless otherwise specified.
- : panel designation.
- — : B+ Line.
- Power 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 M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Signal path.  
⇒ : Audio (Analog)  
⇒ : Audio (Digital)

6-7. IC BLOCK DIAGRAMS

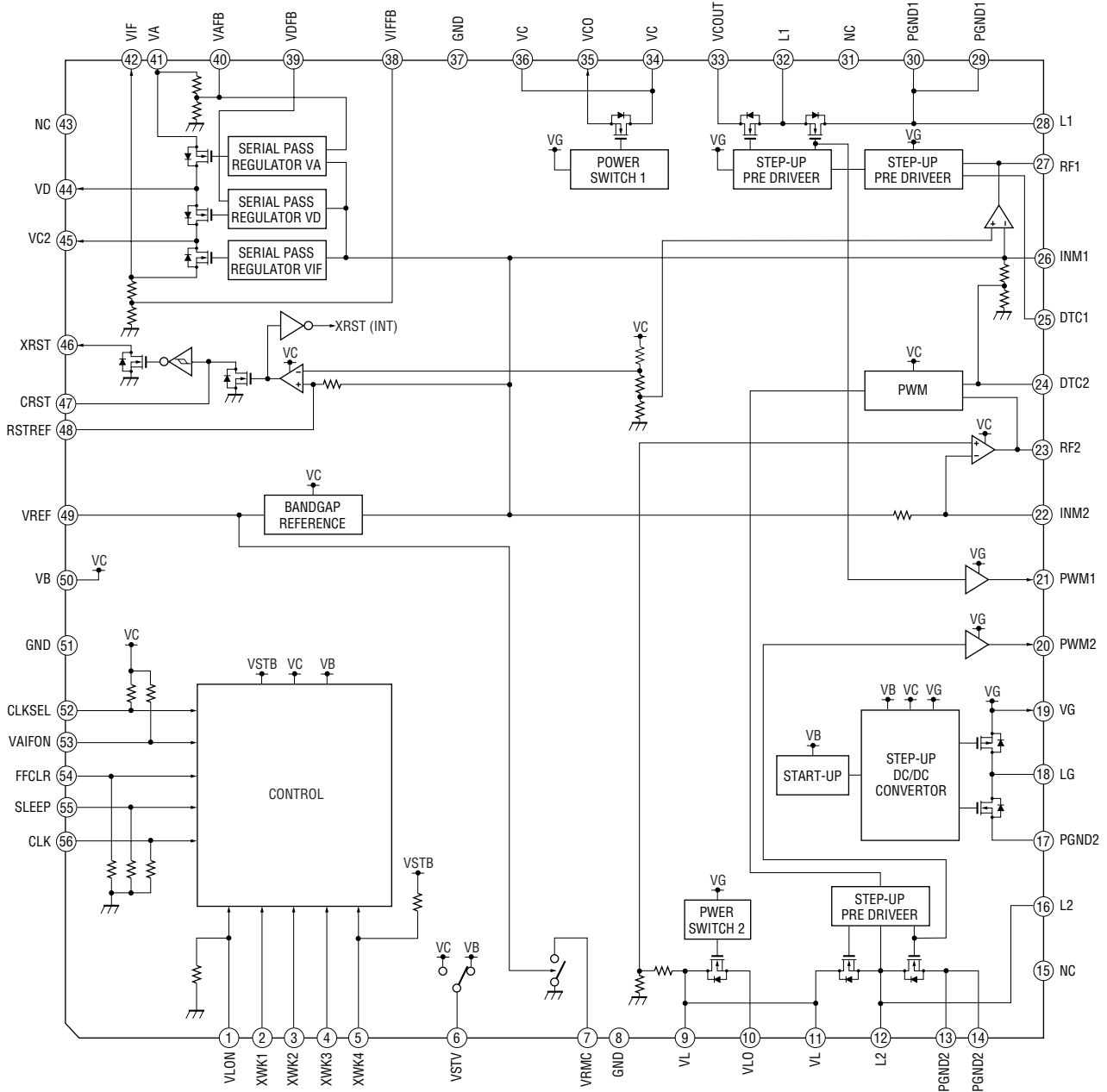
IC301 TA2131FL (EL)



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 pick-up detector
6	D	I	Signal (D) input from the optical pick-up detector
7	D-C	I	Signal (D) input from the optical pick-up detector (AC input)
8	IY	I	I-V converted RF signal (IY) input from the optical pick-up detector
9	IX	I	I-V converted RF signal (IX) input from the optical pick-up detector
10	JX	I	I-V converted RF signal (JX) input from the optical pick-up detector
11	JY	I	I-V converted RF signal (JY) input from the optical pick-up detector
12	A	I	Signal (A) input from the optical pick-up detector
13	A-C	I	Signal (A) input from the optical pick-up detector (AC input)
14	B	I	Signal (B) input from the optical pick-up 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 (Not used in this set)
17	CDN	I	Connect terminal to the external capacitor for the low-pass filter of CSL divider denominator (Not used in this set)
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 $\pm$ 3kHz) output to the system controller (IC601)
22	DVDD	—	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	—	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	—	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 $\pm$ 3kHz) input terminal, 3 times speed

## • IC601 CXD2671-207GA (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Description
1	OPR_LED_G_H	O	High intensity green LED control (open)
2	OPR_LED_G_L	O	Low intensity green LED control (open)
3	XTEST	I	Input terminal for the test mode detection
4	OPR_LED_R_H	O	High intensity red LED control (open)
5	OPR_LED_R_L	O	Low intensity red LED control (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/PWMRN	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 compare input (U)/2-phase drive compare input (1)
101	SLCV	I	Brushless sled motor 3-phase drive compare input (V)/2-phase drive compare input (2)
102	SLCW	—	Brushless sled motor 3-phase drive compare input (W)/2-phase compare 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 (Not used in this set)
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	OPR_LED_R_PWM	O	Operation LED (R) control PWM
164	VL PWM	—	PWM for the laser power supply voltage control
165	VC PWM	—	PWM for the system power supply voltage control
166	SPDL_AUX_PWM	O	Spindle auxiliary control PWM
167	OPR_LED_G_PWM	O	Operation LED (G) control PWM
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	O	Set code 0
173	SET CODE1	O	Set code 1
174	SET CODE2	O	Set code 2
175	SET CODE3	O	Set code 3
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	NC	—	Not used (open)
185	VD. SEL	O	Not used (open)
186	XMUTE	O	Not used (open)
187	LCD_RST_AUX	O	Not used (open)
188,189	NC	O	Not used (open)
190	X PATCH	I	Not used (connected to ground)
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)

Pin No.	Pin Name	I/O	Description
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)
210	TSB SLV CHK	I	TSB slave check
211	K-TAI_MON	I	Not used (open)
212	K-TAI_SW	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	XAVLS	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	TSB_SSB_CTL	O	TSB/SSB switching
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	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)

## SECTION 2 ELECTRICAL PARTS LIST

MAIN

**NOTE:**

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

- CAPACITORS:  
uF:  $\mu$ F
- RESISTORS  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS  
uH:  $\mu$ H

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

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

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-3021-503-A	MAIN BOARD, COMPLETE *****		C604	1-107-820-11	CERAMIC CHIP 0.1uF	16V
	4-225-074-03	TERMINAL BOARD		C605	1-115-156-11	CERAMIC CHIP 1uF	10V
		< CAPACITOR >		C606	1-119-750-11	TANTAL. CHIP 22uF	20.00% 6.3V
C101	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C607	1-115-156-11	CERAMIC CHIP 1uF	10V
C102	1-126-246-11	ELECT CHIP 220uF	20% 4V	C608	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C103	1-115-467-11	CERAMIC CHIP 0.22uF	10.00% 10V	C609	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C104	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V	C610	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V
C201	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C611	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C202	1-126-246-11	ELECT CHIP 220uF	20% 4V	C612	1-125-891-11	CERAMIC CHIP 0.47uF	10.00% 10V
C203	1-115-467-11	CERAMIC CHIP 0.22uF	10.00% 10V	C613	1-164-935-11	CERAMIC CHIP 470PF	10.00% 50V
C204	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V	C615	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C301	1-135-201-11	TANTALUM CHIP 10uF	20% 4V	C616	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C302	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C617	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C303	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C618	1-109-982-11	CERAMIC CHIP 1uF	10.00% 10V
C304	1-135-210-11	TANTALUM CHIP 4.7uF	20% 10V	C698	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C305	1-125-838-11	CERAMIC CHIP 2.2uF	10% 6.3V	C699	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C306	1-104-847-11	TANTAL. CHIP 22uF	20.00% 4V	C802	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C501	1-164-931-11	CERAMIC CHIP 100PF	10.00% 50V	C803	1-164-935-11	CERAMIC CHIP 470PF	10.00% 50V
C502	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C804	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C503	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C806	1-119-923-11	CERAMIC CHIP 0.047uF	10.00% 10V
C504	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C807	1-119-923-11	CERAMIC CHIP 0.047uF	10.00% 10V
C505	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V	C808	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C508	1-164-938-11	CERAMIC CHIP 0.0015uF	10.00% 50V	C810	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C509	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C851	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C510	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 50V	C853	1-164-942-11	CERAMIC CHIP 0.0068uF	10.00% 16V
C511	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 50V	C854	1-107-820-11	CERAMIC CHIP 0.1uF	16V
C513	1-164-850-11	CERAMIC CHIP 10PF	0.50PF 50V	C901	1-137-739-11	TANTALUM 22uF	20% 6.3V
C515	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C903	1-104-752-11	TANTAL. CHIP 33uF	20.00% 6.3V
C516	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V	C905	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C519	1-164-940-11	CERAMIC CHIP 0.0033uF	10.00% 16V	C907	1-109-982-11	CERAMIC CHIP 1uF	10.00% 10V
C524	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V	C908	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C526	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C909	1-164-943-11	CERAMIC CHIP 0.01uF	10.00% 16V
C527	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C910	1-164-937-11	CERAMIC CHIP 0.001uF	10.00% 50V
C529	1-135-259-11	TANTAL. CHIP 10uF	20.00% 6.3V	C911	1-135-201-11	TANTALUM CHIP 10uF	20% 4V
C530	1-164-939-11	CERAMIC CHIP 0.0022uF	10.00% 50V	C913	1-104-752-11	TANTAL. CHIP 33uF	20.00% 6.3V
C551	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C914	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C552	1-125-837-11	CERAMIC CHIP 1uF	10% 6.3V	C915	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C557	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C916	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C558	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C917	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C559	1-127-772-11	CERAMIC CHIP 33000PF	10% 10V	C918	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
C561	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C919	1-135-201-11	TANTALUM CHIP 10uF	20% 4V
C601	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C920	1-119-750-11	TANTAL. CHIP 22UF	20.00% 6.3V
C603	1-107-820-11	CERAMIC CHIP 0.1uF	16V	C921	1-125-777-11	CERAMIC CHIP 0.1uF	10.00% 10V
				C952	1-128-964-11	TANTAL. CHIP 100uF	20% 6.3V
				C953	1-107-820-11	CERAMIC CHIP 0.1uF	16V

# MZ-E501

## MAIN

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C954	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R302	1-218-963-11	RES-CHIP 6.8K	5% 1/16W
C955	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R303	1-218-981-11	RES-CHIP 220K	5% 1/16W
C956	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R501	1-218-971-11	RES-CHIP 33K	5% 1/16W
C963	1-107-820-11	CERAMIC CHIP 0.1uF	16V	R503	1-218-953-11	RES-CHIP 1K	5% 1/16W
		< CONNECTOR >		R505	1-208-691-11	METAL CHIP 2.2K	0.5% 1/16W
* CN501	1-778-168-11	CONNECTOR, FFC/FPC (ZIF) 20P		R515	1-208-691-11	METAL CHIP 2.2K	0.5% 1/16W
* CN551	1-793-124-21	CONNECTOR, FPC (ZIP) 8P		R516	1-208-691-11	METAL CHIP 2.2K	0.5% 1/16W
		< DIODE >		R517	1-208-691-11	METAL CHIP 2.2K	0.5% 1/16W
D101	8-719-056-72	DIODE 02DZ2.4-Z(TPH3)		R519	1-218-977-11	RES-CHIP 100K	5% 1/16W
D201	8-719-056-72	DIODE 02DZ2.4-Z(TPH3)		R521	1-242-967-11	RES-CHIP 1	5% 1/16W
D801	8-719-085-54	DIODE KPTB-1612LSURKSGC (INFO)		R601	1-208-635-11	RES-CHIP 10	5% 1/16W
D855	8-719-066-17	DIODE FTZ6.8E-T148		R602	1-218-935-11	RES-CHIP 33	5% 1/16W
D855	8-719-068-83	DIODE MAZL068D0LS0-TX/L		R603	1-218-943-11	RES-CHIP 150	5% 1/16W
D901	8-719-081-33	DIODE MA2YD1500LS0		R605	1-218-965-11	RES-CHIP 10K	5% 1/16W
D902	8-719-081-33	DIODE MA2YD1500LS0		R606	1-218-977-11	RES-CHIP 100K	5% 1/16W
D903	8-719-049-09	DIODE 1SS367-T3SONY		R607	1-218-977-11	RES-CHIP 100K	5% 1/16W
		< FERRITE BEAD >		R609	1-218-981-11	RES-CHIP 220K	5% 1/16W
FB801	1-414-228-11	FERRITE 0uH		R612	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
FB802	1-414-228-11	FERRITE 0uH		R613	1-218-945-11	RES-CHIP 220	5% 1/16W
		< IC >		R614	1-218-953-11	RES-CHIP 1K	5% 1/16W
IC301	8-759-598-15	IC TA2131FL(EL)		R615	1-202-974-11	RES-CHIP 3.3M	5% 1/16W
IC501	8-759-689-67	IC SN761057DBT		R802	1-218-990-11	SHORT 0	
IC551	8-759-698-62	IC SC111257FCR2		R804	1-218-973-11	RES-CHIP 47K	5% 1/16W
@ IC601	8-752-413-15	IC CXD2671-207GA		R806	1-218-977-11	RES-CHIP 100K	5% 1/16W
IC801	8-759-566-18	IC AK6480BH-E2		R807	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
IC901	8-759-698-61	IC XPC18A32FCR2		R808	1-218-959-11	RES-CHIP 3.3K	5% 1/16W
IC903	8-759-186-89	IC XC61AN0802MR		R811	1-218-963-11	RES-CHIP 6.8K	5% 1/16W
		< JACK >		R812	1-218-965-11	RES-CHIP 10K	5% 1/16W
J301	1-793-288-81	JACK (♁)		R813	1-218-967-11	RES-CHIP 15K	5% 1/16W
		< COIL >		R814	1-218-971-11	RES-CHIP 33K	5% 1/16W
L503	1-469-570-11	INDUCTOR 10uH		R815	1-218-975-11	RES-CHIP 68K	5% 1/16W
L901	1-419-258-11	INDUCTOR 68uH		R817	1-218-941-11	RES-CHIP 100	5% 1/16W
L902	1-419-646-11	INDUCTOR 47uH		R818	1-218-941-11	RES-CHIP 100	5% 1/16W
L904	1-414-398-11	INDUCTOR 10uH		R819	1-218-989-11	RES-CHIP 1M	5% 1/16W
L906	1-419-258-11	INDUCTOR 68uH		R820	1-218-935-11	RES-CHIP 33	5% 1/16W
		< TRANSISTOR >		R822	1-218-947-11	RES-CHIP 330	5% 1/16W
Q301	8-729-037-52	TRANSISTOR 2SC4738F-Y/GR(TPL3)		R827	1-218-989-11	RES-CHIP 1M	5% 1/16W
Q501	8-729-922-10	TRANSISTOR 2SA1577-T106-QR		R828	1-218-967-11	RES-CHIP 15K	5% 1/16W
Q801	8-729-429-44	TRANSISTOR XP1501-TXE		R829	1-218-985-11	RES-CHIP 470K	5% 1/16W
Q901	6-550-075-01	TRANSISTOR UMZ8NTR		R830	1-218-975-11	RES-CHIP 68K	5% 1/16W
Q902	8-729-037-92	TRANSISTOR 2SD2216J-R(TX).SO		R831	1-218-985-11	RES-CHIP 470K	5% 1/16W
Q903	8-729-037-92	TRANSISTOR 2SD2216J-R(TX).SO		R833	1-218-990-11	SHORT 0	
		< RESISTOR >		R901	1-218-969-11	RES-CHIP 22K	5% 1/16W
R104	1-208-635-11	RES-CHIP 10	5% 1/16W	R903	1-218-957-11	RES-CHIP 2.2K	5% 1/16W
R105	1-218-977-11	RES-CHIP 100K	5% 1/16W	R906	1-218-989-11	RES-CHIP 1M	5% 1/16W
R204	1-208-635-11	RES-CHIP 10	5% 1/16W	R907	1-218-979-11	RES-CHIP 150K	5% 1/16W
R205	1-218-977-11	RES-CHIP 100K	5% 1/16W	R909	1-218-965-11	RES-CHIP 10K	5% 1/16W
R301	1-218-935-11	RES-CHIP 33	5% 1/16W	R910	1-218-965-11	RES-CHIP 10K	5% 1/16W
				R911	1-218-973-11	RES-CHIP 47K	5% 1/16W
				R913	1-218-989-11	RES-CHIP 1M	5% 1/16W
				R914	1-218-977-11	RES-CHIP 100K	5% 1/16W
				R915	1-218-977-11	RES-CHIP 100K	5% 1/16W
				R916	1-218-989-11	RES-CHIP 1M	5% 1/16W
				R920	1-208-707-11	METAL CHIP 10K	0.5% 1/16W
				R946	1-208-715-11	METAL CHIP 22K	0.5% 1/16W
				R948	1-208-939-11	METAL CHIP 150K	0.5% 1/16W
				R950	1-218-953-11	RES-CHIP 1K	5% 1/16W

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
< COMPOSITION CIRCUIT BLOCK >							
RB301	1-233-970-11	RES, NETWORK (CHIP TYPE) 33K					
RB302	1-233-966-11	RES, NETWORK (CHIP TYPE) 6.8K					
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 (GROUP)					
S808	1-762-078-11	SWITCH, SLIDE (HOLD)					
S809	1-762-498-21	SWITCH, PUSH (1 KEY) (OPEN/CLOSE DETECT)					
< VIBRATOR >							
X601	1-795-002-11	VIBRATOR, CERAMIC 45.1584MHz					
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