

# MXD-D3

## SERVICE MANUAL

**Self Diagnosis**  
Supported model

US Model  
Canadian Model  
AEP Model  
UK Model  
E Model  
Chinese Model



Photo: Gold

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CD Section	Model Name Using Similar Mechanism	NEW
	CD Mechanism Type	CDM14H-5TBD26B
	Base Unit Name	BU-5TBD26B
	Optical Pick-up Name	KSS-213BH/Z-NP
MD Section	Model Name Using Similar Mechanism	NEW
	MD Mechanism Type	MDM-5X2B
	Base Unit Name	MBU-5X2B
	Optical Pick-up Name	KMS-262A/J1N

### SPECIFICATIONS

#### CD player section

<b>System</b>	Compact Disc digital audio system
<b>Laser</b>	Semiconductor laser ( $\lambda = 780 \text{ nm}$ ) Emission duration: continuous
<b>Laser output</b>	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.
<b>Frequency response</b>	5 to 20,000 Hz $\pm 0.5 \text{ dB}$
<b>Signal-to-noise ratio</b>	More than 98 dB
<b>Wow and flutter</b>	Below measurable limit

#### MD deck section

<b>System</b>	MiniDisc digital audio system
<b>Disc</b>	MiniDisc
<b>Laser</b>	Semiconductor laser ( $\lambda = 780 \text{ nm}$ ) Emission duration: continuous
<b>Laser output</b>	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.
<b>Laser diode properties</b>	Material: GaAlAs
<b>Revolutions (CLV)</b>	800 rpm to 1,800 rpm
<b>Error correction</b>	Advanced Cross Interleave Reed Solomon Code (ACIRC)
<b>Sampling frequency</b>	44.1 kHz
<b>Coding</b>	Adaptive Transform Acoustic Coding (ATRAC)
<b>Modulation system</b>	EFM (Eight-to-Fourteen Modulation)
<b>Number of channels</b>	2 stereo channels
<b>Frequency response</b>	5 to 20,000 Hz $\pm 0.5 \text{ dB}$
<b>Signal-to-noise ratio</b>	Over 98 dB during playback
<b>Wow and flutter</b>	Below measurable limit

#### Inputs

	Jack type	Input impedance	Rated input	Minimum input
<b>LINE (ANALOG) IN</b>	Phono jacks	47 kilohms	500 mVrms	125 mVrms
<b>DIGITAL OPTICAL IN</b>	Square optical connector jack	Optical wave length: 660 nm	—	—

#### Outputs

	Jack type	Rated output	Load impedance
<b>PHONES</b>	Stereo phone jack	10 mW	32 ohms
<b>LINE (ANALOG) OUT</b>	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms

— Continued on next page —



## COMPACT DISC MINIDISC DECK

# SONY®

General	
<b>Power requirements</b>	
Where purchased	Power requirements
U.S.A. and Canada	120 V AC, 60 Hz
Europe	220 - 230 V AC, 50/60 Hz
Certain countries in Asia	220 - 240 V AC, 50/60 Hz
Other countries	110 - 120 or 220 - 240 V AC selectable, 50/60 Hz
<b>Power consumption</b>	
Where purchased	Power consumption
U.S.A. and Canada	20 W (less than 1 W at standby)
Europe	20 W (less than 1 W at standby)
Other countries	22 W (less than 1.2 W at standby)

Dimensions (approx.) (w/h/d) incl. projecting parts and controls  
430 × 120 × 290 mm

Mass (approx.) 4.7 kg

#### Supplied accessories

- Audio connecting cords (2)
- Optical cable (1)
- Remote commander (remote) RM-D37M (1)
- Sony R6 (size-AA) batteries (2)
- Power plug adaptor (1) (Singaporean model only)

Design and specifications are subject to change without notice.

## SELF-DIAGNOSIS FUNCTION

The self-diagnosis function consists of error codes for customers which are displayed automatically when errors occur, and error codes which show the error history in the test mode during servicing. For details on how to view error codes for the customer, refer to the following box in the instruction manual. For details on how to check error codes during servicing, refer to the following "Procedure for using the Self-Diagnosis Function (Error History Display Mode)".

### Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three-digit display (a combination of a letter and figures) and the corresponding message, so you can check the deck's condition.

If such a display appears, check the following table in order to resolve the problem.

Should any problem persist, consult your nearest Sony dealer.

Three-digit display/Message	Cause/Remedy
C11/Protected!!	The inserted MD is record-protected. ➔ Take out the MD, and close the record-protect tab (page 9).
C12/Cannot Copy	An attempt was made to play a disc that is not compatible with this deck (CD-ROM, MD data disc, etc.). ➔ Replace the disc.
C13/REC Error!!	The recording was not made properly. ➔ Set the deck in a stable place, and repeat the recording procedure.  The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➔ Replace the disc, and repeat the recording procedure.
C13/Disc Error!!	The deck could not read the TOC of the MD properly. ➔ Take out the MD, and insert it again.
C13/Read Error	The deck could not read the TOC of the MD properly. ➔ Eject the disc, then insert it again.
C14/TOC Error!!	The deck could not read the TOC of the MD properly. ➔ Insert another disc. ➔ If possible, erase all tracks on the MD using the All Erase Function on page 27.
C41/Cannot Copy	The digitally dubbed material cannot be recorded digitally (page 39).
C71/Din Unlock ("C71" alternates with "Din Unlock" in the display.)	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material.  While recording from a digital component connected through the DIGITAL OPTICAL IN connector, the digital connecting cable was unplugged or the digital component turned off. ➔ Connect the cable or turn the digital component back on.




### PROCEDURE FOR USING THE SELF-DIAGNOSIS FUNCTION (ERROR HISTORY DISPLAY MODE)

Note: Perform the self-diagnosis function in the "error history display mode" in the test mode. The following describes the least required procedure. Be careful not to enter other modes by mistake. If you set other modes accidentally, press the MENU/NO button to exit the mode.

1. Press the [CD], [CLEAR] (CD), [MD] and [CLEAR] (MD) buttons at the same time.
2. Press the [◀◀ AMS ▶▶] (MD) knob and [MD] button to display "<0> To Normal".
3. Turn the [◀◀ AMS ▶▶] (MD) knob and when "<5> MD Test" is displayed, press the [◀◀ AMS ▶▶] (MD) knob.
4. Turn the [◀◀ AMS ▶▶] (MD) knob and when "[Service]" is displayed, press the [YES] button.
5. Turn the [◀◀ AMS ▶▶] (MD) knob to display "ERR DP MODE".
6. Press the [YES] button to set the error history mode and displays "total rec".
7. Select the contents to be displayed or executed using the [◀◀ AMS ▶▶] (MD) knob.
8. Press the [◀◀ AMS ▶▶] (MD) knob to display or execute the contents selected.
9. Press the [◀◀ AMS ▶▶] (MD) knob another time returns to step 6.
10. Press the [MENU/NO] button to display "ERROR DP MODE" and release the error history mode.
11. To release the test mode, press the [I/O] button to turn the power OFF.

## ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

### Selecting the Test Mode

Display	Details of History
total rec	Displays the recording time. Displayed as “r□□□□□h”. The displayed time is the total time the laser is set to the high power state. This is about 1/4 of the actual recording time. The time is displayed in decimal digits from 0h to 65535h.
total play	Displays the play time. Displayed as “p□□□□□h”. The time displayed is the total actual play time. Pauses are not counted. The time is displayed in decimal digits from 0h to 65535h.
retry err	Displays the total number of retries during recording and number of retry errors during play. Displayed as “r□□ p□□”. “r” indicates the retries during recording while “p” indicates the retry errors during play. The number of retries and retry errors are displayed in hexadecimal digits from 00 to FF.
total err	Displays the total number of errors. Displayed as “total □□”. The number of errors is displayed in hexadecimal digits from 00 to FF.
err history	Displays the 10 latest errors. Displayed as “0□ E@@”. □ indicates the history number. The smaller the number, the more recent is the error. (00 is the latest). @@ indicates the error code. Refer to the following table for the details. The error history can be switched by turning the  (MD) knob.
er refresh	Mode which erases the “retry err”, “total err”, and “err history” histories. When returning the unit to the customer after completing repairs, perform this to erase the past error history. After pressing the  (MD) knob and “er refresh?” is displayed, press the <b>YES</b> button to erase the history. “Complete!” will be displayed momentarily. Be sure to check the following when this mode has been executed. <ul style="list-style-type: none"> <li>• The data has been erased.</li> <li>• The mechanism operates normally when recording and play are performed.</li> </ul>
tm refresh	Mode which erases the “total rec” and “total play” histories. These histories serve as approximate indications of when to replace the optical pick-up. If the optical pickup has been replaced, perform this operation and erase the history. After pressing the  (MD) knob and “tm refresh?” is displayed, press the <b>YES</b> button to erase the history. “Complete!” will be displayed momentarily. Be sure to check the following when this mode has been executed. <ul style="list-style-type: none"> <li>• The data has been erased.</li> <li>• The mechanism operates normally when recording and play are performed.</li> </ul>

**Table of Error Codes**

Error Code	Details of Error	Error Code	Details of Error
E00	No error	E05	FOK has deviated
E01	Disc error. PTOC cannot be read (DISC ejected)	E06	Cannot focus (Servo has deviated)
		E07	Recording retry
E02	Disc error. UTOC error (DISC not ejected)	E08	Recording retry error
		E09	Playback retry error (Access error)
E03	Loading error		
E04	Address cannot be read (Servo has deviated)	E0A	Playback retry error (C2 error)

# SECTION 1 SERVICING NOTES

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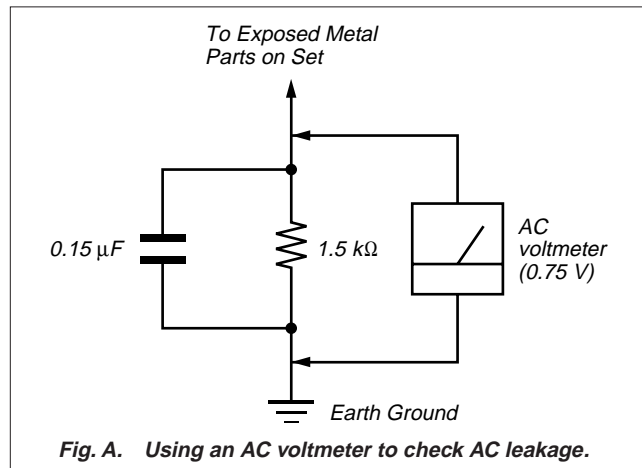
### SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer: Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes.). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



### 与安全有关的零部件须知

在原理图上用阴影及 △ 标记来识别的零部件在安全操作上是具有关键性的。这些零部件要用本手册中所示的部件号对应的索尼零部件进行更换。

在安全操作上具有关键性的电路调整与索尼公司出版的维修手册完全一致。在更换关键零部件时或怀疑动作失常时，请进行这些调整操作。

### SAFETY-RELATED COMPONENT WARNING!!

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

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

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

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.



This caution label is located inside the unit.

#### CAUTION

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

#### 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

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

#### LASER DIODE AND FOCUS SEARCH OPERATION CHECK

Carry out the "S curve check" in "CD section adjustment" and check that the S curve waveforms is output three times.

#### Note:

Be sure to connect all wires (including FFC) in the MD section before applying power or ICs may be damaged.

#### CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Discard used batteries according to the manufacturer's instructions.

#### ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

#### ADVARSEL

Ekspløsjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

#### VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt gällande föreskrifter.

#### VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

#### 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.

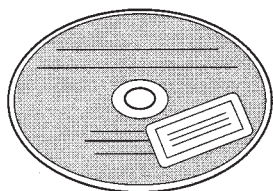
#### Notes on chip component replacement

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

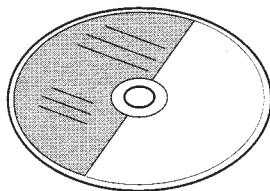


## Note on High-Speed CD Synchro-Recording

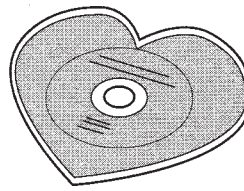
With the following kinds of CDs, you may experience a reading failure during recording or noise when recorded to an MD:



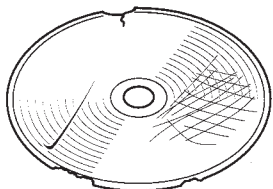
CDs with adhesive labels attached to them



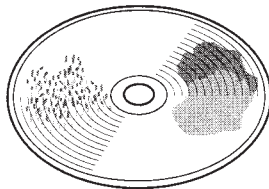
CDs with printed text concentrated on one side only



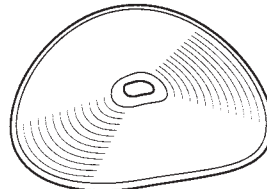
Irregularly shaped CDs (for example, heart- or star-shaped)



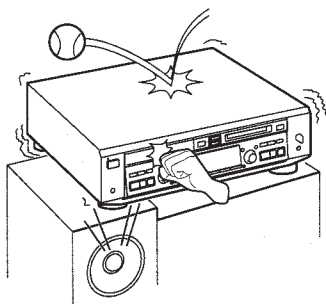
Old or scratched CDs



Dirty CDs



Warped CDs



If the following occurs during recording, a reading error may occur or noise may be produced in the recorded results:

- The CD tray or other part of the deck is bumped.
- The deck is placed on an uneven or soft surface.
- The deck is located near a speaker, door, or other source of vibration.



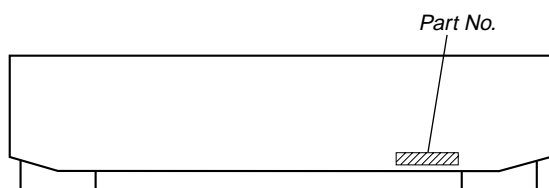
### If " - Retry - " flashes in the display

A reading failure has occurred, and the deck is trying to read the data again.

- If the retry was successful, the deck continues with High-Speed CD Synchro-Recording.
- If the condition of the inserted CD or the deck is poor, and retry fails, High-Speed CD Synchro-Recording is disabled. In this case, the deck automatically starts recording in normal CD Synchro-Recording. Note that you cannot monitor the recording at this time.

## MODEL IDENTIFICATION

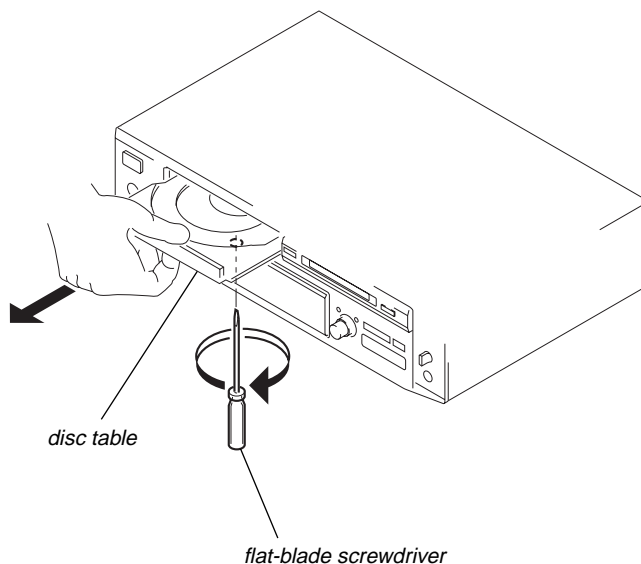
— BACK PANEL —



Model	Part No.
AEP, UK models	4-220-708-0□
Canadian model	4-220-708-1□
Singapore model	4-220-708-3□
US model	4-220-708-4□
Chinese model	4-220-708-5□

## HOW TO OPEN THE DISC TABLE WHEN POWER SWITCH TURNS OFF.

In removing the front panel with the power not supplied, insert a flat-blade screwdriver into a hole at the bottom of loading section and rotate it counterclockwise. Then, draw out the disc table.

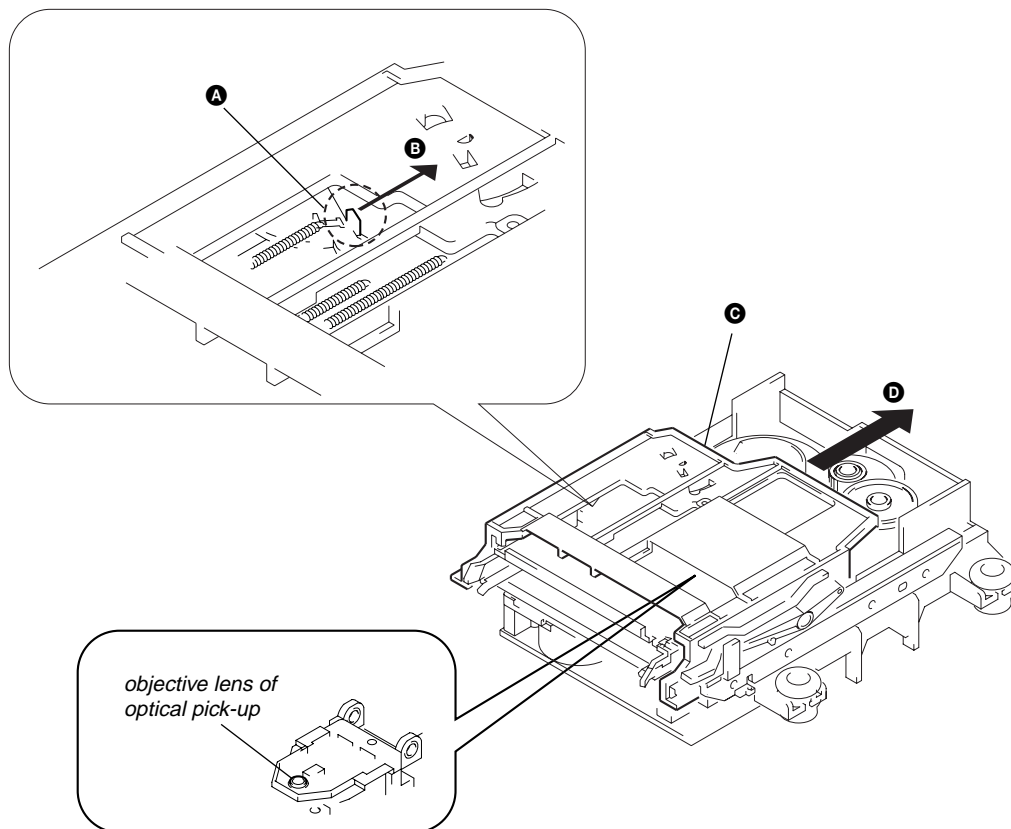


## CLEANING OBJECTIVE LENS OF OPTICAL PICK-UP IN MD

- In cleaning the objective lens of optical pick-up, move the mechanism deck by the following method.

### Method:

1. Eject the disc, if loaded.
2. Disconnect the power cord from the socket to shut off the power supply.
3. Move the part **C** toward the direction **D**, while shifting the pawl in section **A** toward **B** using tweezers, etc.
4. Moving the part **C** freely, clean the objective lens at the position easy for cleaning.

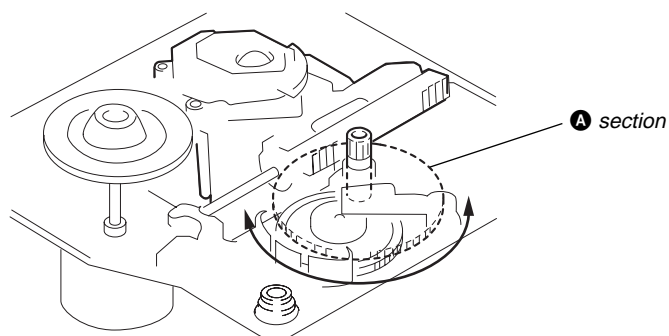


## CLEANING OBJECTIVE LENS OF OPTICAL PICK-UP IN CD

- In cleaning the objective lens of optical pick-up, move the mechanism deck by the following method.

### Method:

1. Eject the disc, if loaded.
2. Disconnect the power cord from the socket to shut off the power supply.
3. Rotating the gear in section **A** by your fingers clean the objective lens at the position easy for cleaning.



## JIG FOR CHECKING BD (MD) BOARD WAVEFORM

The special jig (J-2501-149-A) is useful for checking the waveform of the BD (MD) board. The names of terminals and the checking items to be performed are shown as follows.

GND : Ground

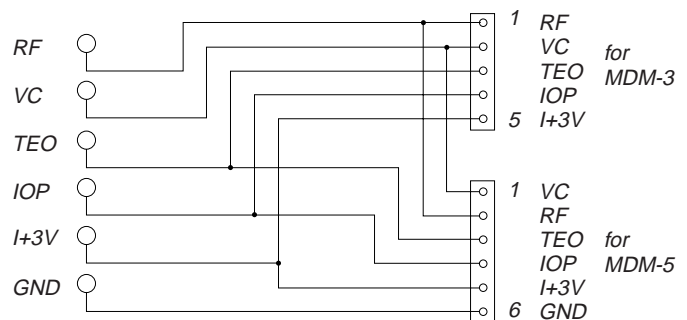
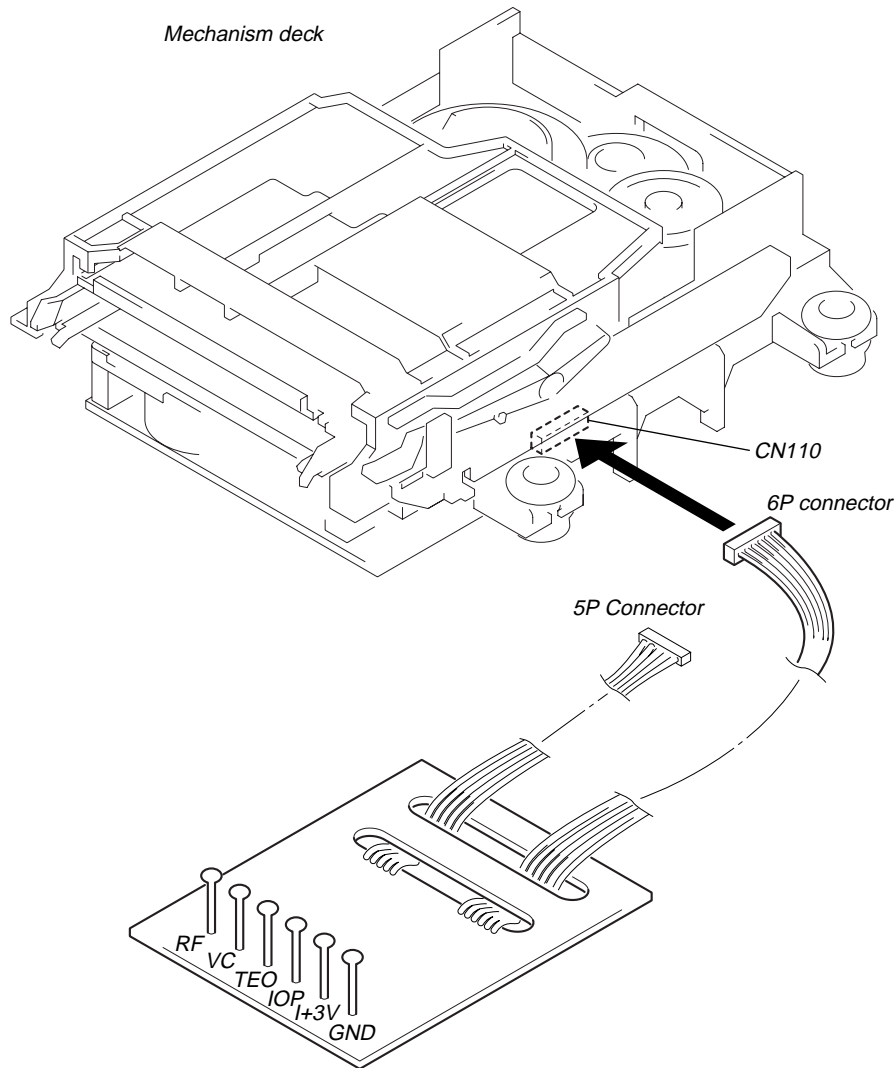
I+3V : For measuring IOP (Check the deterioration of the optical pick-up laser)

IOP : For measuring IOP (Check the deterioration of the optical pick-up laser)

TEO : TRK error signal (Traverse adjustment)

VC : Reference level for checking the signal

RF : RF signal (Check jitter)





## IOP DATA RECORDING AND DISPLAY WHEN OPTICAL PICK-UP AND NON-VOLATILE MEMORY (IC171 OF BD (MD) BOARD) ARE REPLACED

The IOP value labeled on the optical pick-up can be recorded in the non-volatile memory. By recording the value, it will eliminate the need to look at the value on the optical pick-up label. When replacing the optical pick-up or non-volatile memory (IC171 of BD (MD) board), record the IOP value on the optical pick-up according to the following procedure.

### Record Procedure:

1. Press the **■** (CD), **CLEAR** (CD), **■** (MD) and **CLEAR** (MD) buttons at the same time.
2. Press the **◀◀ AMS ▶▶** (MD) knob and **■** (MD) button to display “<0> To Normal”.
3. Turn the **◀◀ AMS ▶▶** (MD) knob and when “<5> MD Test” is displayed, press the **◀◀ AMS ▶▶** (MD) knob.
4. Turn the **◀◀ AMS ▶▶** (MD) knob to display “[Service]”, and press the **YES** button.
5. Turn the **◀◀ AMS ▶▶** (MD) knob to display “Top Write” (C28), and press the **YES** button.
6. The display becomes “Ref=@@.@” (@ is an arbitrary number) and the numbers which can be changed will blink.
7. Input the IOP value written on the optical pick-up label.  
To select the number : Turn the **◀◀ AMS ▶▶** (MD) knob.  
To select the digit : Press the **◀◀ AMS ▶▶** (MD) knob.
8. When the **YES** button is pressed, the display becomes “Measu=@@.@” (@ is an arbitrary number).
9. As the adjustment results are recorded for the 6 value. Leave it as it is and press the **YES** button.
10. “Complete!” will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become “Top Write”.
11. Press the **I/O** button to turn the power OFF.

### Display Procedure:

1. Press the **■** (CD), **CLEAR** (CD), **■** (MD) and **CLEAR** (MD) buttons at the same time.
2. Press the **◀◀ AMS ▶▶** (MD) knob and **■** (MD) button to display “<0> To Normal”.
3. Turn the **◀◀ AMS ▶▶** (MD) knob and when “<5> MD Test” is displayed, press the **◀◀ AMS ▶▶** (MD) knob.
4. Turn the **◀◀ AMS ▶▶** (MD) knob to display “[Service]”, and press the **YES** button.
5. Turn the **◀◀ AMS ▶▶** (MD) knob to display “Top Read” (C27).
6. “@@.@/##.#” is displayed and the recorded contents are displayed.  
@@.@ : indicates the IOP value on the optical pick-up label.  
##.# : indicates the IOP value after adjustment
7. To end, press the **◀◀ AMS ▶▶** (MD) knob or **MENU/NO** button to display “Top Read”. Press the **I/O** button to turn the power OFF.

## CHECKS PRIOR TO PARTS REPLACEMENT AND ADJUSTMENTS IN MD

Before performing repairs, perform the following checks to determine the faulty locations up to a certain extent. Details of the procedures are described in "5 Electrical Adjustments".

	Criteria for Determination (Unsatisfactory if specified value is not satisfied)	Measure if unsatisfactory:
Laser power check (6-2 : See page 32)	<ul style="list-style-type: none"> <li>0.9 mW power Specified value : 0.80 to 0.96 mW</li> <li>8.4 mW power Specified value : 8.2 to 8.6 mW</li> </ul>	<ul style="list-style-type: none"> <li>Clean the optical pick-up</li> <li>Adjust again</li> <li>Replace the optical pick-up</li> </ul>
	<ul style="list-style-type: none"> <li>Iop (at 8.4mW)</li> <li>Labeled on the optical pick-up</li> <li>Iop value <math>\pm</math> 10mA</li> </ul>	<ul style="list-style-type: none"> <li>Replace the optical pick-up</li> </ul>
Traverse check (6-3 : See page 32)	<ul style="list-style-type: none"> <li>Traverse waveform Specified value : Below 10% offset</li> </ul>	<ul style="list-style-type: none"> <li>Replace the optical pick-up</li> </ul>
Focus bias check (6-4 : See page 33)	<ul style="list-style-type: none"> <li>Error rate check Specified value : For points a, b, and c C1 error : About 200 AD error : below 2</li> </ul>	<ul style="list-style-type: none"> <li>Replace the optical pick-up</li> </ul>
C PLAY check (6-5 : See page 33)	<ul style="list-style-type: none"> <li>Error rate check Specified value:               <ol style="list-style-type: none"> <li>When using test disc (MDW-74/AU-1) C1 error : Below 80 AD error : Below 2</li> <li>When using check disc (TDYS-1) C1 error : Below 50</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Replace the optical pick-up</li> </ul>
Self-recording/playback check (6-6 : See page 33)	<ul style="list-style-type: none"> <li>CPLAY error rate check Specified value: C1 error : Below 80 AD error : Below 2</li> </ul>	If always unsatisfactory: <ul style="list-style-type: none"> <li>Replace the overwrite head</li> <li>Check for disconnection of the circuits around the overwrite head</li> </ul>
		If occasionally unsatisfactory: <ul style="list-style-type: none"> <li>Check if the overwrite head is distorted</li> <li>Check the mechanism around the sled</li> </ul>
Temperature compensation offset check (6-1 : See page 32)	<ul style="list-style-type: none"> <li>Unsatisfactory if displayed as T=@@ (##) [NG" NG (@@, ## are both arbitrary numbers)</li> </ul>	<ul style="list-style-type: none"> <li>Check for disconnection of the circuits around D101 (BD (MD) board)</li> <li>Check the signals around IC101, IC121, CN102, CN103 (BD (MD) board)</li> </ul>

**Note:**  
The criteria for determination above is intended merely to determine if satisfactory or not, and does not serve as the specified value for adjustments. When performing adjustments, use the specified values for adjustments.

## SERVICE MODE

This set provides various modes for the service.

Enter the service mode through the procedure given below, and select the desired mode.

### Procedure:




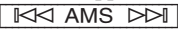
1. Press the **■** (CD), **CLEAR** (CD), **■** (MD) and **CLEAR** (MD) buttons at the same time.
2. Press the **◀◀ AMS ▶▶** (MD) knob and **■** (MD) button to display “<0> To Normal”.
3. At this time, rotating the **◀◀ AMS ▶▶** (MD) knob can select all modes. For the contents of mode, see the following table.
4. To exit from the service mode, press the **■** (MD) button and **◀◀ AMS ▶▶** (MD) knob simultaneously to display “<0> To Normal”, then press the **◀◀ AMS ▶▶** (MD) knob. If this operation failed, press the **I/⏻** button to turn the power OFF.

### Contents of test mode

No.	Display	Function
0	<0> To Normal	Exit from test mode
1	<1> Virsion	Microcomputer Virsion display
2	<2> FLD	FL display test
3	<3> Key/Jog	Key/Jog input test
4	<4> CD Test	CD all sorts test
5	0> AGING	CD aging mode
6	1> COMMAND	Command transfer menu
7	2> ERROR	C1, C2 error display
8	3> SPEED X1	Disc speed selection
9	4> ISRC	ISRC display
10	5> CHECK8	Check 8 cm display
11	6> AUTO G	Auto gain display
12	7> HENSHIN	Decentiering display
13	8> PORT	Port selection
14	9> AMS	AMS display
15	A> TRK ON	TRK ON/OFF display
16	<5> MD Test	MD all sorts test
17	<6> Retry & TOC	MD TOC off & Retry test
18	<7> Initial	All reset
19	<8> Special	Command, Sircs test
20	<9> Dump	Microcomputer Dump mode






### Microcomputer Version Display

#### Procedure:

1. Enter the service mode, then rotate  (MD) knob to display "<1> Version", and press the  (MD).
2. The CD and MD microcomputer versions are displayed on the upper line and lower line respectively.
3. To exit from the mode, press the  (MD) button and  (MD) knob simultaneously.



### FL Display Test

#### Procedure:


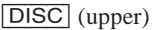

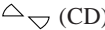



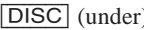
















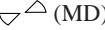


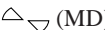






1. Enter the service mode, then rotate  (MD) knob to display "<2> FLD", and press the  (MD).
2. The fluorescent display tube turns ON fully. Each time the  (MD) knob is pressed, the display changes such as [Full ON] → [Partial ON] → [Selected menu].
3. To exit from the mode, press the  (MD) button and  (MD) knob simultaneously.

### Key/Jog Input Test

#### Procedure:



1. Enter the service mode, then rotate  (MD) knob to display "<3> Key/Jog", and press the  (MD).
2. KEY=29 is displayed, and each time a key is pressed, the corresponding pictograph goes off and numeric value is counted down. When all keys were pressed, KEY=0 is displayed.

### Correspondence between KEY and pictorial display

KEY	Pictorial display	KEY	Pictorial display	KEY	Pictorial display
 (CD)	 (upper)	 (CD)	 (CD)	CD SYNCHRO HIGH	X 4
 (CD)	 (CD)	 (MD)	 (under)	CD SYNCHRO NORMAL	SYNC
 (CD)	 (upper)	CLEAR (MD)	 (under)	 OPNE/CLOSE	
 (CD)	 (upper)	TIME MD	MONO	 (MD)	
 I/⏻	 (OVER)	PLAY MODE MD	L.SYNC	 (MD)	 (under)
PLAY MODE CD	OPT	INPUT	COAX	 (MD)	 (under)
TIME CD	CD	DISPLAY	ANALOG	 (MD)	 (MD)
CLEAR (CD)	 (upper)	 (MD)	 (MD)	REC ● (MD)	
REC-IT (CD)	REC IT	YES	TOC	 EJECT	
 (CD)	 (CD)	MENU/NO			

### Software Reset

#### Procedure:

1. Enter the service mode, then rotate  (MD) knob to display "<6> Initial", and press the  (MD).
2. The microcomputer resets the software, and the power is turned off.

## RETRY CAUSE DISPLAY MODE IN MD

- In this test mode, the causes for retry of the unit during recording can be displayed on the fluorescent indicator tube. During playback, the “track mode” for obtaining track information will be set. This is useful for locating the faulty part of the unit.
- The following will be displayed :
  - During recording and stop: Retry cause, number of retries, and number of retry errors.
  - During playback : Information such as type of disc played, part played, copyright.
 These are displayed in hexadecimal.

### Procedure:

- Load a recordable disc whose contents can be erased into the unit.
- Press the **MENU/NO** button. When “Edit Menu” is displayed on the fluorescent indicator tube, turn the **◀◀ AMS ▶▶** (MD) knob to display “All Erase?”.
- Press the **YES** button. (Or press the **◀◀ AMS ▶▶** (MD) knob)
- When “All Erase??” is displayed on the fluorescent indicator tube, the music calendar number blinks.
- Press the **YES** button to display “Complete!!”, and press the **■** (MD) button immediately. Wait for about 15 seconds while pressing the button. (The **◀◀ AMS ▶▶** (MD) knob can be pressed instead of the **YES** button for the same results)
- When the “TOC” displayed on the fluorescent display tube goes off, release the **■** (MD) button.
- Press the **REC ●** button to start recording. Then press the **||** (MD) button and start recording.
- To check the “track mode”, press the **▷** (MD) button to start play.
- To release the test mode, press the **I/O** button, and turn OFF the power. When “TOC” disappears, disconnect the power plug from the outlet.

**Fig. 1 Reading the Test Mode Display (During recording and stop)**

**RTs@c##e\*\***  
Fluorescent indicator tube display

@@ : Cause of retry  
## : Number of retries  
\*\* : Number of retry errors

**Fig. 2 Reading the Test Mode Display (During playback)**

**@@ ###\*\* \$\$**  
Fluorescent indicator tube display

@@ : Parts No. (name of area named on TOC)  
## : Cluster } Address  
\*\* : Sector }  
\$\$ : Track mode (Track information such as copy-right information of each part)

### Reading the Retry Cause Display

Hexadecimal	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock	When track jump (shock) is detected
	0	0	0	0	0	0	1	0	02	ader5	When ADER was counted more than five times continuously
	0	0	0	0	0	1	0	0	04	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	1	0	0	0	08	DIN unlock	When DIN unlock is detected
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	CLV unlock	When CLV is unlocked
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

### Reading the Display:

Convert the hexadecimal display into binary display. If more than two causes, they will be added.

### Example

When 42 is displayed:  
Higher bit: 4 = 0100 → b6  
Lower bit : 2 = 0010 → b1  
In this case, the retry cause is combined of “CLV unlock” and “ader5”.

When A2 is displayed:  
Higher bit: A = 1010 → b7 + b5  
Lower bit : 2 = 0010 → b1  
The retry cause in this case is combined of “access fault”, “IVR rec error”, and “ader5”.

### Reading the Retry Cause Display

Hexadecimal	Higher Bits				Lower Bits				Hexa- decimal	Details	
	8	4	2	1	8	4	2	1		When 0	When 1
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01. 01:Normal audio. Others:Invalid	
	0	0	0	0	1	0	0	0	08		
	0	0	0	1	0	0	0	0	10	Audio (Normal)	Invalid
	0	0	1	0	0	0	0	0	20	Original	Digital copy
	0	1	0	0	0	0	0	0	40	Copyright	No copyright
	1	0	0	0	0	0	0	0	80	Write prohibited	Write allowed

#### Reading the Display:

Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example When 84 is displayed:

Higher bit : 8 = 1000 → b7

Lower bit : 4 = 0100 → b2

In this case, as b2 and b7 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis OFF”, “monaural”, “original”, “copyright exists”, and “write allowed”.

Example When 07 is displayed:

Higher bit : 0 = 1000 → All 0

Lower bit : 7 = 0111 → b0 + b1 + b2

In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis ON”, “stereo”, “original”, “copyright exists”, and “write prohibited”.

#### Hexadecimal → Binary Conversion Table


Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111



## CD-TEXT TEST DISC

This unit is able to display the test data (character information) written in the CD on its fluorescent indicator tube. The CD-TEXT TEST DISC (TGCS-313:4-989-366-01) is used for checking the display. To check, perform the following procedure.

### Checking Method:

1. Turn ON the power, set the disc to the disc table with the “test disc” label facing up, and chuck the disc.
2. Press the  (CD) button and play back the disc.
3. The following will be displayed on the fluorescent indicator tube.

Display : 1kHz/0dB

4. Rotating  (CD) knob, select the track. The text data of each track will be displayed.

For details of the displayed contents for each track, refer to “Table 1 : CD-TEXT TEST DISC TEXT Data Contents” and “Table 2 : CD-TEXT TEST DISC Recorded Contents and Display”.

### Restrictions in CD-TEXT Display

In this unit, some special characters will not be displayed properly. These will be displayed as a space or a character resembling it. For details, refer to “Table 2 : CD-TEXT DISC Recorded Contents and Display”.

**Table 1 : CD-TEXT TEST DISC TEXT Data Contents (TRACKS No. 1 to 41:Normal Characters)**

TRACK No.	Displayed Contents	TRACK No.	Displayed Contents
1	1kHz/0dB/L&R	22	1kHz/-90dB/L&R
2	20Hz/0dB/L&R	23	Infinity Zero w/o emphasis//L&R
3	40Hz/0dB/L&R	24	Infinity Zero with emphasis//L&R
4	100Hz/0dB/L&R	25	400Hz+7kHz(4:1)/0dB/L&R
5	200Hz/0dB/L&R	26	400Hz+7kHz(4:1)/-10dB/L&R
6	500Hz/0dB/L&R	27	19kHz+20kHz(1:1)/0dB/L&R
7	1kHz/0dB/L&R	28	19kHz+20kHz(1:1)/-10dB/L&R
8	5kHz/0dB/L&R	29	100Hz/0dB/L*
9	7kHz/0dB/L&R	30	1kHz/0dB/L*
10	10kHz/0dB/L&R	31	10kHz/0dB/L*
11	16kHz/0dB/L&R	32	20kHz/0dB/L*
12	18kHz/0dB/L&R	33	100Hz/0dB/R*
13	20kHz/0dB/L&R	34	1kHz/0dB/R*
14	1kHz/0dB/L&R	35	10kHz/0dB/R*
15	1kHz/-1dB/L&R	36	20kHz/0dB/R*
16	1kHz/-3dB/L&R	37	100Hz Squer Wave//L&R
17	1kHz/-6dB/L&R	38	1kHz Squer Wave//L&R
18	1kHz/-10dB/L&R	39	1kHz w/emphasis/-0.37dB/L&R
19	1kHz/-20dB/L&R	40	5kHz w/emphasis/-4.53dB/L&R
20	1kHz/-60dB/L&R	41	16kHz w/emphasis/-9.04dB/L&R
21	1kHz/-80dB/L&R		

**Note:** The contents of Track No. 1 to 41 are the same as those of the current TEST DISC-their titles are displayed.

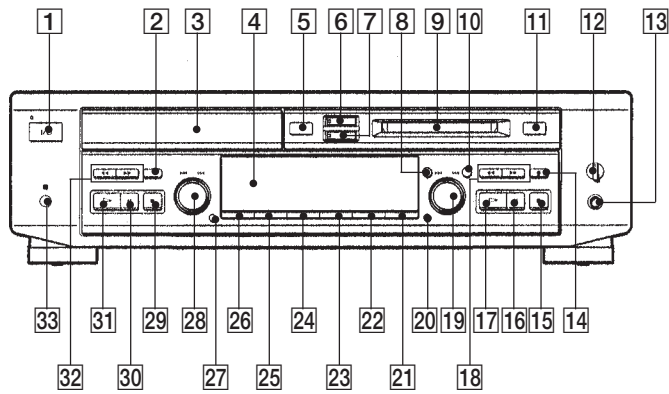
**Table 2: CD-TEXT TEST DISC Recorded Contents and Display**

(In this unit, some special characters cannot be displayed. This is not a fault)

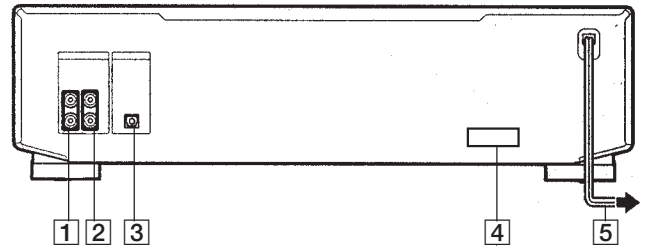
TRACK No.	Recorded contents	Display
42	! " # \$ % & ' (21h to 27h) 1kHz 0dB L&R	← All the same
43	( ) * + , - . / (28h to 2Fh)	← All the same
44	0 1 2 3 4 5 6 7 (30h to 37h)	← All the same
45	8 9 : ; < = > ? (38h to 3Fh)	← All the same
46	@ A B C D E F G (40h to 47h)	← All the same
47	H I J K L M N O (48h to 4Fh)	← All the same
48	P Q R S T U V W (50h to 57h)	← All the same
49	X Y Z [ \ ] ^ _ (58h to 5Fh)	← All the same
50	` a b c d e f g (60h to 67h)	← All the same
51	h i j k l m n o (68h to 6Fh)	← All the same
52	p q r s t u v w (70h to 77h)	← All the same
53	x y z {   } ~ ■ (78h to 7Fh)	← All the same
54	■ i ç £ ¤ ¥ ¦ § (A0h to A7h) 8859-1	(A0h to A7h) 8859-1
55	♪ © ª « ¬ ® ¯ (A8h to AFh)	(A8h to AFh)
56	• ± ² ³ ´ µ ¶ • (B0h to B7h)	(B0h to B7h)
57	† † ° » ¼ ½ ¾ ¿ (B8h to BFh)	(B8h to BFh)
58	À Á Â Ã Ä Å Æ Ç (C0h to C7h)	A A A A A A C (C0h to C7h)
59	È É Ê Ë Ì Í Î Ï (C8h to CFh)	E E E E I I I I (C8h to CFh)
60	Ð Ñ Ò Ó Ô Õ Ö × (D0h to D7h)	D N O O O O O (D0h to D7h)
61	Ø Ù Ú Û Ü Ý Þ ß (D8h to DFh)	O U U U U Y (D8h to DFh)
62	à á â ã ä å æ ç (E0h to E7h)	a a a a a a c (E0h to E7h)
63	è é ê ë ì í î ï (E8h to FFh)	e e e e i i i i (E8h to EFh)
64	ð ñ ò ó ô õ ö ÷ (F0h to F7h)	d n o o o o o (F0h to F7h)
65	ø ù ú û ü ý Þ ÿ (F8h to FFh)	o u u u u y y (F8h to FFh)
66	No.66	← All the same
67	No.67	← All the same
to	to	to
99	No.99	← All the same

## SECTION 2 GENERAL

**Front view**



**Rear view**



- 1 I/⏻ (power) switch
- 2 REC-IT button
- 3 CD disc tray
- 4 Display window
- 5 ≡ OPEN/CLOSE button
- 6 CD SYNC NORMAL button
- 7 CD SYNC HIGH button
- 8 MENU/NO button
- 9 MD insertion slot
- 10 YES button
- 11 ≡ EJECT button
- 12 PHONE LEVEL control
- 13 PHONES jack
- 14 REC ● button
- 15 ■ button
- 16 || button
- 17 ▷ button
- 18 ◀▶ button
- 19 AMS control
- 20 CLEAR button
- 21 MD TIME button
- 22 MD PLAY MODE button
- 23 INPUT button
- 24 DISPLAY button
- 25 CD PLAY MODE button
- 26 CD TIME button
- 27 CLEAR button
- 28 AMS control
- 29 ■ button
- 30 || button
- 31 ▷ button
- 32 ◀▶ button
- 33 Remote sensor

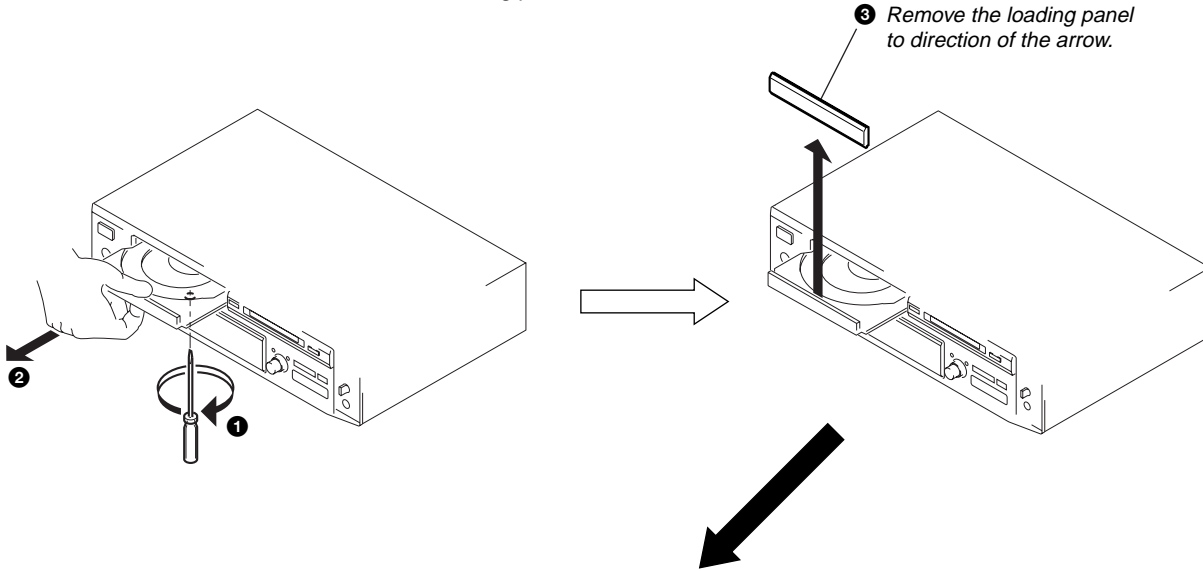
- 1 LINE (ANALOG) IN jack
- 2 LINE (ANALOG) OUT jack
- 3 DIGITAL OPTICAL IN terminal
- 4 VOLTAGE SELECTOR switch (singapore model only)
- 5 AC power cord

## SECTION 3 DISASSEMBLY

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

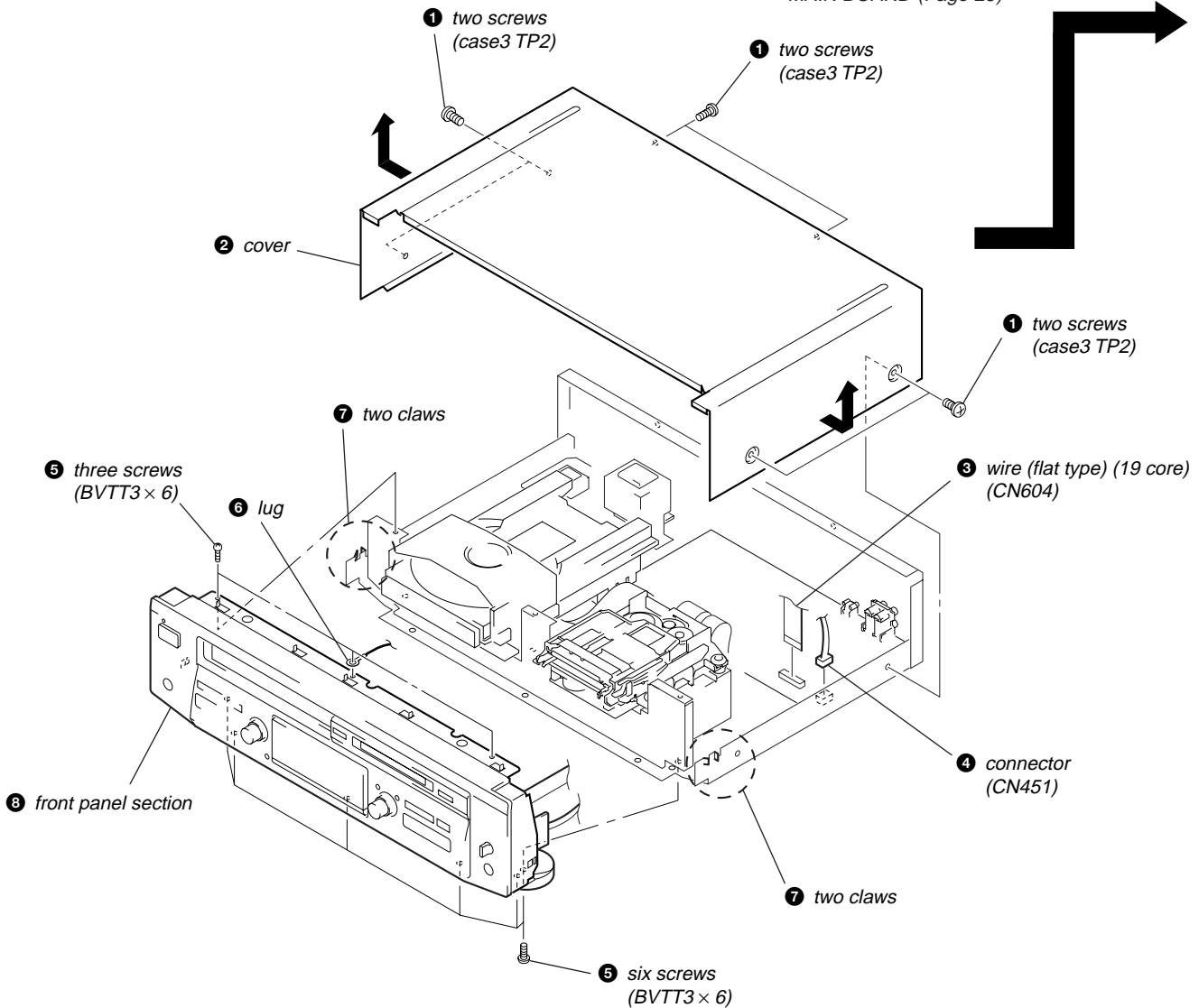
### LOADING PANEL

In removing the front panel with the power not supplied, insert a flat-blade screwdriver into a hole at the bottom of loading section and rotate it counterclockwise. Then, draw out the disc table and remove the loading panel.

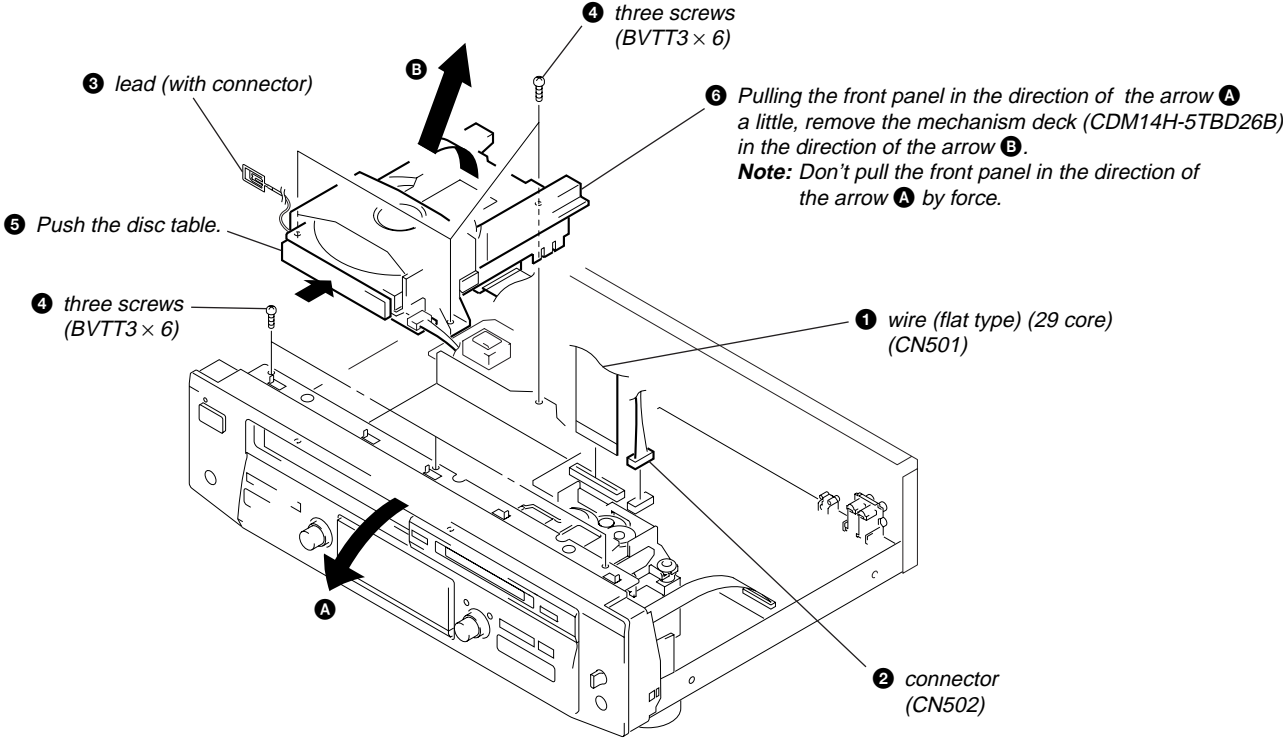


### COVER, FRONT PANEL SECTION

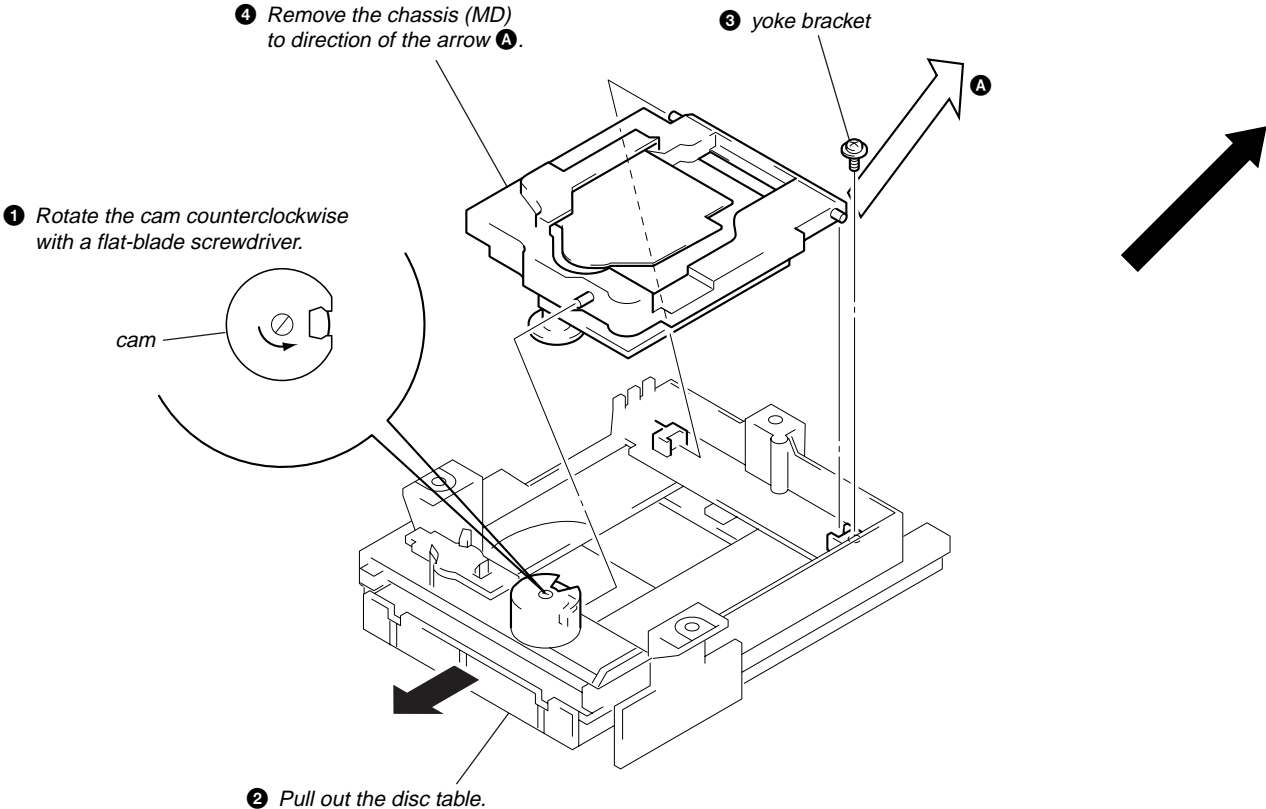
CD MECHANISM DECK SECTION (Page 19)  
MD MECHANISM DECK SECTION (Page 21)  
MAIN BOARD (Page 23)



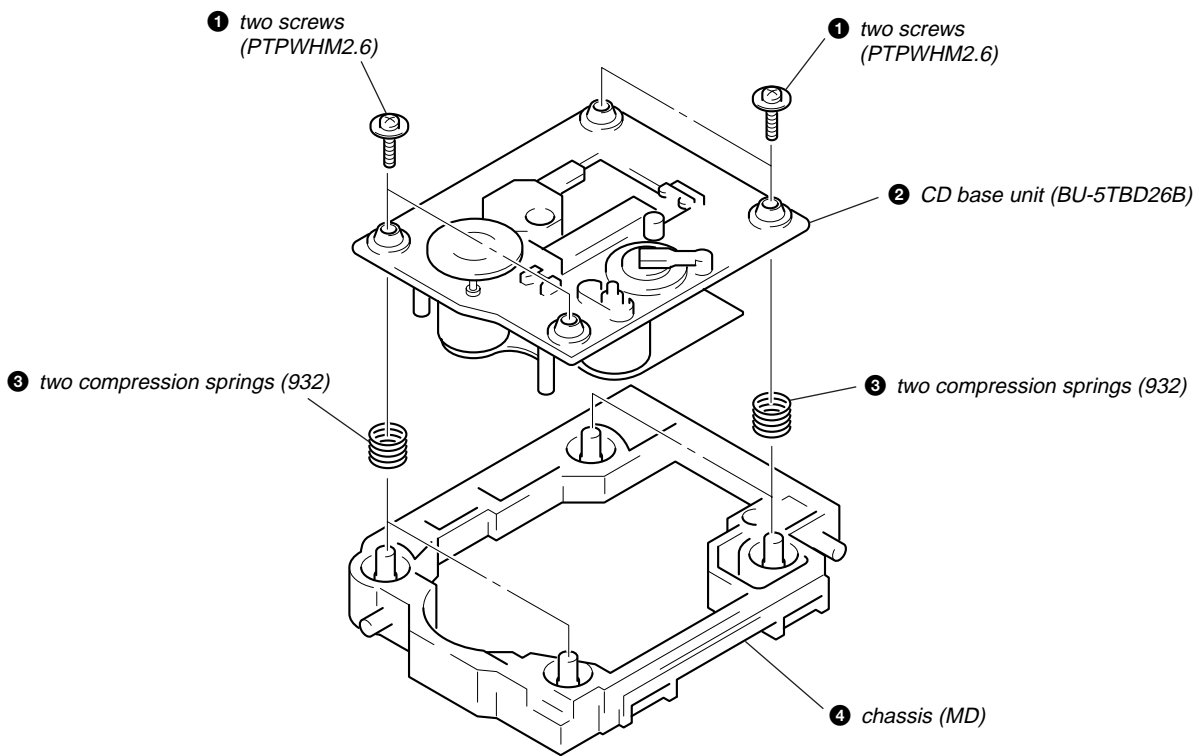
**CD MECHANISM DECK SECTION  
(CDM14H-5TBD26B)**



**CHASSIS (MD)**

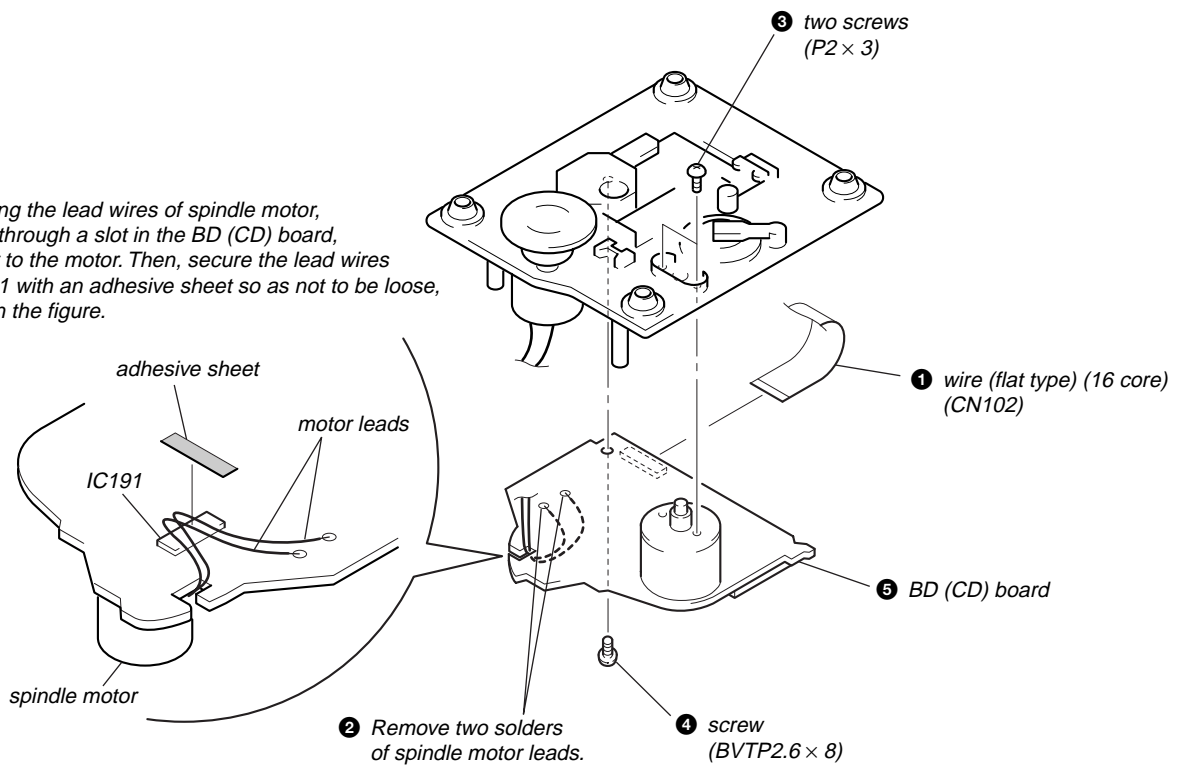


## CD BASE UNIT (BU-5TBD26B)



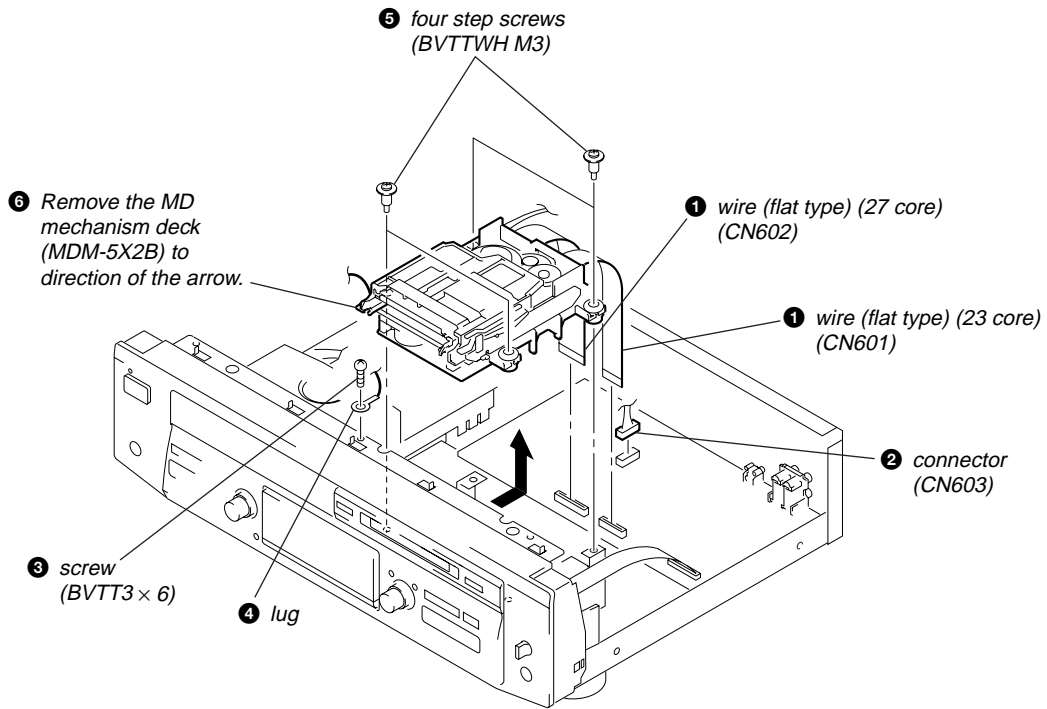
## BD (CD) BOARD

**Note:** When routing the lead wires of spindle motor, pass them through a slot in the BD (CD) board, then solder to the motor. Then, secure the lead wires to the IC191 with an adhesive sheet so as not to be loose, as shown in the figure.

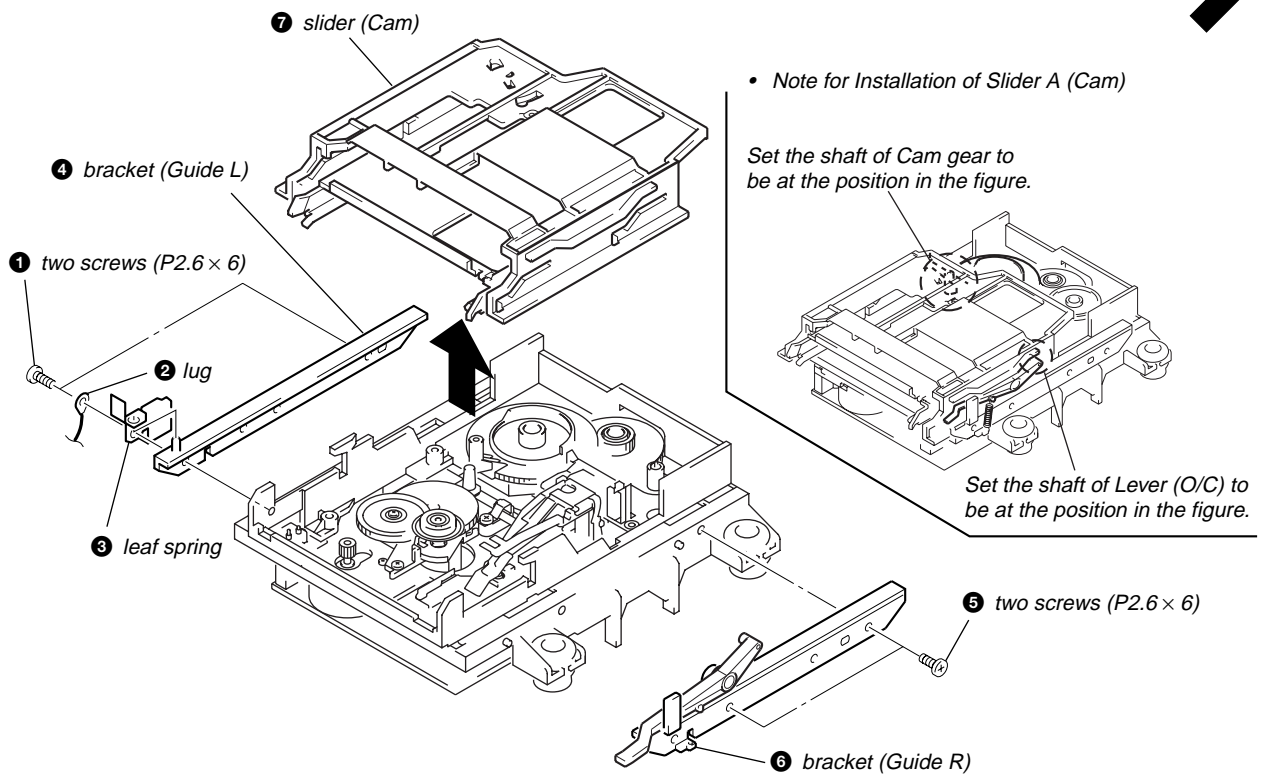




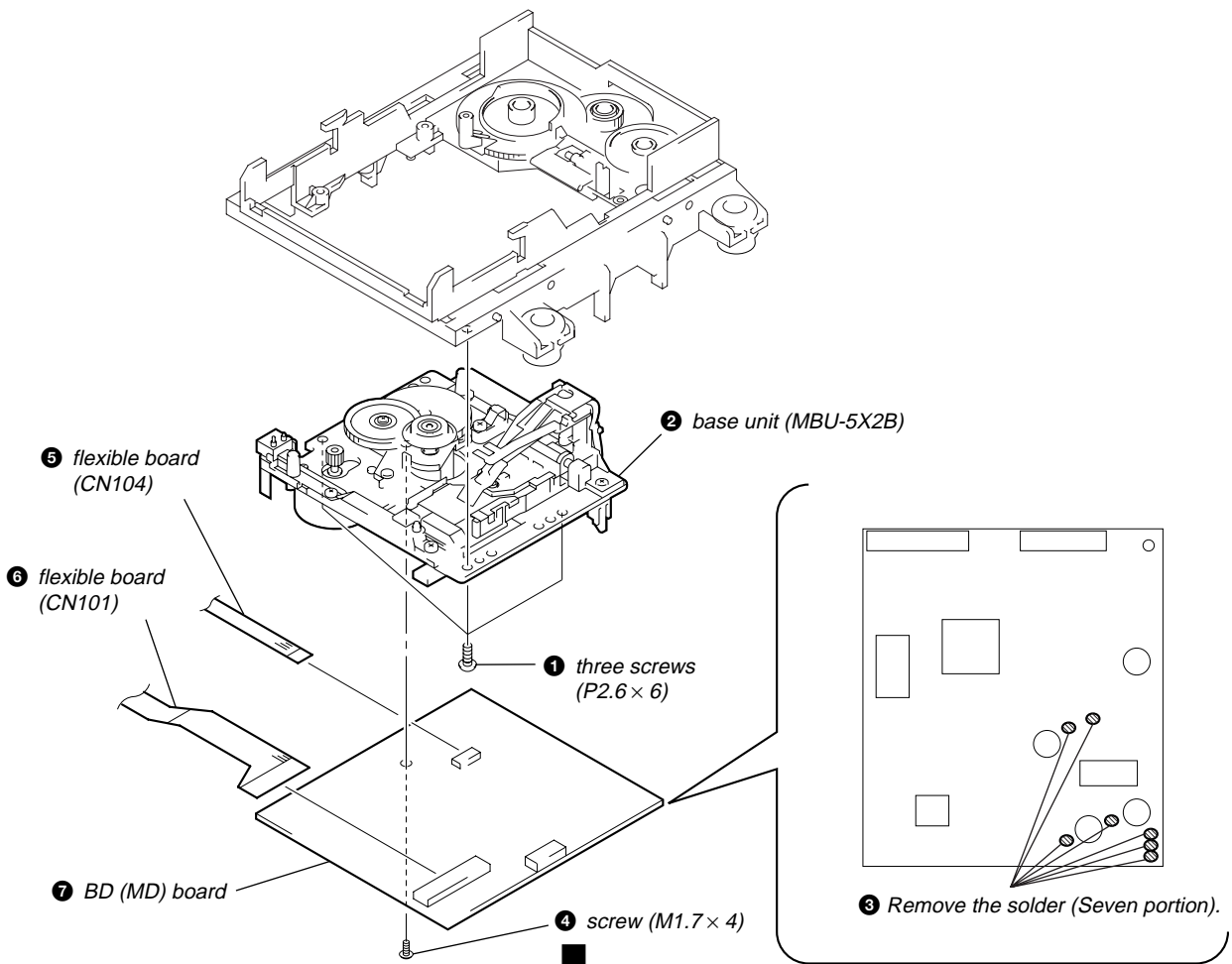
**MD MECHANISM DECK SECTION  
(MDM-5X2B)**



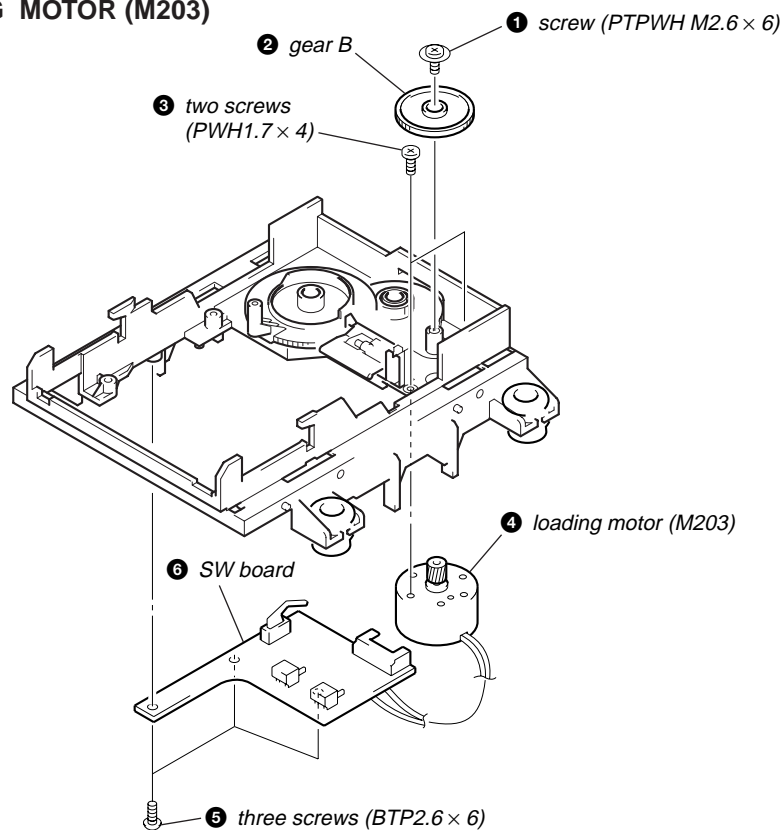
**SLIDER (CAM)**



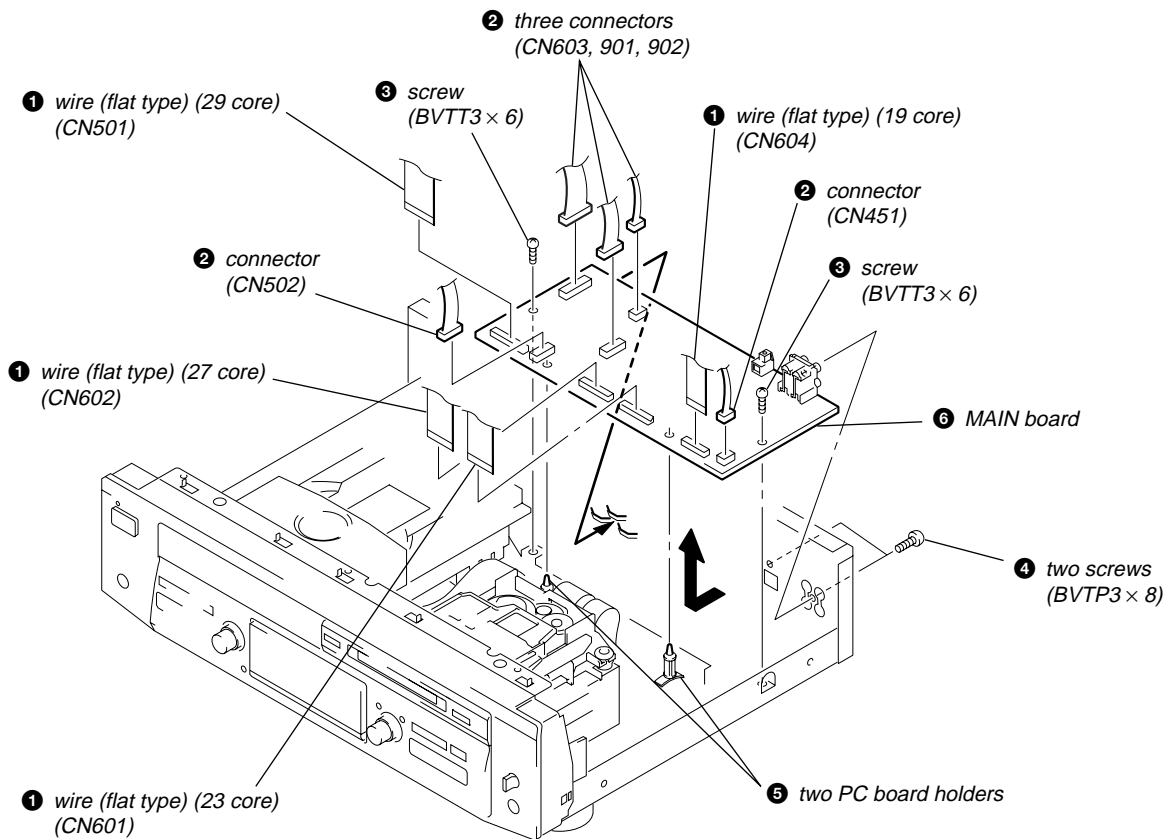
**MD BASE UNIT (MBU-5X2B), BD (MD) BOARD**



**SW BOARD, LOADING MOTOR (M203)**

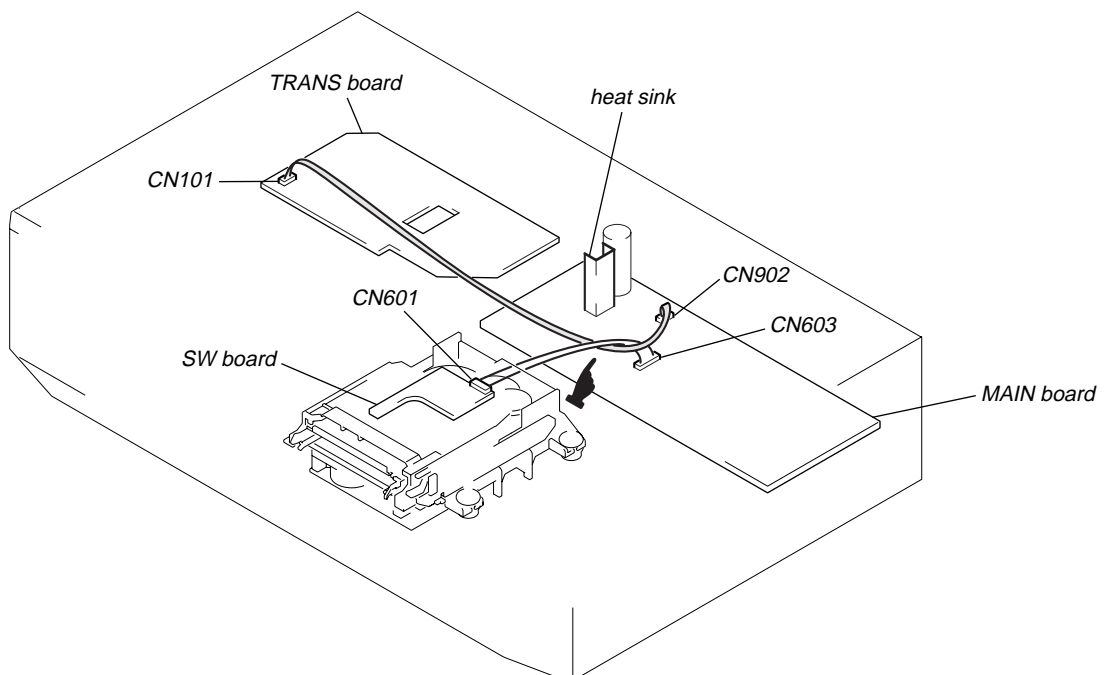


## MAIN BOARD



## MEASURE AGAINST HEAT FROM HEAT SINK

When connecting the cable from TRANS board (CN101) to MAIN board (CN902), cross it with the cable between SW board (CN601) and MAIN board (CN603), as shown in the figure.



# SECTION 4 TEST MODE

## MD SECITON

**Note:** MD always plays double speed.

### 1. PRECAUTIONS FOR USE OF TEST MODE

- As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.  
Even if the **EJECT** button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.  
Therefore, it will be ejected while rotating.  
Be sure to press the **EJECT** button after pressing the **MENU/NO** button and the rotation of disc is stopped.

#### 1-1. Recording laser emission mode and operating buttons

- Continuous recording mode (CREC MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUS)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUS)
- When pressing the **REC ●** button.

### 2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

**Procedure 1:** Press the **CD**, **CLEAR** (CD), **MD** and **CLEAR** (MD) buttons at the same time.

Press the **AMS** (MD) knob and **MD** button to display “< 0 > To Normal”.

Turn the **AMS** (MD) knob and when “< 5 > MD Test” is displayed, press the **AMS** (MD) knob. When the test mode is set, “[Check]” will be displayed. Turn the **AMS** (MD) knob switches between the following four groups; ... ↔ [Check] ↔ [Adjust] ↔ [Service] ↔ [Develop] ↔ ...

**Procedure 2:** While pressing the **AMS** (MD) knob, connect the power plug to the outlet and release the **AMS** (MD) knob.

When the test mode is set, “TEMP CHECK” will be displayed. By setting the test mode using this method, only the “Check” group of method 1 can be executed.

### 3. RELEASING THE TEST MODE

Press the **I/O** button to turn the power OFF. (with initialize)

### 4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the **AMS** (MD) knob, **YES** button, and **MENU/NO** button.

The functions of these buttons are as follows.

Function name	Function
<b>AMS</b> knob (MD)	Changes parameters and modes
<b>YES</b> button	Proceeds onto the next step. Finalizes input.
<b>MENU/NO</b> button	Returns to previous step. Stops operations.

## 5. SELECTING THE TEST MODE

There are 31 types of test modes as shown below. The groups can be switched by turning the **◀◀ AMS ▶▶** (MD) knob. After selecting the group to be used, press the **YES** button. After setting a certain group, turn the **◀◀ AMS ▶▶** (MD) knob switches between these modes.

Refer to “Group” in the table for details can be selected.

All items used for servicing can be treated using group S. So be carefully not to enter other groups by mistake.

Display	No.	Contents	Mark	Group (*)
TEMP CHECK	C01	Temperature compensation offset check		C S
LDPWR CHECK	C02	Laser power check		C S
EF MO CHECK	C03	Traverse (MO) check		C S
EF CD CHECK	C04	Traverse (CD) check		C S
FBIAS CHECK	C05	Focus bias check		C S
Scurve CHECK	C06	S letter check	(X)	C
VERIFYMODE	C07	Non-volatile memory check	(X)	C
DETRK CHECK	C08	Detrack check	(X)	C
TEMP ADJUS	C09	Temperature compensation offset adjustment		A S
LDPWR ADJUS	C10	Laser power adjustment		A S
EF MO ADJUS	C11	Traverse (MO) adjustment		A S
EF CD ADJUS	C12	Traverse (CD) adjustment		A S
FBIAS ADJUS	C13	Focus bias adjustment		A S
EEP MODE	C14	Non-volatile memory control	(X) (!)	D
MANUAL CMD	C15	Command transmission	(X)	D
SVDATA READ	C16	Status display	(X)	D
ERR DP MODE	C17	Error history display, clear		S
SLED MOVE	C18	Sled check	(X)	D
ACCESS MODE	C19	Access check	(X)	D
0920 CHECK	C20	Outermost circumference check	(X)	D
HEAD ADJUST	C21	Head position check	(X)	D
CPLAY 1MODE	C22	Same functions as CPLAY MODE (Not used in servicing)	(X)	D
CREC 1MODE	C23	Same functions as CREC MODE (Not used in servicing)	(X)	D
ADJ CLEAR	C24	Initialization of non-volatile memory of adjustment value		A S
AG Set (MO)	C25	Auto gain output level adjustment (MO)		A S
AG Set (CD)	C26	Auto gain output level adjustment (CD)		A S
Iop Read	C27	IOP data display		C S
Iop Write	C28	IOP data write		A S
INFORMATION	C29	Microprocessing version display		C S
CPLAY MODE	C30	Continuous playback mode		C A S D
CREC MODE	C31	Continuous recording mode		C A S D

Group (\*)

C: Check

A: Adjust

S: Service

D: Develop

- For details of each adjustment mode, refer to “5. Electrical Adjustments”.
- For details of “ERR DP MODE”, refer to “Self-Diagnosis Function” on page 2.
- If a different mode has been selected by mistake, press the **MENU/NO** button to release that mode.
- Modes with (X) in the Mark column are not used for servicing and therefore are not described in detail. If these modes are set accidentally, press the **MENU/NO** button to release the mode immediately. Be especially careful not to set the modes with (!) as they will overwrite the non-volatile memory and reset it, and as a result, the unit will not operate normally.

### 5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
  - (1) Set the disc in the unit. (Whichever recordable discs or discs for playback only are available)
  - (2) Turn the [◀◀ AMS ▶▶] (MD) knob and display “CPLAY MODE” (C30).
  - (3) Press the [YES] button to change the display to “CPLAY MID”.
  - (4) When access completes, the display changes to “C = [ ] AD = [ ]”.

**Note:** The numbers “[ ]” displayed show you error rates and ADER.

#### 2. Changing the parts to be played back

- (1) Press the [YES] button during continuous playback to change the display as below.



When pressed another time, the parts to be played back can be moved.

- (2) When access completes, the display changes to “C = [ ] AD = [ ]”.

**Note:** The numbers “[ ]” displayed show you error rates and ADER.

#### 3. Ending the continuous playback mode

- (1) Press the [MENU/NO] button. The display will change to “CPLAY MODE”.
- (2) Press the [EJECT] button and take out the disc.

**Note:** The playback start addresses for IN, MID, and OUT are as follows.

IN 40h cluster  
MID 300h cluster  
OUT 700h cluster

### 5-2. Operating the Continuous Recording Mode (Use only when performing self-recording/playback check)

1. Entering the continuous recording mode
  - (1) Set a recordable disc in the unit.
  - (2) Turn the [◀◀ AMS ▶▶] (MD) knob and display “CREC MODE”.
  - (3) Press the [YES] button to change the display to “CREC MID” (C31).
  - (4) When access completes, the display changes to “CREC [ ]” and “REC” lights up.

**Note:** The numbers “[ ]” displayed shows you the recording position addresses.

#### 2. Changing the parts to be recorded

- (1) When the [YES] button is pressed during continuous recording, the display changes as below.



When pressed another time, the parts to be recorded can be changed. “REC” goes off.

- (2) When access completes, the display changes to “CREC [ ]” and “REC” lights up.

**Note:** The numbers “[ ]” displayed shows you the recording position addresses.

#### 3. Ending the continuous recording mode

- (1) Press the [MENU/NO] button. The display changes to “CREC MODE” and “REC” goes off.
- (2) Press the [EJECT] button and take out the disc.

**Note 1:** The recording start addresses for IN, MID, and OUT are as follows.

IN 40h cluster  
MID 300h cluster  
OUT 700h cluster

**Note 2:** The [MENU/NO] button can be used to stop recording anytime.

**Note 3:** Do not perform continuous recording for long periods of time above 5 minutes.

**Note 4:** During continuous recording, be careful not to apply vibration.

### 5-3. Non-Volatile Memory Mode (EEP MODE)

This mode reads and writes the contents of the non-volatile memory.

It is not used in servicing. If the unit entered this mode accidentally, press the [MENU/NO] button immediately to release it.



## 6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
▷ (MD)	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
■ (MD)	Stops continuous playback and continuous recording.
▶▶ (MD)	The sled moves to the outer circumference only when this is pressed.
◀◀ (MD)	The sled moves to the inner circumference only when this is pressed.
CLEAR (MD)	Switches between the pit and groove modes when pressed.
PLAY MODE (MD)	Switches the spindle servo mode (CLV-S ↔ CLV-A).
DISPLAY	Switches the displayed contents each time the button is pressed
⊞ EJECT	Ejects the disc
I/⏻	Releases the test mode

## 7. TEST MODE DISPLAYS

Each time the [DISPLAY] button is pressed, the display changes in the following order.

### 1. Mode display

Displays “TEMP ADJUS”, “CPLAYMODE”, etc.

### 2. Error rate display

Displays the error rate in the following way.

C = □□□□ AD = □□

C = Indicates the C1 error.

AD = Indicates ADER.

### 3. Address display

The address is displayed as follows. (MO: recordable disc, CD: playback only disc)

Press the [CLEAR] (MD) button to switches between the groove display and pit display.

h = □□□□ s = □□□□ (MO pit and CD)

h = □□□□ a = □□□□ (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

**Note:** “-” is displayed when servo is not imposed.

### 4. Auto gain display (Not used in servicing)

The auto gain is displayed as follows.

AG = □□/□□[ □□

### 5. Detrack check display (Not used in servicing)

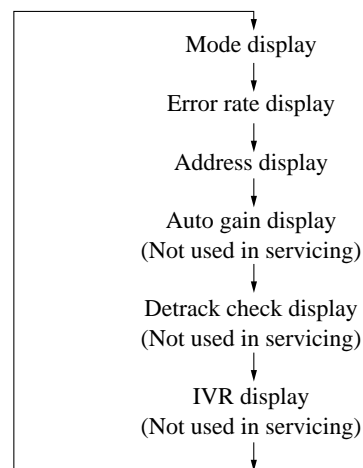
The detrack is displayed as follows.

ADR = □□□□□□

### 6. IVR display (Not used in servicing)

The IVR is displayed as follows.

[□□][□□][□□



## MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
▷	During continuous playback (CLV: ON)	STOP (CLV: OFF)
	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
SYNC	CLV low speed mode	CLV normal mode
L.SYNC	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
REP	Tracking auto gain OK	
1	Focus auto gain OK	
TRACK (under)	Pit	Groove
DISC (under)	High reflection	Low reflection
SHUF	CLV-S	CLV-A
MONO	CLV LOCK	CLV UNLOCK
TOC EDIT	Jitter monitor	

## CD SECTION

Set the CD test mode when performing confirmations.  
After completing confirmation, release the CD test mode.

### 1. AGING MODE

This mode repeatedly opens and closes the CD tray, and plays CD.  
This operation is repeated unless an error occurs. If an error occurred, the aging stops.

#### Procedure:

- Set a disc in advance.
- Enter the test mode, then rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob to display "0> AGING", and press the  $\llcorner$  AMS  $\lrcorner$  (CD).
- When "AGING \*\*" is displayed on the FL tube, rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob so that \*\* portion becomes 00.
- Press the  $\llcorner$  AMS  $\lrcorner$  (CD), and the aging is executed through the following sequence.

#### Aging sequence

- 00: Normal
  - 01: Normal + Exchange (not used)
  - 02: Never mind
  - 03: Never mind
  - 04: BD access
  - 05: Sound skip
  - 06: Reverse to normal
- To finish the aging, press the  $\blacksquare$  (CD) button.

### 2. COMMAND TRANSFER MENU

#### Procedure:

- Enter the test mode, then rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob to display "1> COMMAND", and press the  $\llcorner$  AMS  $\lrcorner$  (CD) knob.
- Select a command with  $\llcorner$  AMS  $\lrcorner$  (CD) knob, and press the  $\llcorner$  AMS  $\lrcorner$  (CD) knob to set.
- Select the edit position with  $\llcorner$  (CD) and  $\lrcorner$  (CD) buttons, and rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob for editing, then press the  $\llcorner$  AMS  $\lrcorner$  (CD) knob for transfer.
- To exit from this mode, press  $\blacksquare$  (MD) button and  $\llcorner$  AMS  $\lrcorner$  (MD) knob simultaneously.

### 3. C1, C2 ERROR DISPLAY

#### Procedure:

- Enter the test mode, then rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob to display "2> ERROR", and press the  $\llcorner$  AMS  $\lrcorner$  (CD) knob.
- C1 error and C2 error are displayed on the left side and right side with 4-digit codes respectively.
- To exit from this mode, press  $\blacksquare$  (MD) button and  $\llcorner$  AMS  $\lrcorner$  (MD) knob simultaneously.






### 4. DISC SPEED SELECTION

#### Procedure:

- Enter the test mode, then rotate  $\llcorner$  AMS  $\lrcorner$  (CD) knob to display "3> SPEEDx1", and press the  $\llcorner$  AMS  $\lrcorner$  (CD) knob.
- Each time the  $\llcorner$  AMS  $\lrcorner$  (CD) knob is pressed, the speed changes over such as x1 → x2 → x4 → x1.
- To exit from this mode, press  $\blacksquare$  (MD) button and  $\llcorner$  AMS  $\lrcorner$  (MD) knob simultaneously.





## 5. ISRC DISPLAY

### Procedure:

- (1) Enter the test mode, then rotate  (CD) knob to display “4> IRSC”, and press the  (CD) knob.
- (2) Rotating the  (CD) knob counterclockwise displays higher-order 5 digits, or clockwise displays lower-order 7 digits.
- (3) To exit from this mode, press  (MD) button and  (MD) knob simultaneously.







## 6. CHECK 8 cm DISPLAY

### Procedure:

- (1) Enter the test mode, then rotate  (CD) knob to display “5> CHECK 8”, and press the  (CD) knob.
- (2) To check the disc size (8 cm or 12 cm), the value is displayed.
- (3) To exit from this mode, press  (MD) button and  (MD) knob simultaneously.

## 7. PORT SELECTION

### Procedure:

- (1) Enter the test mode, then rotate  (CD) knob to display “8> PORT”, and press the  (CD) knob.
- (2) Rotate the  (CD) knob to select GFS, ERROR RATE, RFCK and press the  (CD) knob to set.
- (3) To exit from this mode, press  (MD) button and  (MD) knob simultaneously.

# SECTION 5 ELECTRICAL ADJUSTMENTS

## MD SECTION

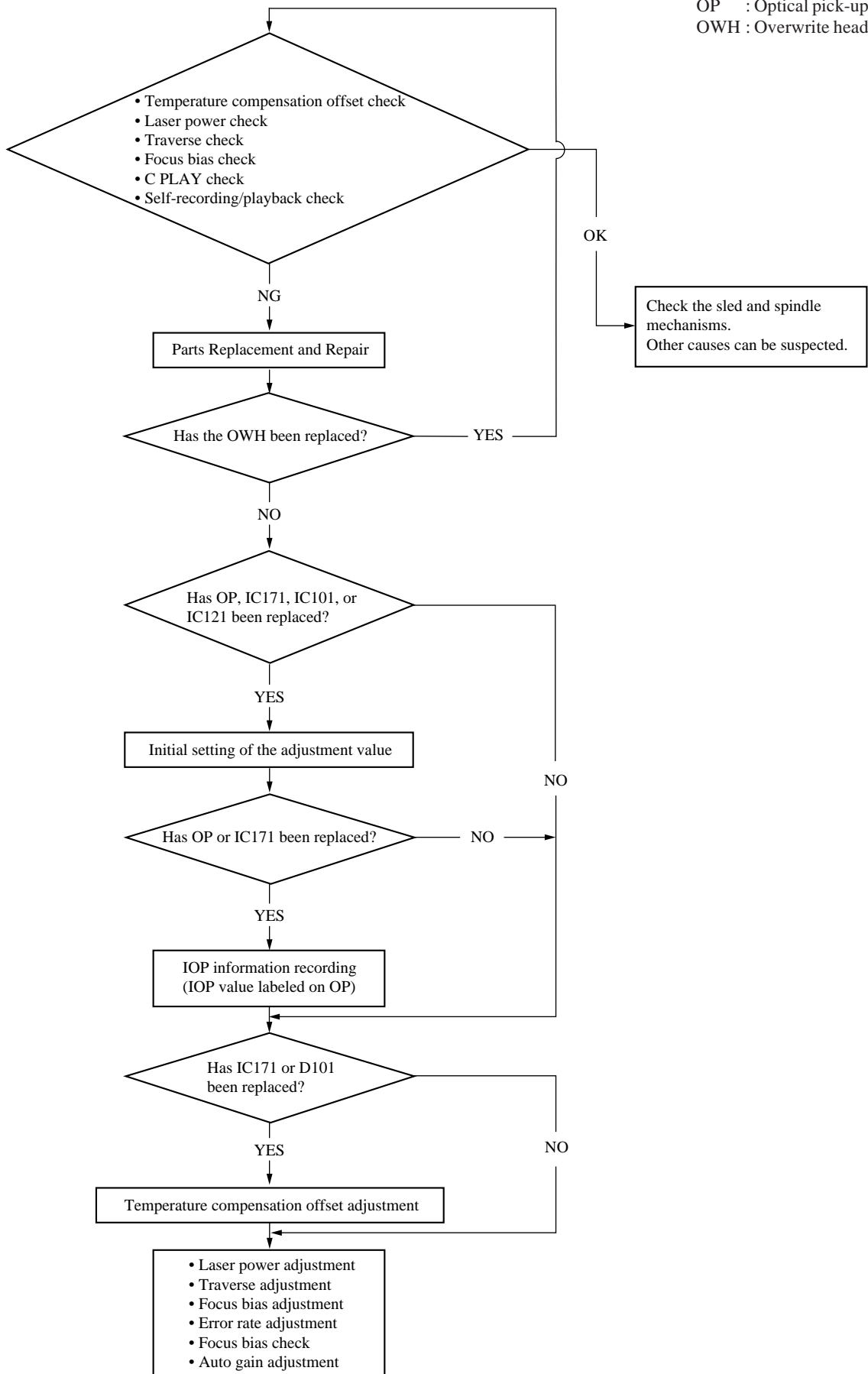
**Note:** MD always plays double speed.

### 1. PARTS REPLACEMENT AND ADJUSTMENT

- Check and adjust the mechanism deck as follows.

The procedure changes according to the part replaced

- Abbreviation  
OP : Optical pick-up  
OWH : Overwrite head

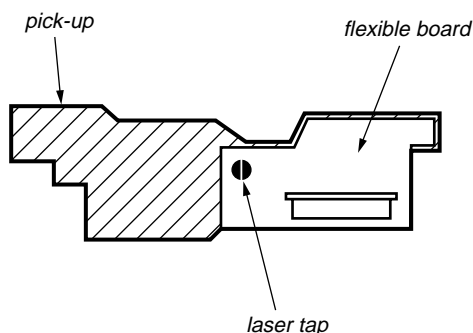


## 2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

## 3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-262A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



**Optical pick-up flexible board**

## 4. PRECAUTIONS FOR ADJUSTMENTS

- When replacing the following parts, perform the adjustments and checks with ○ in the order shown in the following table.

	Optical Pick-up	BD (MD) Board			
		IC171	D101	IC101, IC121	IC192
1. Initial setting of adjustment value	○	○	×	○	×
2. Recording of IOP information (Value on the optical pick-up label)	○	○	×	×	×
3. Temperature compensation offset adjustment	×	○	○	×	×
4. Laser power adjustment	○	○	×	○	○
5. Traverse adjustment	○	○	×	○	×
6. Focus bias adjustment	○	○	×	○	×
7. Error rate check	○	○	×	○	×
8. Auto gain output level adjustment	○	○	×	○	×

- Set the test mode when performing adjustments. After completing the adjustments, release the test mode. Perform the adjustments and checks in “group S” of the test mode.
- Perform the adjustments to be needed in the order shown.

- Use the following tools and measuring devices.
  - Check Disc (MD) TDYS-1 (Part No. 4-963-646-01)
  - Test Disc (MDW-74/AU-1) (Part No. 8-892-341-41)
  - Laser power meter LPM-8001 (Part No. J-2501-046-A) or MD Laser power meter 8010S (Part No. J-2501-145-A)
  - Oscilloscope (Measure after performing CAL of prove)
  - Digital voltmeter
  - Thermometer
  - Jig for checking BD (MD) board waveform (Part No. : J-2501-149-A)
- When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope. (VC and ground will become short-circuited)
- Using the above jig enables the waveform to be checked without the need to solder. (Refer to Servicing Notes on page 8)
- As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.





## Laser power meter

When performing laser power checks and adjustment (electrical adjustment), use of the new MD laser power meter 8010S (Part No. J-2501-145-A) instead of the conventional laser power meter is convenient.

It sharply reduces the time and trouble to set the laser power meter sensor onto the objective lens of optical pick-up.

## 5. CREATING CONTINUOUSLY-RECORDED DISC

\* This disc is used in focus bias adjustment and error rate check. The following describes how to create a continuous recording disc.

- Insert a disc (blank disc) commercially available.
- Turn the  (MD) knob and display “CREC MODE”. (C31)
- Press the  button again to display “CREC MID”. Display “CREC (0300)” and start to recording.
- Complete recording within 5 minutes.
- Press the  button and stop recording .
- Press the  button and remove the disc.

The above has been how to create a continuous recorded data for the focus bias adjustment/check and MO error rate check.

### Note :

- Be careful not to apply vibration during continuous recording.

## 6. CHECK PRIOR TO REPAIRS

These checks are performed before replacing parts according to “approximate specifications” to determine the faulty locations. For details, refer to “Checks Prior to Parts Replacement and Adjustments” (See page 10).

### 6-1. Temperature Compensation Offset Check

When performing adjustments, set the internal temperature and room temperature of 22 °C to 28 °C.

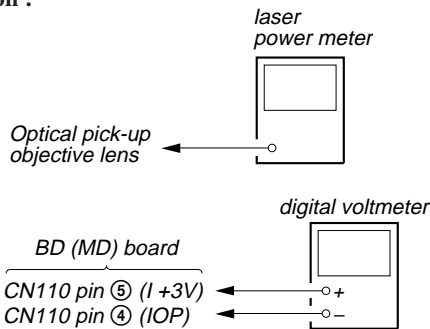
#### Checking Procedure:

1. Turn the  $\llcorner$  AMS  $\triangleright$  (MD) knob to display “TEMP CHECK” (C01).
2. Press the **YES** button.
3. “T=@(##) [OK]” should be displayed. If “T=@(##) [NG]” is displayed, it means that the results are bad.  
(@ indicates the current value set, and ## indicates the value written in the non-volatile memory)

### 6-2. Laser Power Check

Before checking, check the IOP value of the optical pick-up.  
(Refer to 8. Recording and Displaying IOP Information)

#### Connection :



#### Checking Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the  $\llcorner$  (MD) button or  $\triangleright$  (MD) button to move the optical pick-up) Connect the digital voltmeter to CN110 pin 5 (I+3V) and CN110 pin 4 (IOP) on the BD (MD) board.
2. Then, turn the  $\llcorner$  AMS  $\triangleright$  (MD) knob to display “LDPWR CHECK” (C02).
3. Press the **YES** button once to display “LD 0.9 mW \$ ”. Check that the reading of the laser power meter become 0.80 to 0.96 mW.
4. Press the **YES** (MD) button once more to display “LD 8.4 mW \$ ”. Check that the reading the laser power meter and digital voltmeter satisfy the specified value.

#### Specified Value:

Laser power meter reading: 8.4 ± 0.2 mW

Digital voltmeter reading : Value on the optical pick-up label ±10%

(Optical pick-up label)

KMS262A  
27X40  
B0825

IOP=82.5 mA in this case

$IOP (mA) = \text{Digital voltmeter reading (mV)} / 1 (\Omega)$

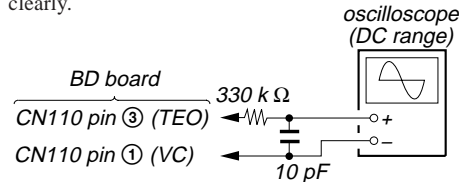
5. Press the **MENU/NO** button to display “LDPWR CHECK” and stop the laser emission.  
(The **MENU/NO** button is effective at all times to stop the laser emission)

**Note 1:** After step 4, each time the **YES** button is pressed, the display will be switched “LD 0.7 mW \$ ”, “LD 7.5 mW \$ ”, and “LD Wp ホセイ \$ ”. Nothing needs to be performed here.

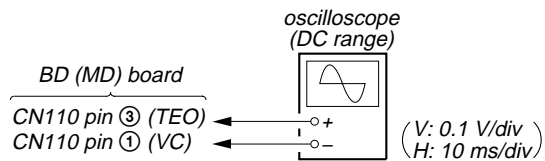
### 6-3. Traverse Check

**Note 1:** Data will be erased during MO reading if a recorded disc is used in this adjustment.

**Note 2:** If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



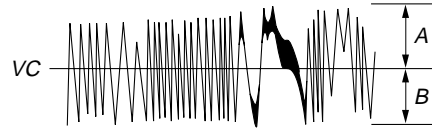
#### Connection :



#### Checking Procedure:

1. Connect an oscilloscope to CN110 pin 3 (TEO) and CN110 pin 1 (VC) on the BD (MD) board.
2. Load a disc (any available on the market). (Refer to Note 1)
3. Press the  $\triangleright$  (MD) button to move the optical pick-up outside the pit.
4. Turn the  $\llcorner$  AMS  $\triangleright$  (MD) knob to display “EF MO CHECK” (C03).
5. Press the **YES** button to display “EFB = MO-R”.  
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the  $\llcorner$  AMS  $\triangleright$  (MD) knob.  
(Read power traverse checking)

#### Traverse Waveform

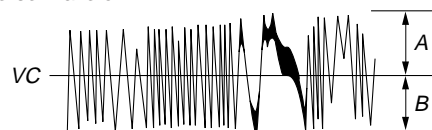


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

7. Press the **YES** button to display “EFB = MO-W”.
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the  $\llcorner$  AMS  $\triangleright$  (MD) knob.  
(Write power traverse checking)

#### Traverse Waveform



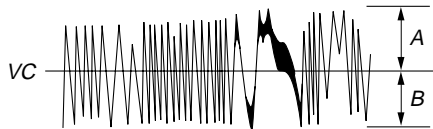
Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$



- Press the **[YES]** button to display "EFB =  MO-P". Then, the optical pick-up moves to the pit area automatically and servo is imposed.
- Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[<< AMS >>]** (MD) knob.

Traverse Waveform

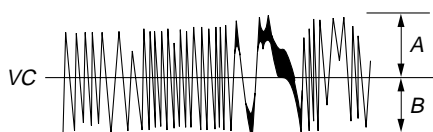


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

- Press the **[YES]** button to display "EF MO CHECK". The disc stops rotating automatically.
- Press the **[EJECT]** button and take out the disc.
- Load the check disc (MD) TDYS-1.
- Turn the **[<< AMS >>]** (MD) knob and display "EF CD CHECK" (C04).
- Press the **[YES]** button to display "EFB =  CD". Servo is imposed automatically.
- Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the **[<< AMS >>]** (MD) knob.

Traverse Waveform



Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2(A + B)} \times 100$$

- Press the **[YES]** button to display "EF CD CHECK".
- Press the **[EJECT]** button and take out the check disc.

#### 6-4. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

##### Checking Procedure :

- Load the test disk (MDW-74/AU-1).
- Turn the **[<< AMS >>]** (MD) knob to display "CPLAY MODE" (C30).
- Press the **[YES]** button twice to display "CPLAY MID".
- Press the **[MENU/NO]** button when "C =  AD =  is displayed.
- Turn the **[<< AMS >>]** (MD) knob to display "FBIAS CHECK" (C05).
- Press the **[YES]** button to display "/c = ". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value. Check that the C1 error is below 50 and ADER is below 2.
- Press the **[YES]** button to display "/b = ". Check that the C1 error is about 200 and ADER is below 2.
- Press the **[YES]** button to display "/a = ". Check that the C1 error is about 200 and ADER is below 2.
- Press the **[MENU/NO]** button, then press the **[EJECT]** button and take out the test disc.

#### 6-5. C PLAY Check

##### MO Error Rate Check

##### Checking Procedure :

- Load the test disk (MDW-74/AU-1).
- Turn the **[<< AMS >>]** (MD) knob to display "CPLAY MODE" (C30).
- Press the **[YES]** button to display "CPLAY MID".
- The display changes to "C =  AD = ".
- If the C1 error rate is below 80, check that ADER is below 2.
- Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the test disc.

##### CD Error Rate Check

##### Checking Procedure :

- Load the check disc (MD) TDYS-1.
- Turn the **[<< AMS >>]** (MD) knob to display "CPLAY MODE" (C30).
- Press the **[YES]** button twice to display "CPLAY MID".
- The display changes to "C =  AD = ".
- Check that the C1 error rate is below 50.
- Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the check disc.

#### 6-6. Self-Recording/playback Check

Prepare a continuous recording disc using the unit to be repaired and check the error rate.

##### Checking Procedure :

- Load a recordable disc (blank disc).
- Turn the **[<< AMS >>]** (MD) knob to display "CREC MODE" (C31).
- Press the **[YES]** button to display "CREC MID".
- When recording starts, lights up "**REC**" and display "CREC @@@@" (@@@@ is the address).
- About 1 minute later, press the **[MENU/NO]** button to stop continuous recording.
- Turn the **[<< AMS >>]** (MD) knob to display "CPLAY MODE" (C30).
- Press the **[YES]** button to display "CPLAY MID".
- "C =  AD =  will be displayed.
- Check that the C1 error becomes below 80 and the AD error below 2.
- Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the disc.

## 7. INITIAL SETTING OF ADJUSTMENT VALUE



### Note:

Mode which sets the adjustment results recorded in the non-volatile memory to the initial setting value. However the results of the temperature compensation offset adjustment will not change to the initial setting value.

If initial setting is performed, perform all adjustments again excluding the temperature compensation offset adjustment.

For details of the initial setting, refer to "4. Precautions on Adjustments" and execute the initial setting before the adjustment as required.



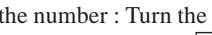
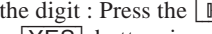


### Setting Procedure :

1. Turn the  (MD) knob to display "ADJ CLEAR" (C24).
2. Press the  button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" will be displayed.


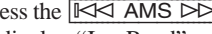

## 8. RECORDING AND DISPLAYING THE IOP INFORMATION

The IOP data can be recorded in the non-volatile memory. The IOP value on the optical pick-up label and the IOP value after the adjustment will be recorded. Recording these data eliminates the need to read the label on the optical pick-up.

### Recording Procedure :

1. Turn the  (MD) knob to display "Iop Write" (C28), and press the  button.
2. The display becomes Ref=@@.@ (@ is an arbitrary number) and the numbers which can be changed will blink.
3. Input the IOP value on the optical pick-up label.  
To select the number : Turn the  (MD) knob.  
To select the digit : Press the  (MD) knob
4. When the  button is pressed, the display becomes "Measu=@@.@@" (@ is an arbitrary number).
5. As the adjustment results are recorded for the 6 value. Leave it as it is and press the  button.
6. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

### Display Procedure :

1. Turn the  (MD) knob to display "Iop Read" (C27).
2. "@@.@/##.#" is displayed and the recorded contents are displayed.  
@@.@ indicates the IOP value on the optical pick-up label.  
##.# indicates the IOP value after adjustment
3. To end, press the  (MD) button or  button to display "Iop Read".





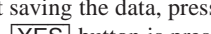



## 9. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.


### Note :

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature of 22 °C to 28 °C.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

### Adjusting Procedure :

1. Turn the  (MD) knob to display "TEMP ADJUS" (C09).
2. Press the  button to select the "TEMP ADJUS" mode.
3. "TEMP =  [OK]" and the current temperature data will be displayed.
4. To save the data, press the  button.  
When not saving the data, press the  button.
5. When the  button is pressed, "TEMP =  SAVE" will be displayed and turned back to "TEMP ADJUS" display then.  
When the  button is pressed, "TEMP ADJUS" will be displayed immediately.

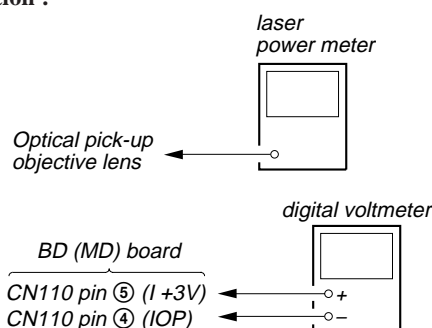
### Specified Value :

The "TEMP = " should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".



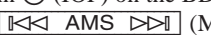






## 10. LASER POWER ADJUSTMENT

Check the IOP value of the optical pick-up before adjustments. (Refer to 8. Recording and Displaying IOP Information)

### Connection :



### Adjusting Procedure :

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the  (MD) button or  (MD) button to move the optical pick-up)  
Connect the digital voltmeter to CN110 pin 5 (I+3V) and CN110 pin 4 (IOP) on the BD (MD) board.
2. Turn the  (MD) knob to display "LDPWR ADJUS" (C10).  
(Laser power : For adjustment)
3. Press the  button once to display "LD 0.9 mW \$ ".
4. Turn the  (MD) knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the  button after setting the range knob of the laser power meter, and save the adjustment results. ("LD SAVE \$ ") will be displayed for a moment)
5. Then "LD 8.4 mW \$  will be displayed.

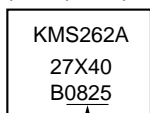
- Turn the  $\llcorner$ AMS $\triangleright$  (MD) knob so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the **YES** button to save it.
- Note:** Do not perform the emission with 7.0 mW more than 15 seconds continuously.
- Then, turn the  $\llcorner$ AMS $\triangleright$  (MD) knob to display "LDPWR CHECK" (C02).
- Press the **YES** button once to display "LD 0.9 mW \$  $\square\square\square$ ". Check that the reading of the laser power meter become 0.85 to 0.91 mW.
- Press the **YES** button once more to display "LD 8.4 mW \$  $\square\square\square$ ". Check that the reading of the laser power meter and digital voltmeter satisfy the specified value.  
Note down the digital voltmeter reading value.

**Specified Value:**

Laser power meter reading:  $8.4 \pm 0.2$  mW

Digital voltmeter reading : Value on the optical pick-up label  $\pm 10\%$

(Optical pick-up label)



IOP=82.5 mA in this case

$$IOP (mA) = \text{Digital voltmeter reading (mV)} / 1 (\Omega)$$

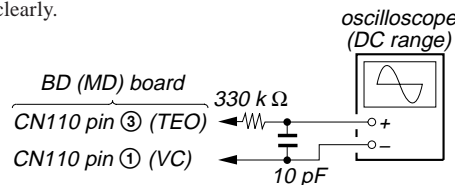
- Press the **MENU/NO** button to display "LDPWR CHECK" and stop the laser emission.  
(The **MENU/NO** button is effective at all times to stop the laser emission.)
- Turn the  $\llcorner$ AMS $\triangleright$  (MD) knob to display "Iop Write" (C28).
- Press the **YES** button. When the display becomes Ref=@@.@ (@ is an arbitrary number), press the **YES** button to display "Measu=@@.@" (@ is an arbitrary number).
- The numbers which can be changed will blink. Input the Iop value noted down at step 9.  
To select the number : Turn the  $\llcorner$ AMS $\triangleright$  (MD) knob.  
To select the digit : Press the  $\llcorner$ AMS $\triangleright$  (MD) knob.
- When the **YES** button is pressed, "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

**Note 1:** After step 4, each time the **YES** button is pressed, the display will be switched "LD 0.7 mW \$  $\square\square\square$ ", "LD 7.5 mW \$  $\square\square\square$ ", and "LD Wp ホセイ \$  $\square\square\square$ ". Nothing needs to be performed here.

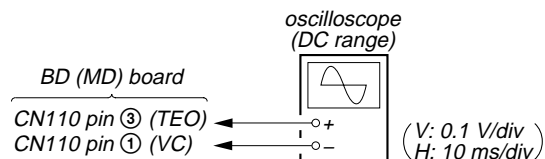
**11. TRAVERSE ADJUSTMENT**

**Note 1:** Data will be erased during MO reading if a recorded disc is used in this adjustment.

**Note 2:** If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



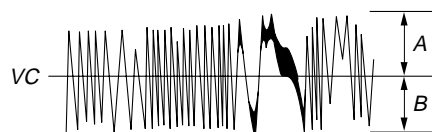
**Connection :**



**Adjusting Procedure :**

- Connect an oscilloscope to CN110 pin ③ (TEO) and CN110 pin ① (VC) on the BD (MD) board.
- Load a disc (any available on the market). (Refer to Note 1)
- Press the  $\triangleright$  (MD) button to move the optical pick-up outside the pit.
- Turn the  $\llcorner$ AMS $\triangleright$  (MD) knob to display "EF MO ADJUS" (C10).
- Press the **YES** button to display "EFB =  $\square\square\square$  MO-R".  
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
- Turn the  $\llcorner$ AMS $\triangleright$  (MD) knob so that the waveform of the oscilloscope becomes the specified value.  
(When the  $\llcorner$ AMS $\triangleright$  (MD) knob is turned, the  $\square\square\square$  of "EFB =  $\square\square\square$ " changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.  
(Read power traverse adjustment)

*Traverse Waveform*



Specification A = B

- Press the **YES** button and save the result of adjustment to the non-volatile memory ("EFB =  $\square\square\square$  SAV" will be displayed for a moment. Then "EFB =  $\square\square\square$  MO-W" will be displayed).



## 13. ERROR RATE CHECK

### 13-1. CD Error Rate Check

#### Checking Procedure :

1. Load the check disc (MD) TDYS-1.
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob and display “CPLAY MODE” (C30).
3. Press the **[YES]** button twice and display “CPLAY MID”.
4. The display changes to “C = [ ] AD = [ ]”.
5. Check that the C1 error rate is below 20.
6. Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the check disc.

### 13-2. MO Error Rate Check

#### Checking Procedure :

1. Load the continuously-recorded disc. (Refer to “5. CREATING CONTINUOUSLY-RECORDED DISC”)
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “CPLAY MODE” (C30).
3. Press the **[YES]** button to display “CPLAY MID”.
4. The display changes to “C1 = [ ] AD = [ ]”.
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the **[MENU/NO]** button to stop playback, then press the **[EJECT]** button and take out the test disc.

## 14. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

#### Checking Procedure :

1. Load the continuously-recorded disc. (Refer to “5. CREATING CONTINUOUSLY-RECORDED DISC”)
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “CPLAY MODE” (C30).
3. Press the **[YES]** button twice to display “CPLAY MID”.
4. Press the **[MENU/NO]** button when “C = [ ] AD = [ ]” is displayed.
5. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “FBIAS CHECK” (C05).
6. Press the **[YES]** button to display “[ ]/[ ] c = [ ]”.  
The first four digits indicate the C1 error rate, the two digits after [ / ] indicate ADER, and the 2 digits after [ c = ] indicate the focus bias value.  
Check that the C1 error is below 50 and ADER is below 2.
7. Press the **[YES]** button and display “[ ]/[ ] b = [ ]”.  
Check that the C1 error is about 200 and ADER is below 2.
8. Press the **[YES]** button and display “[ ]/[ ] a = [ ]”.  
Check that the C1 error is about 200 and ADER is below 2.
9. Press the **[MENU/NO]** button, then press the **[EJECT]** button and take out the disc.

**Note 1:** If the C1 error and ADER are above other than the specified value at points A (step 8. in the above) or B (step 7. in the above), the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

## 15. AUTO GAIN CONTROL OUTPUT LEVEL ADJUSTMENT

Be sure to perform this adjustment when the optical pick-up is replaced.

If the adjustment results becomes “Adjust NG!”, the optical pick-up may be faulty or the servo system circuits may be abnormal.

### 15-1. CD Auto Gain Control Output Level Adjustment

#### Adjusting Procedure :

1. Load the check disc (MD) TDYS-1.
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “AG Set (CD)” (C26).
3. When the **[YES]** button is pressed, the adjustment will be performed automatically.  
“Complete!!” will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to “AG Set (CD)”.
4. Press the **[EJECT]** button and take out the check disc.

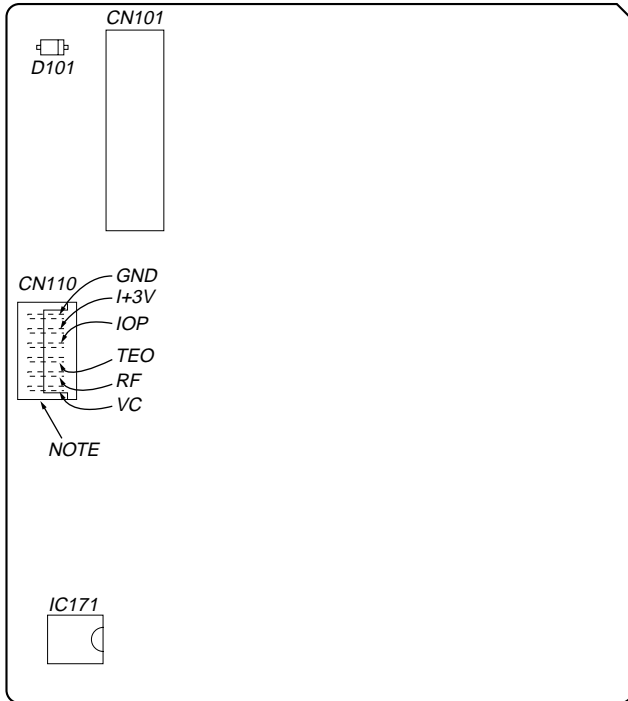
### 15-2. MO Auto Gain Control Output Level Adjustment

#### Adjusting Procedure :

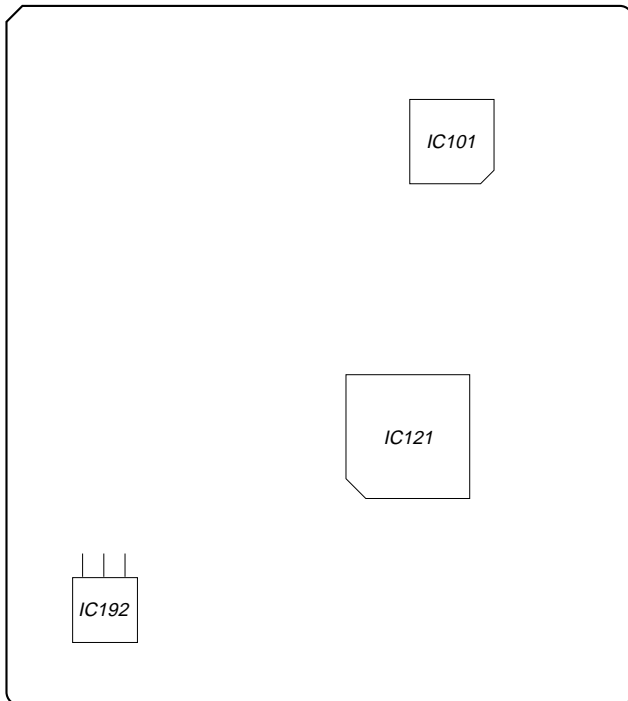
1. Load the test disc (MDW-74/AU-1).
2. Turn the **[◀◀ AMS ▶▶]** (MD) knob to display “AG Set (MO)” (C25).
3. When the **[YES]** button is pressed, the adjustment will be performed automatically.  
“Complete!!” will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to “AG Set (MO)”.
4. Press the **[EJECT]** button and take out the test disc.

**Adjustment Location:**

**– BD (MD) BOARD (Side A) –**



**– BD (MD) BOARD (Side B) –**



**Note:** It is useful to use the jig for checking the waveform. (Refer to Servicing Notes on page 8)



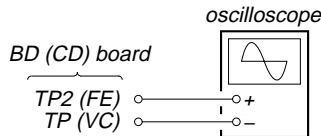
## CD SECTION

### Note:

1. CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than  $10M\Omega$  impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Level doesn't change whichever with normal speed or with four times speed.

### S Curve Check

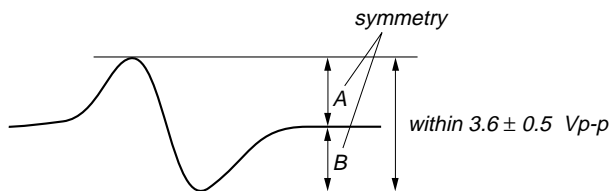
#### Connection:



#### Procedure :

1. Connect oscilloscope to test point TP (FE) and TP (VC) on BD (CD) board.
2. Mount  $0\ \Omega$  resistor or short at R147 on BD (CD) board.
3. Turn ON the power.
4. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within  $3.6 \pm 0.5$  Vp-p.

#### S-curve waveform



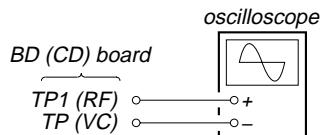
6. After check, remove the lead wire connected in step 2.

**Note :**

- Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

### RF Level Check

#### Connection:

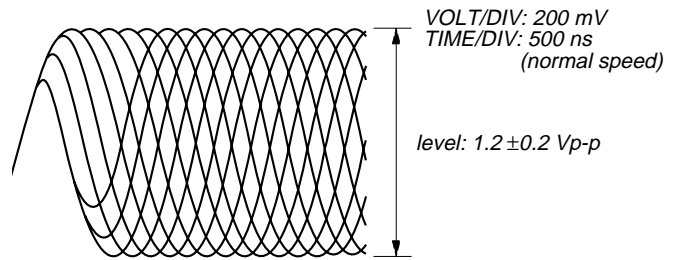


#### Procedure :

1. Connect oscilloscope to test point TP (RFO) and TP (VC) on BD (CD) board.
2. Turn ON the power.
3. Put disc (YEDS-18) in to play the number five track.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

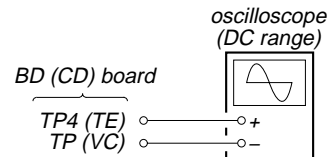
**Note:** A clear RF signal waveform means that the shape “ $\diamond$ ” can be clearly distinguished at the center of the waveform.

#### RF signal waveform



### E-F Balance Check

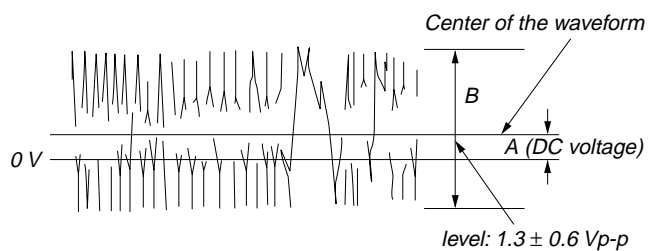
#### Connection:



#### Procedure :

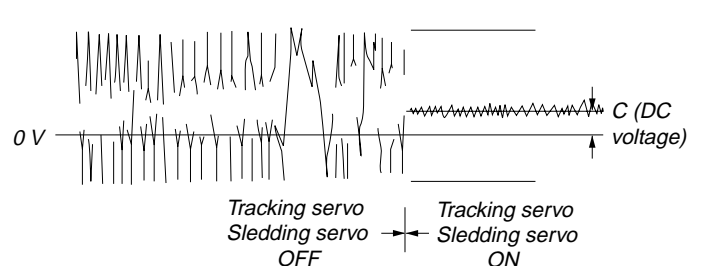
1. Connect the test point TP (ADJ) on MAIN board to the ground with a lead wire on MAIN board.
2. Connect oscilloscope to test point TP (TE) and TP (VC) on BD (CD) board.
3. Turn ON the power to set the ADJ mode.
4. Put disc (YEDS-18) in to play the number five track.
5. Press the [◀◀ AMS ▶▶] (CD) knob to display “A> TRK ON” at the CD test mode. (The tracking servo and the sledding servo are turned OFF)
6. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform. Confirm the following :  
 $A/B \times 100 = \text{less than } \pm 22\%$

#### Traverse waveform



7. Press the [◀◀ AMS ▶▶] (CD) knob. (The tracking servo and sledding servo are turned ON)  
 Confirm the C (DC voltage) is almost equal to the A (DC voltage) is step 6.

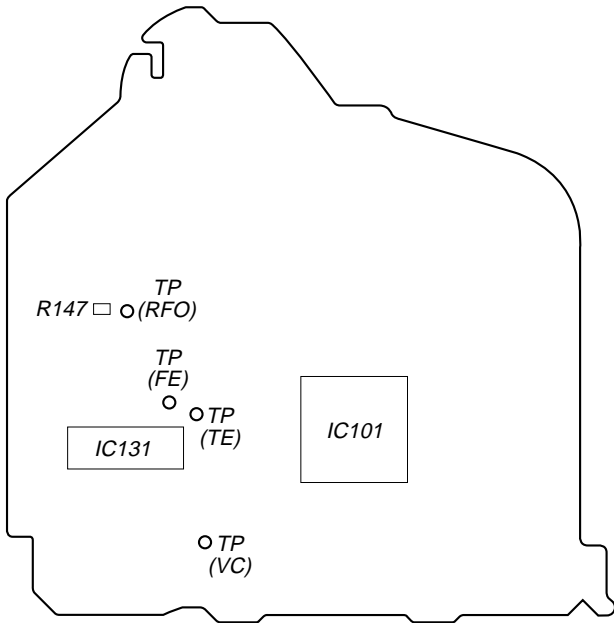
#### Traverse waveform



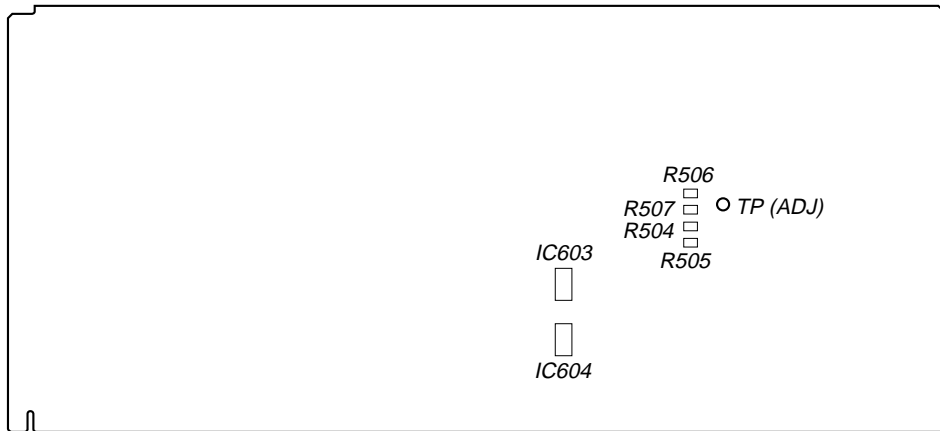
8. Disconnect the lead wire of TP (ADJ) connected in step 1.

**Adjustment Location:**

**- BD (CD) BOARD (SIDE A) -**



**- MAIN BOARD (SIDE B) -**





## SECTION 6 DIAGRAMS

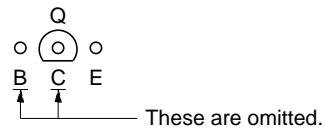
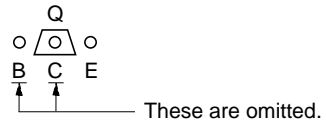
### 6-1. NOTE FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS (In addition to this, the necessary note is printed in each block)

#### Note on Printed Wiring Board:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Through hole.
- : Pattern from the side which enables seeing.

**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.

#### • Indication of transistor.



#### Note on Schematic Diagram:

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

#### Note:

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

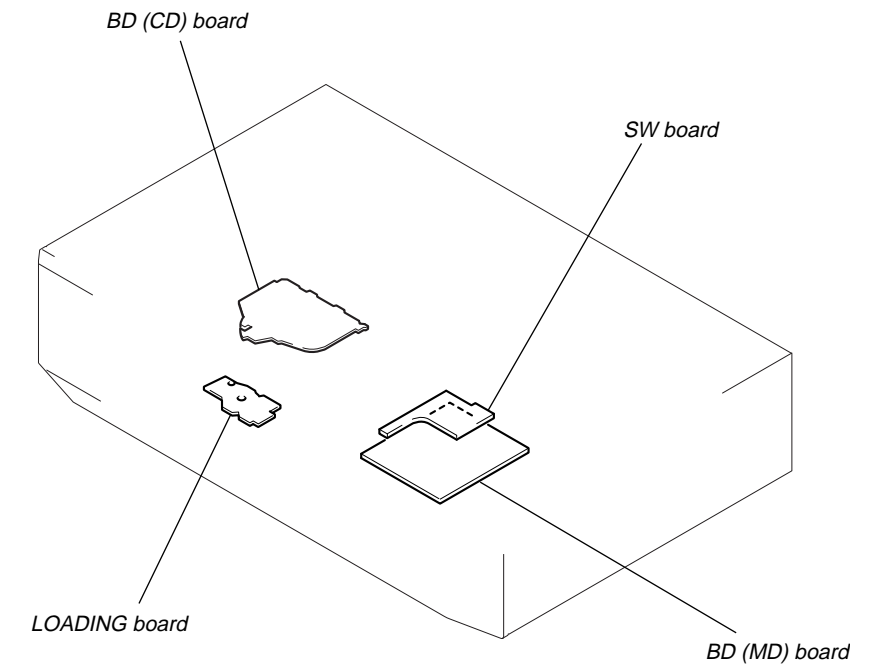
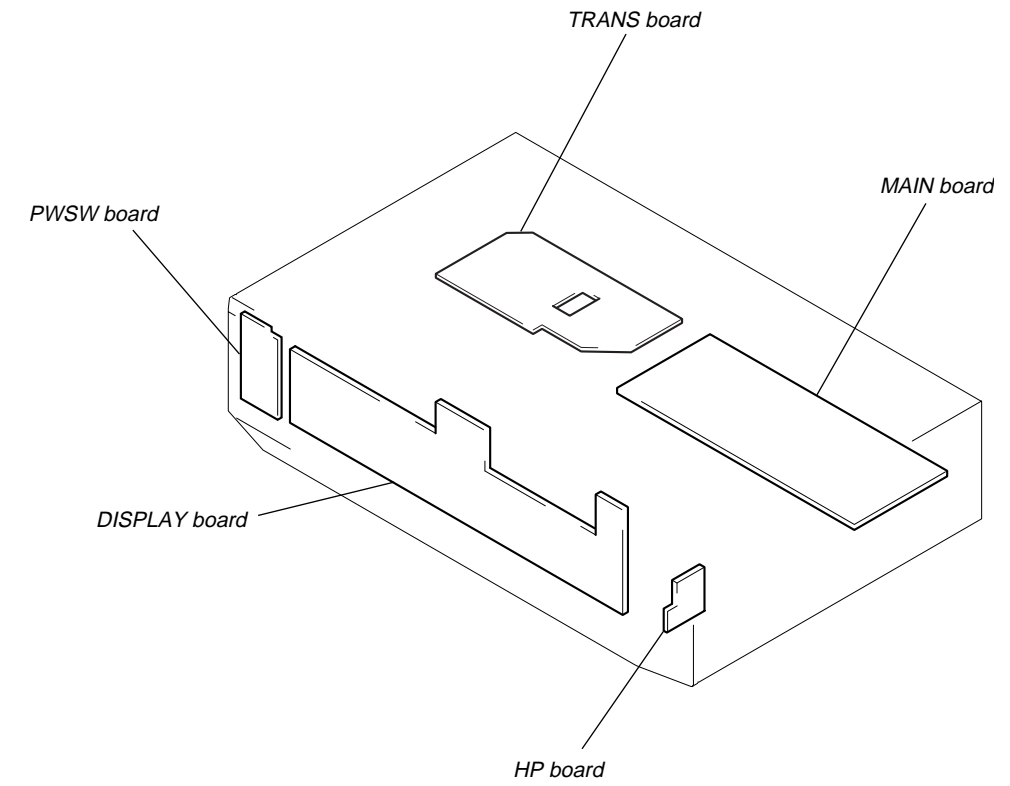
#### Note:

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

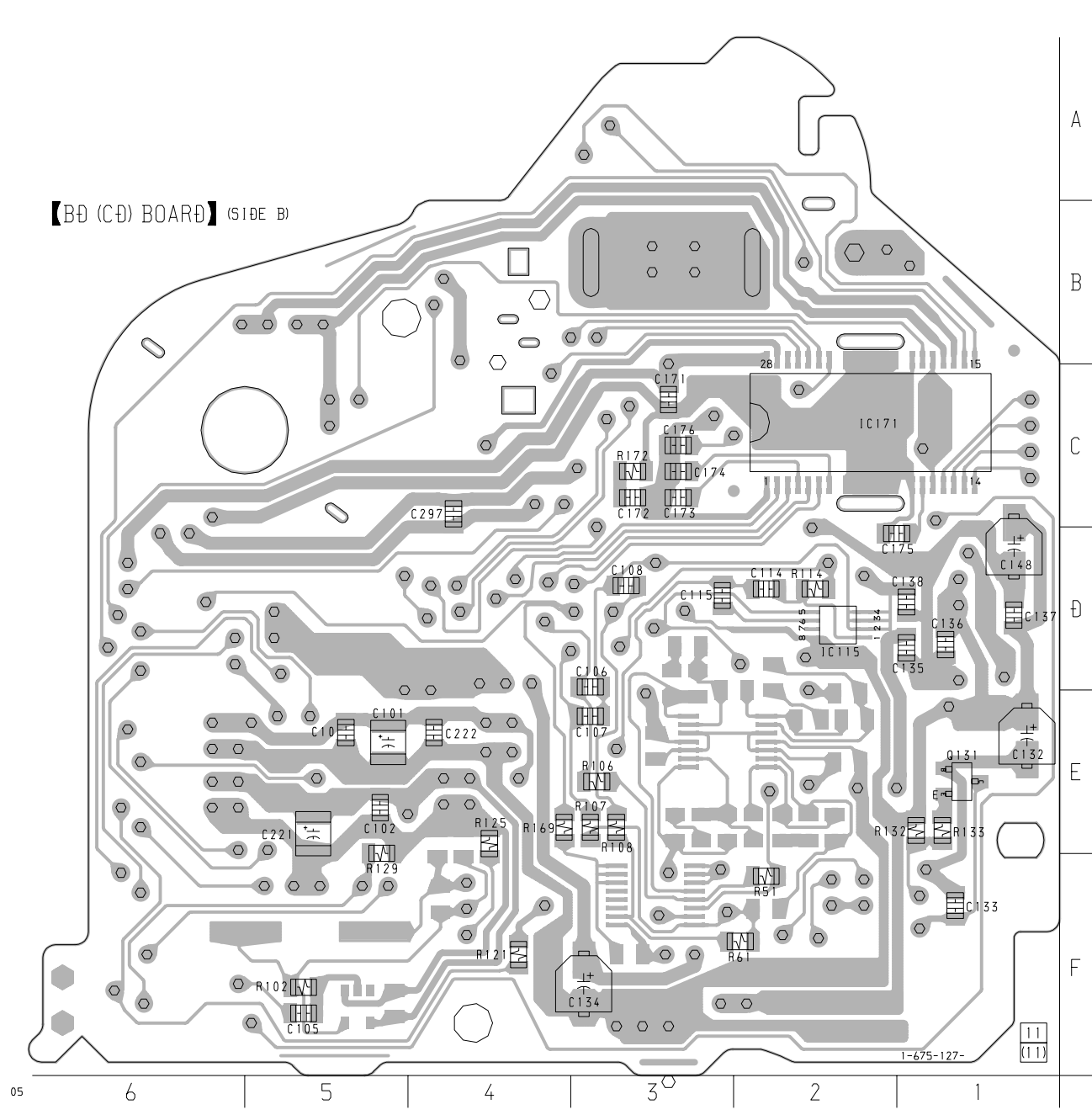
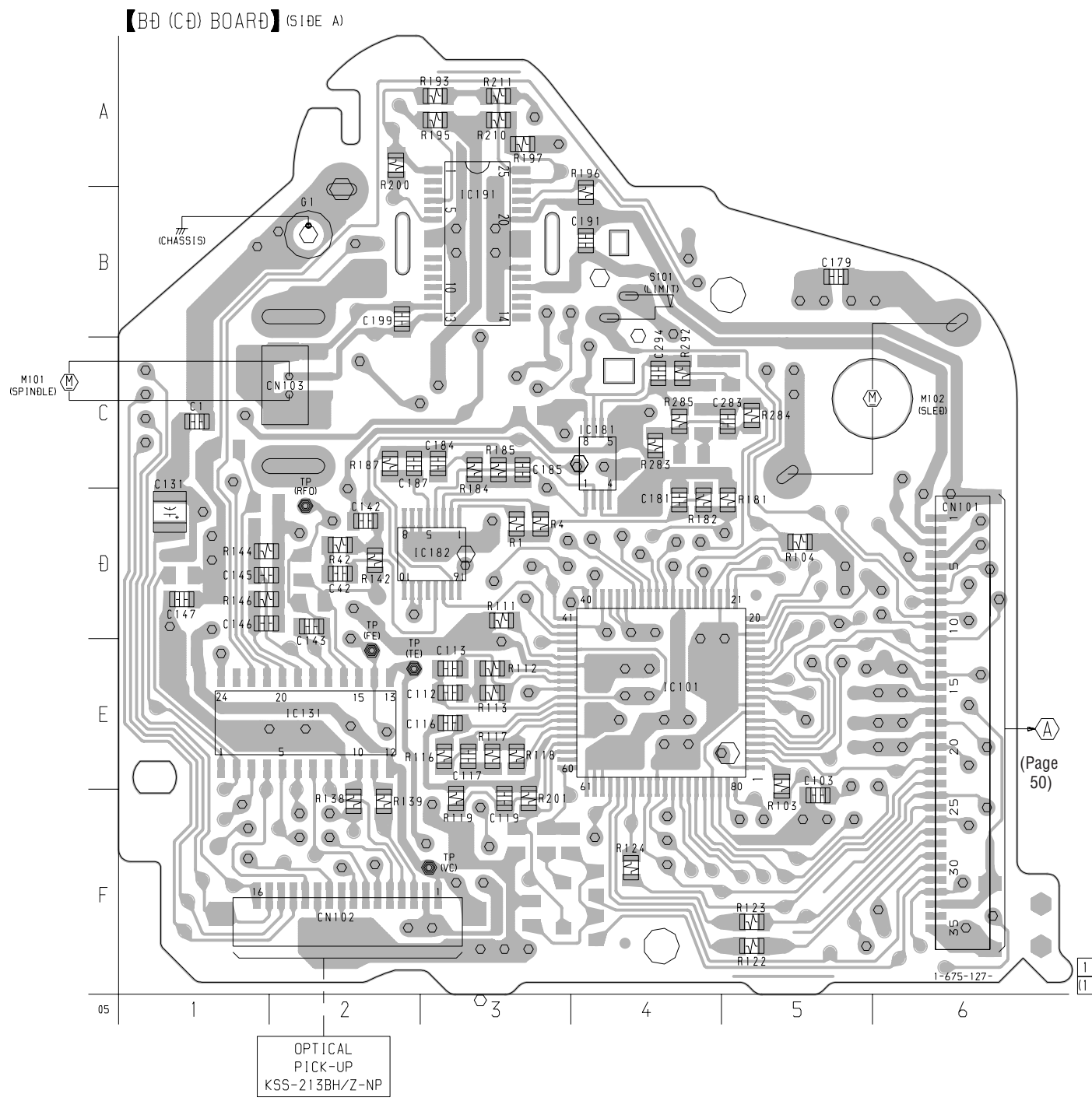
以阴影和  $\Delta$  标志来识别的零部件在安全方面具有关键性。因此只能以规定号码的零部件来更换。

- : B+ Line.
- : B- Line.
- Voltages are taken with a VOM (Input impedance  $10\text{ M}\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  - : CD PLAY
  - : MD PLAY
  - : MD REC

#### • Circuit Boards Location



6-2. PRINTED WIRING BOARD – BD (CD) Board – • See page 41 for Circuit Boards Location.



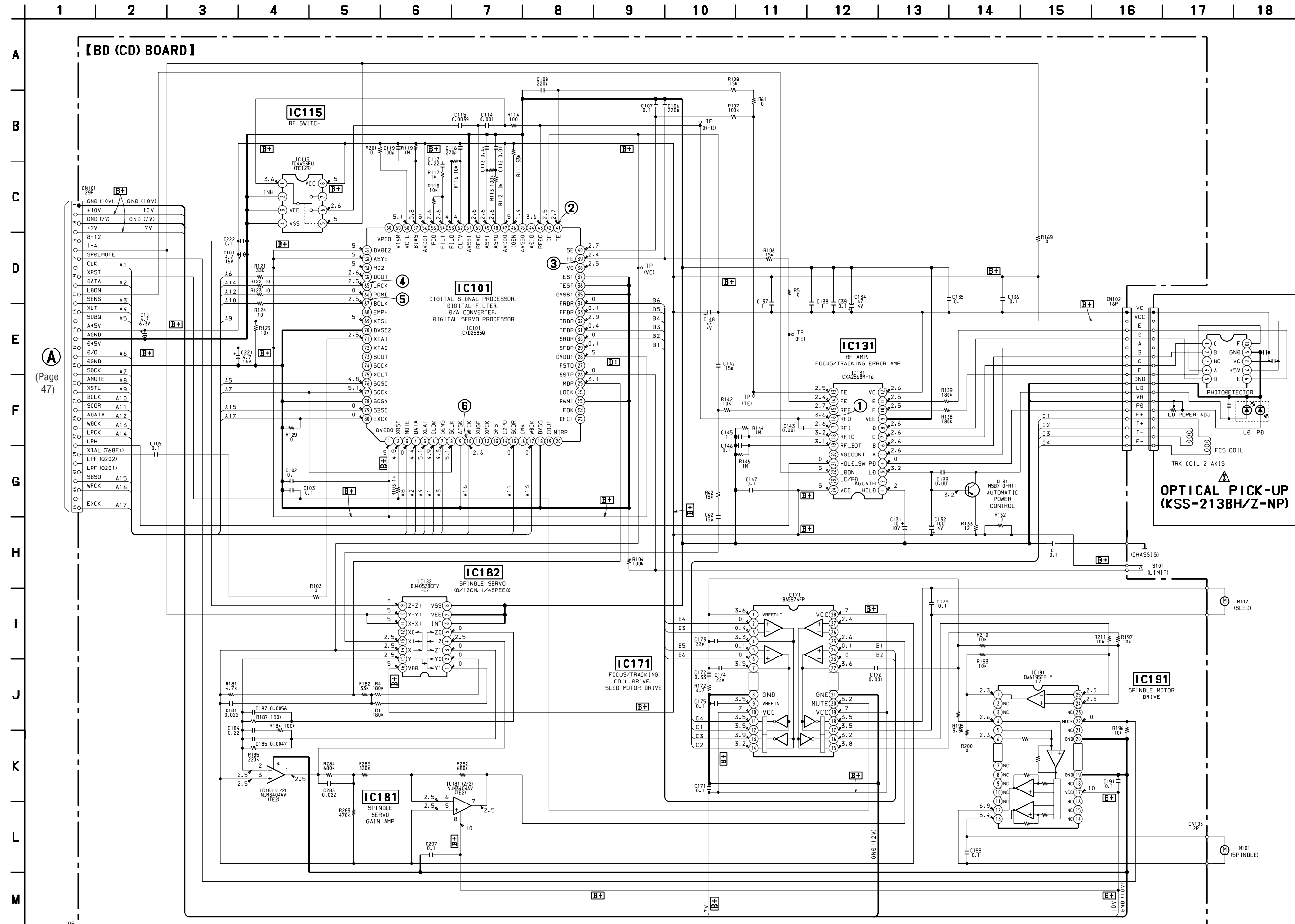
• Semiconductor Location (Side A)

Ref. No.	Location
IC101	E-4
IC131	E-2
IC181	C-4
IC182	D-3
IC191	B-3

• Semiconductor Location (Side B)

Ref. No.	Location
IC115	D-2
IC171	C-2
Q131	E-1

6-3. SCHEMATIC DIAGRAM – BD (CD) Board – • See page 56 for Waveforms. • See page 57 for IC Block Diagrams.



(Page 47)

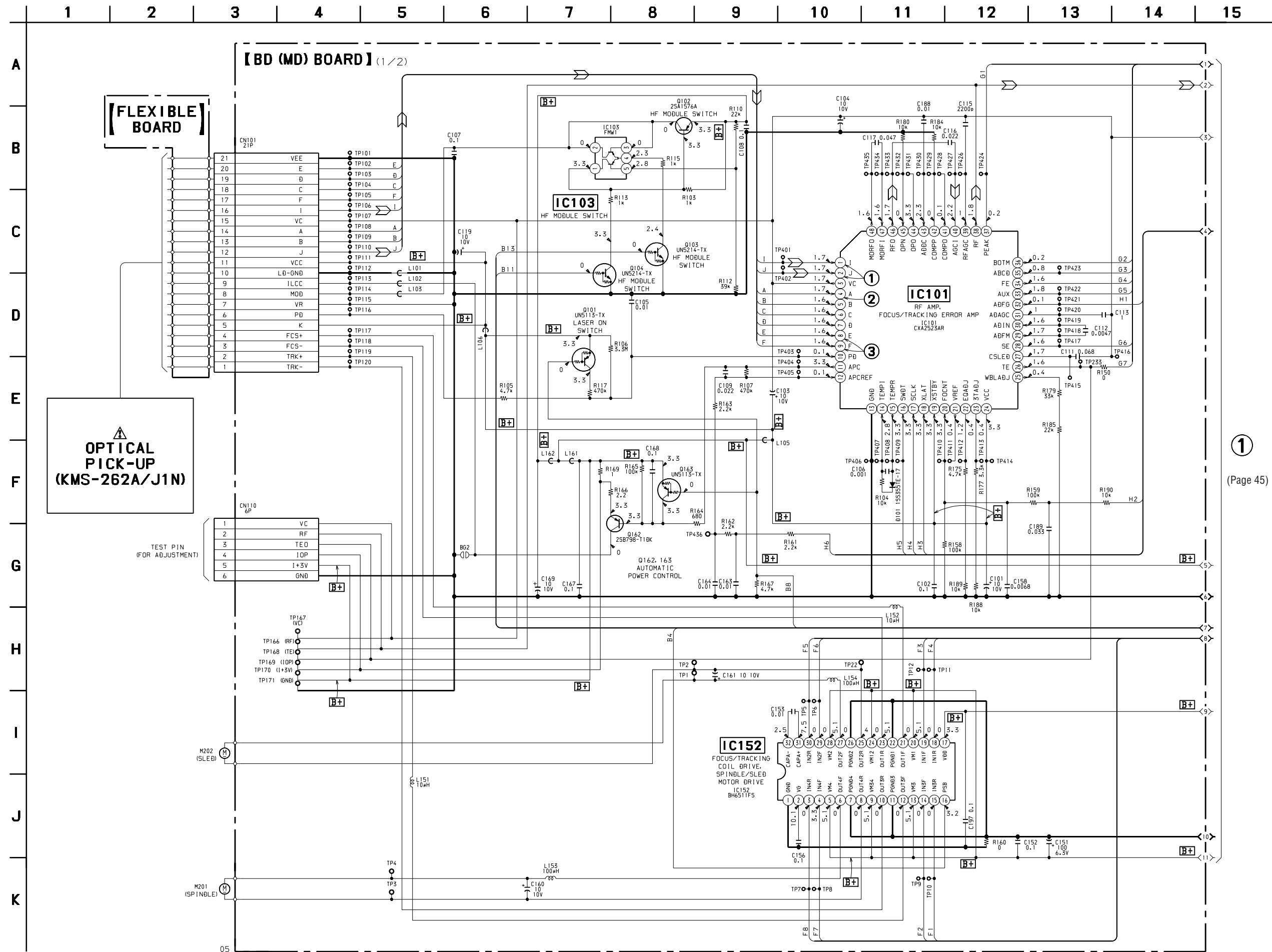
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

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

以阴影和 $\Delta$ 标志来识别的零部件在安全方面具有关键性。因此只能以规定号码的零部件来更换。

**Note on Schematic Diagram:**  
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.  
 no mark : CD PLAY

6-4. SCHEMATIC DIAGRAM – BD (MD) Board (1/2) – • See page 56 for Waveforms. • See page 59 for IC Block Diagrams.



**OPTICAL PICK-UP (KMS-262A/J1N)**

TEST PIN (FOR ADJUSTMENT)

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

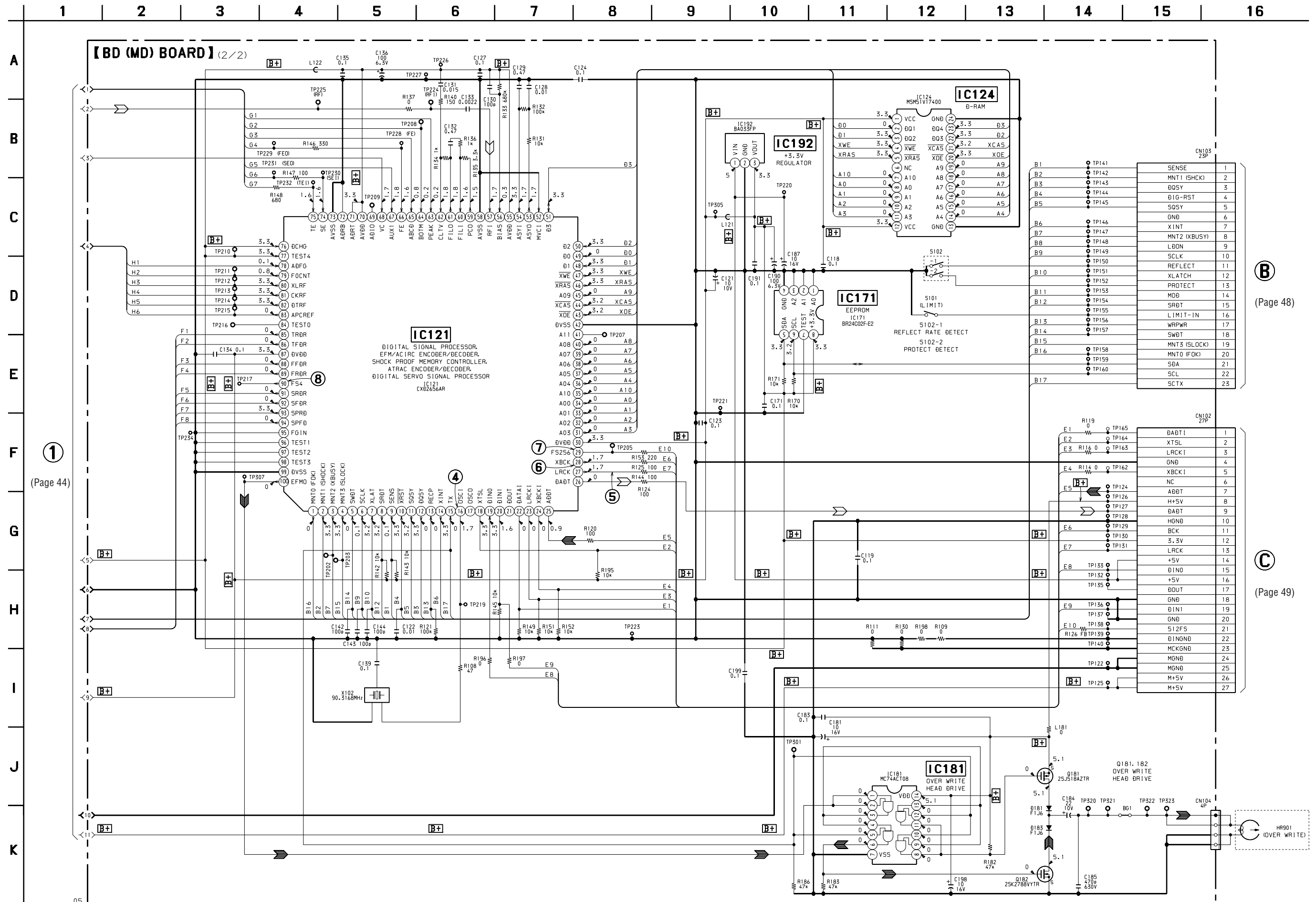
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

以阴影和 $\Delta$ 标志来识别的零部件在安全方面具有关键性。因此只能以规定号码的零部件来更换。

**Note on Schematic Diagram:**  
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.  
 no mark : MD STOP

① (Page 45)

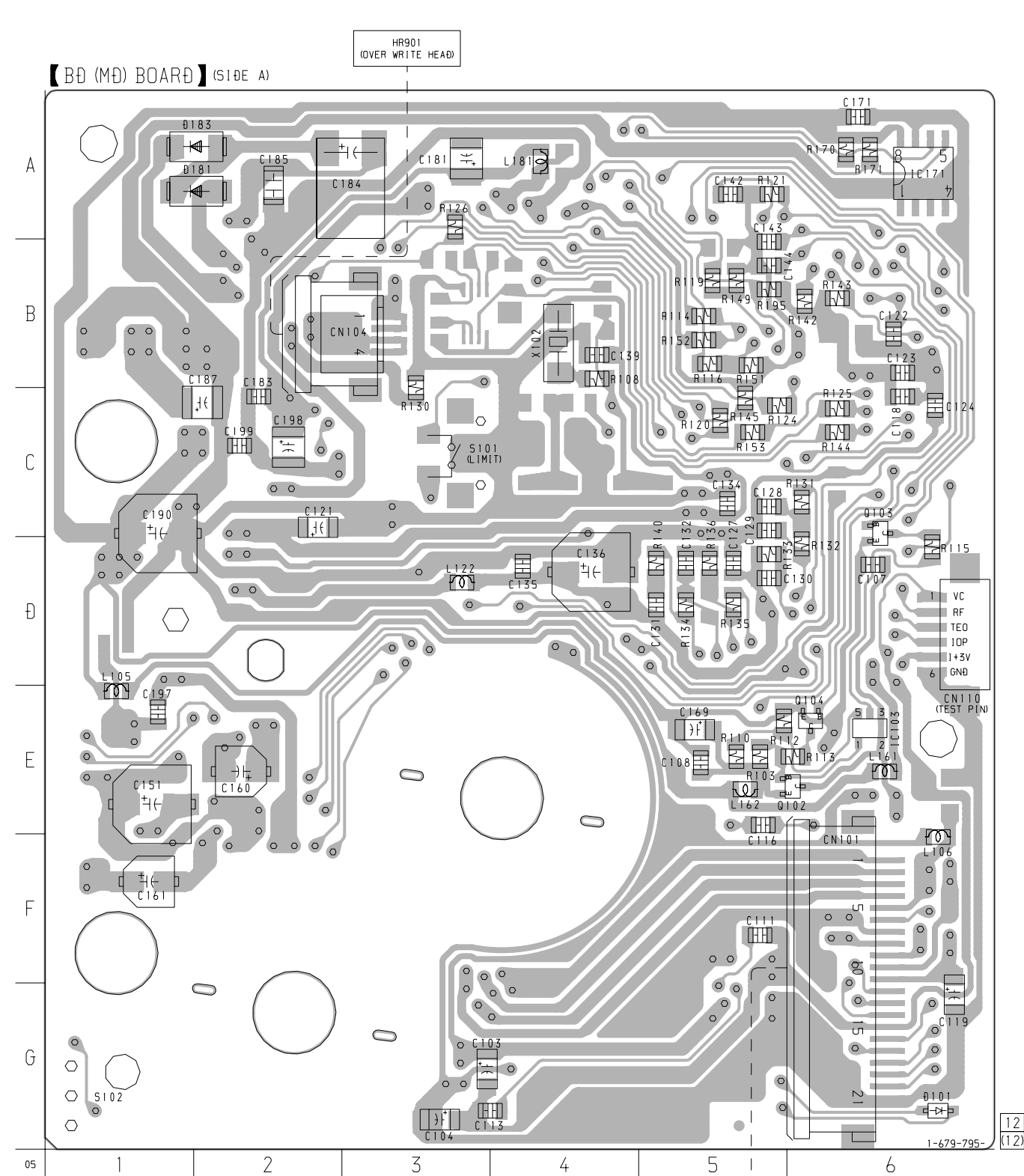
6-5. SCHEMATIC DIAGRAM – BD (MD) Board (2/2) – • See page 56 for Waveforms. • See page 60 for IC Block Diagrams.



**Note on Schematic Diagram:**  
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.  
 no mark : MD STOP



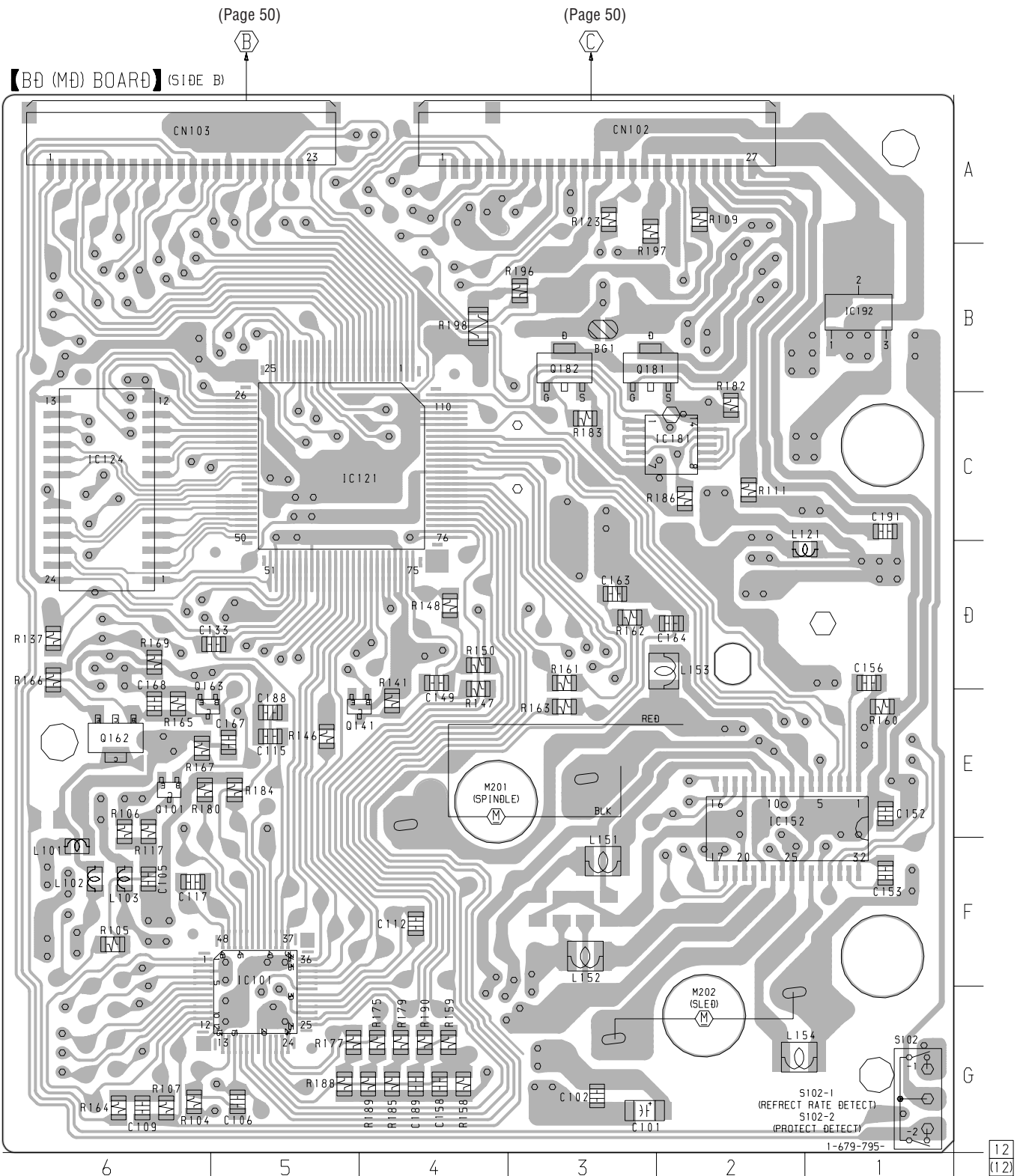
6-6. PRINTED WIRING BOARD – BD (MD) Board – • See page 41 for Circuit Boards Location.



• Semiconductor Location (Side A)

Ref. No.	Location
D101	G-6
D181	A-2
D183	A-2
IC103	E-6
IC171	A-6
Q102	E-6
Q103	C-6
Q104	E-6

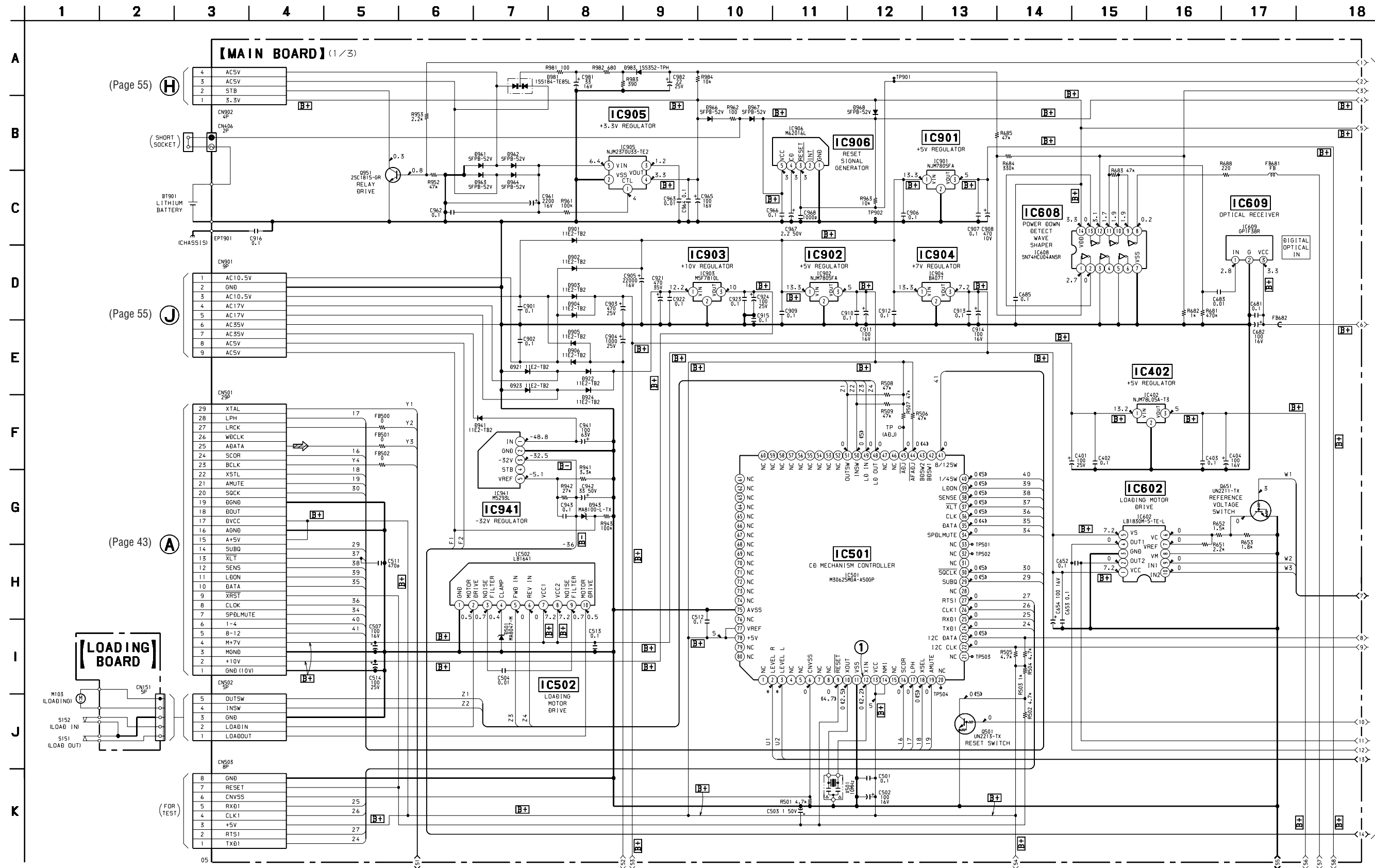
OPTICAL PICK-UP  
KMS-262A/J1N



• Semiconductor Location (Side B)

Ref. No.	Location
IC101	G-5
IC121	C-5
IC124	C-6
IC152	E-2
IC181	C-2
IC192	B-1
Q101	E-6
Q162	E-6
Q163	E-6
Q181	B-3
Q182	B-3

6-7. SCHEMATIC DIAGRAM – MAIN (1/3) / LOADING Boards – • See page 56 for Waveform. • See page 62 for IC Block Diagrams.



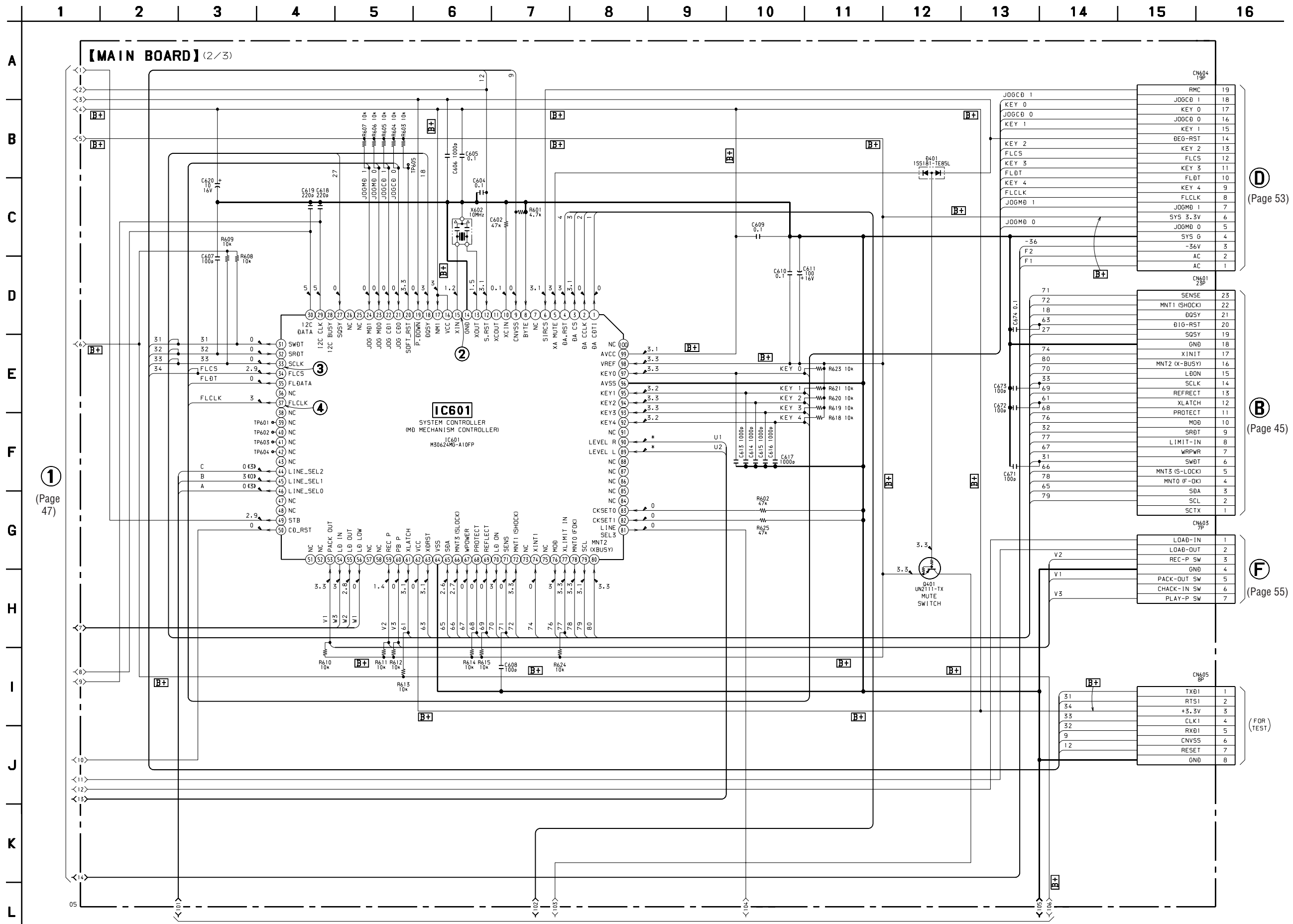
1 (Page 48)

2 (Page 49)

**Note on Schematic Diagram:**

- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : MD PLAY
- << >> : CD PLAY
- \* : Impossible to measure

6-8. SCHEMATIC DIAGRAM – MAIN Board (2/3) – • See page 56 for Waveforms.



(D) (Page 53)

(B) (Page 45)

(F) (Page 55)

(FOR TEST)

(1) (Page 47)

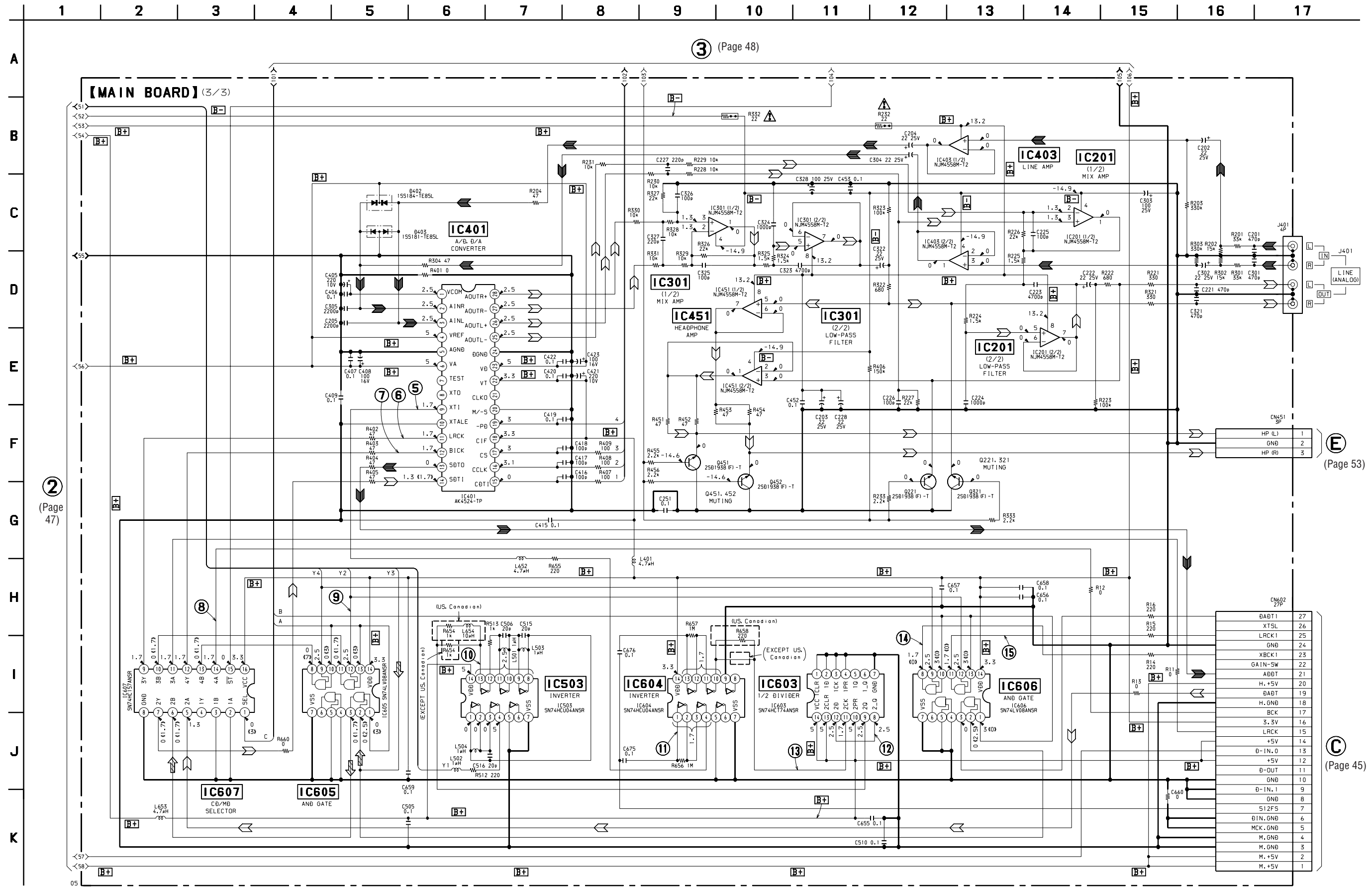
(3) (Page 49)

**Note on Schematic Diagram:**  
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.

no mark : MD PLAY  
 << >> : CD PLAY  
 \* : Impossible to measure



6-9. SCHEMATIC DIAGRAM – MAIN Board (3/3) – • See page 56 for Waveform. • See page 62 for IC Block Diagrams.



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

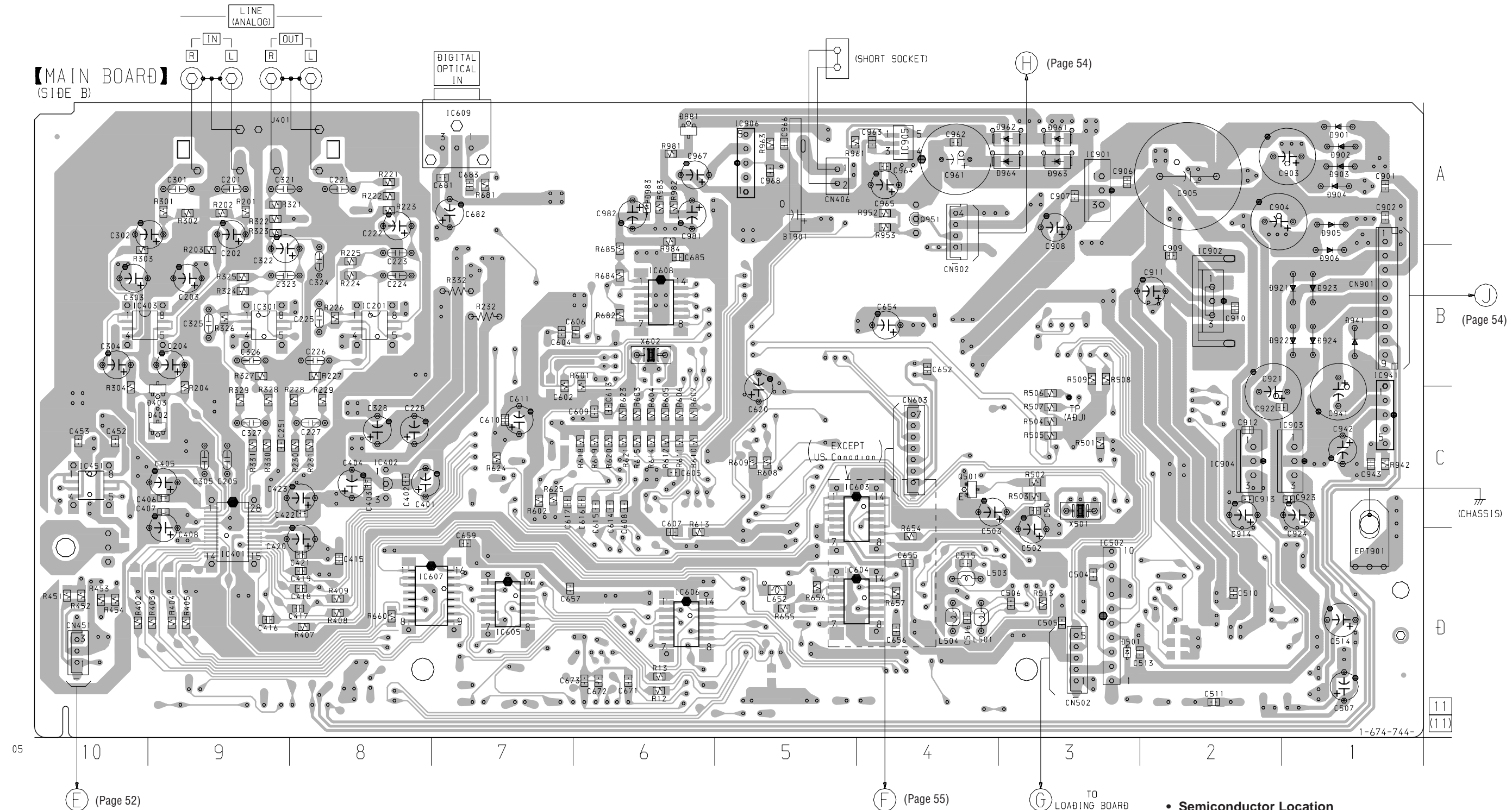
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

以阴影和  $\Delta$  标志来识别的零部件在安全方面具有关键性。因此只能以规定号码的零部件来更换。

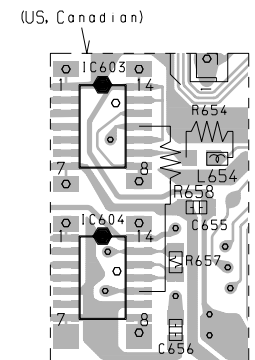
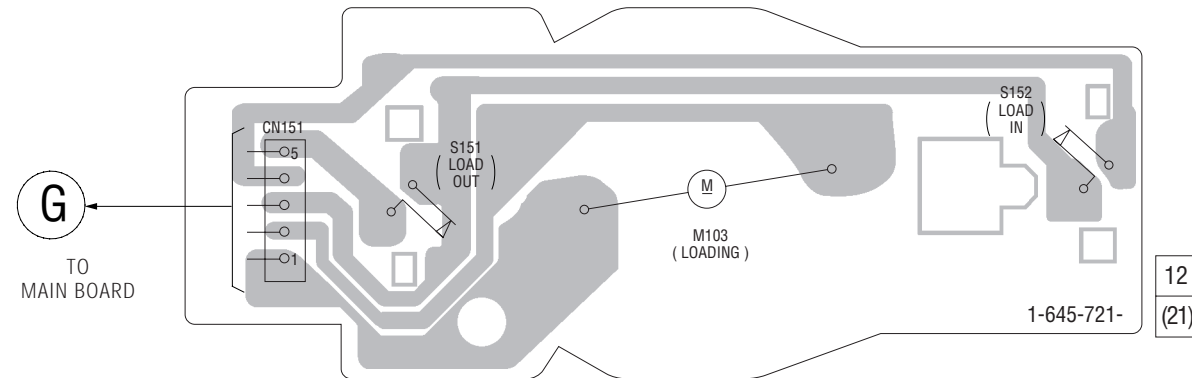
**Note on Schematic Diagram:**  
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.  
 no mark : MD PLAY  
 << >> : CD PLAY



6-11. PRINTED WIRING BOARDS – MAIN (Side B) / LOADING Boards – • See page 41 for Circuit Boards Location.



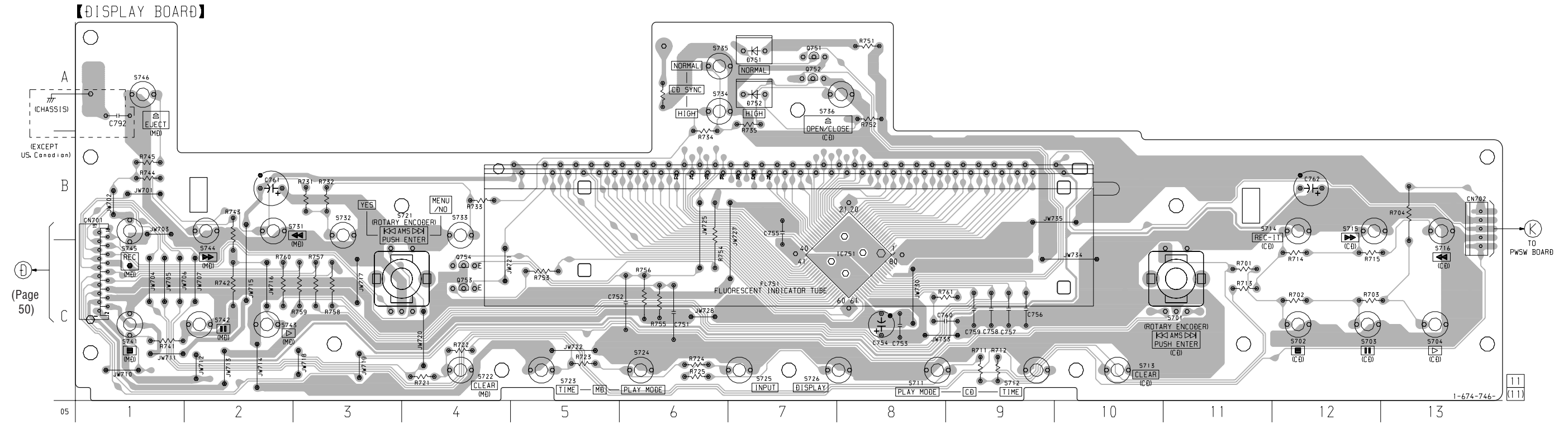
【LOADING BOARD】



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D402	C-9	D962	A-3	IC605	D-7
D403	C-9	D963	A-3	IC606	D-6
D501	D-3	D964	A-3	IC607	D-7
D901	A-1	D981	A-6	IC608	B-6
D902	A-1	D983	A-6	IC609	A-7
D903	A-1			IC901	A-3
D904	A-1	IC201	B-8	IC902	B-2
D905	A-1	IC301	B-9	IC903	C-1
D906	B-1	IC401	C-9	IC904	C-2
D921	B-1	IC402	C-8	IC905	A-4
D922	B-1	IC403	B-10	IC906	A-5
D923	B-1	IC451	C-10	IC941	C-1
D924	B-1	IC502	D-3		
D941	B-1	IC603	C-4	Q501	C-4
D961	A-3	IC604	D-4	Q951	A-4

6-12. PRINTED WIRING BOARDS – DISPLAY / PWSW / HP Boards – • See page 41 for Circuit Boards Location.

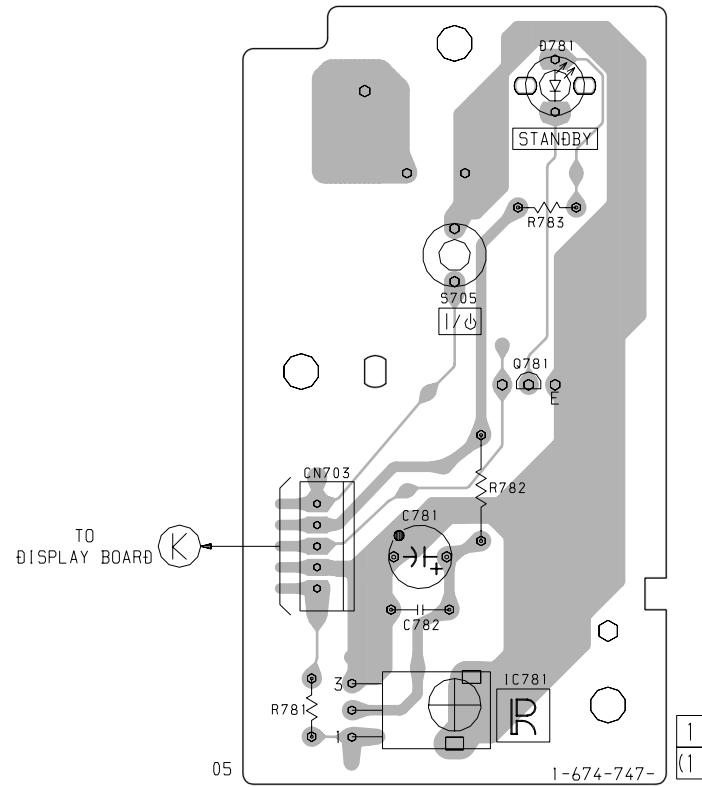


(Page 50)

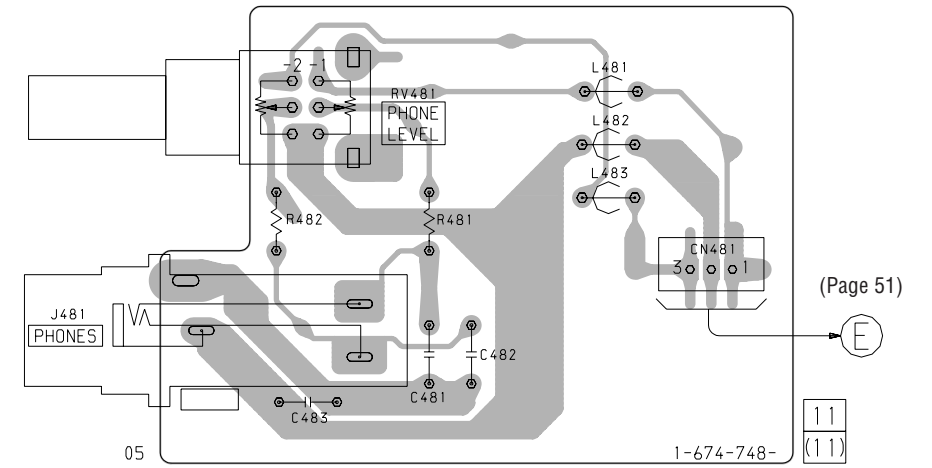
• Semiconductor Location

Ref. No.	Location
D751	A-7
D752	A-7
IC751	C-8
Q751	A-7
Q752	A-7
Q753	C-4
Q754	C-4

【PWSW BOARD】



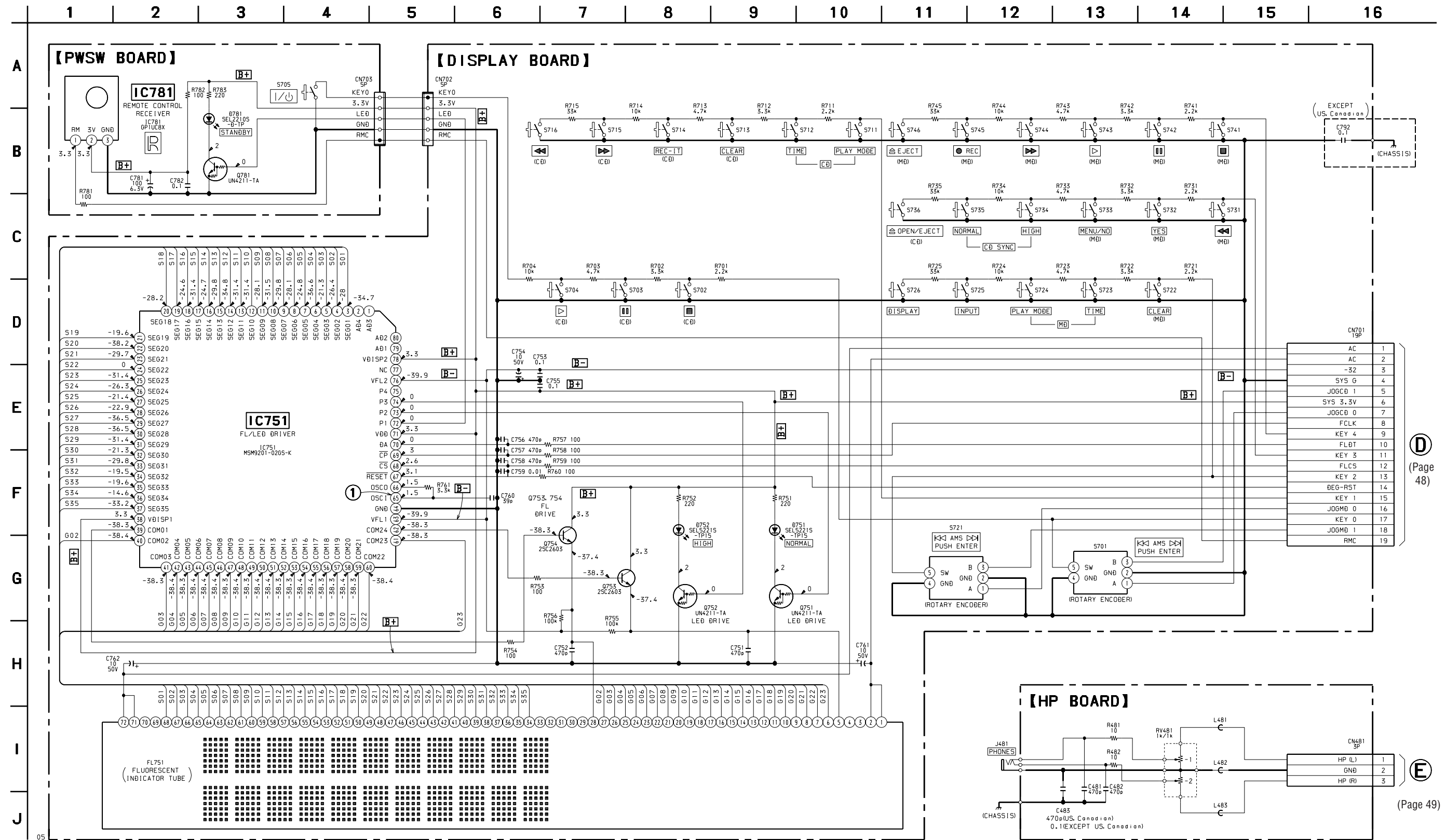
【HP BOARD】



(Page 51)



6-13. SCHEMATIC DIAGRAM – DISPLAY / PWSW / HP Boards – • See page 56 for Waveform.



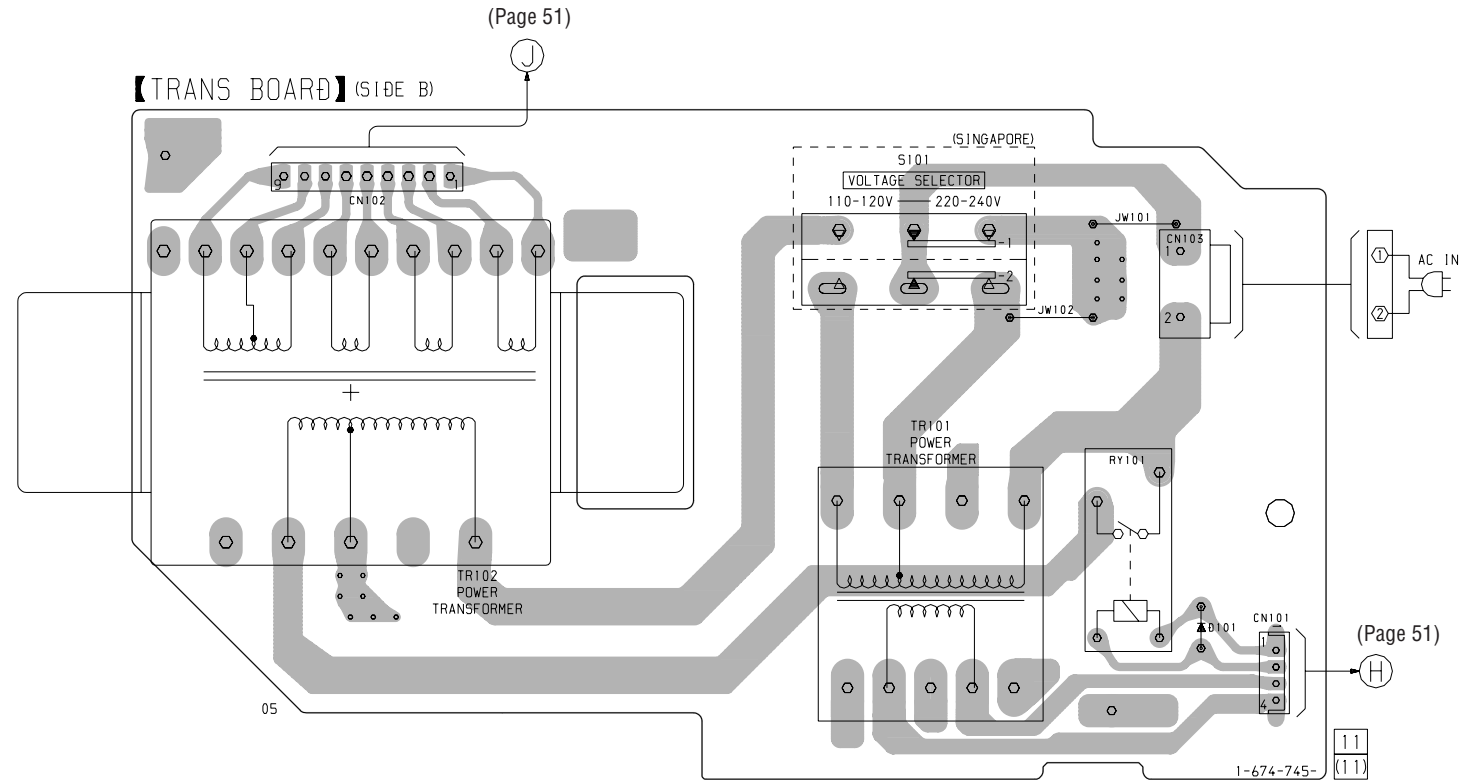
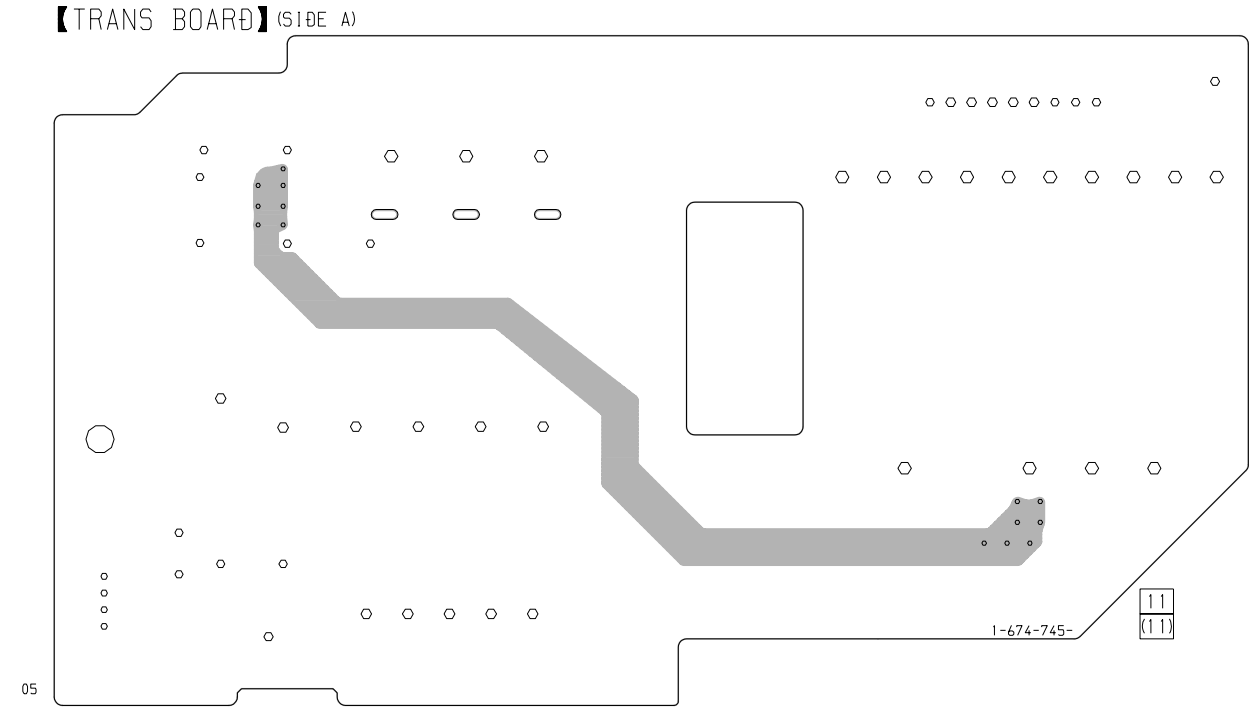
(Page 48)

(Page 49)

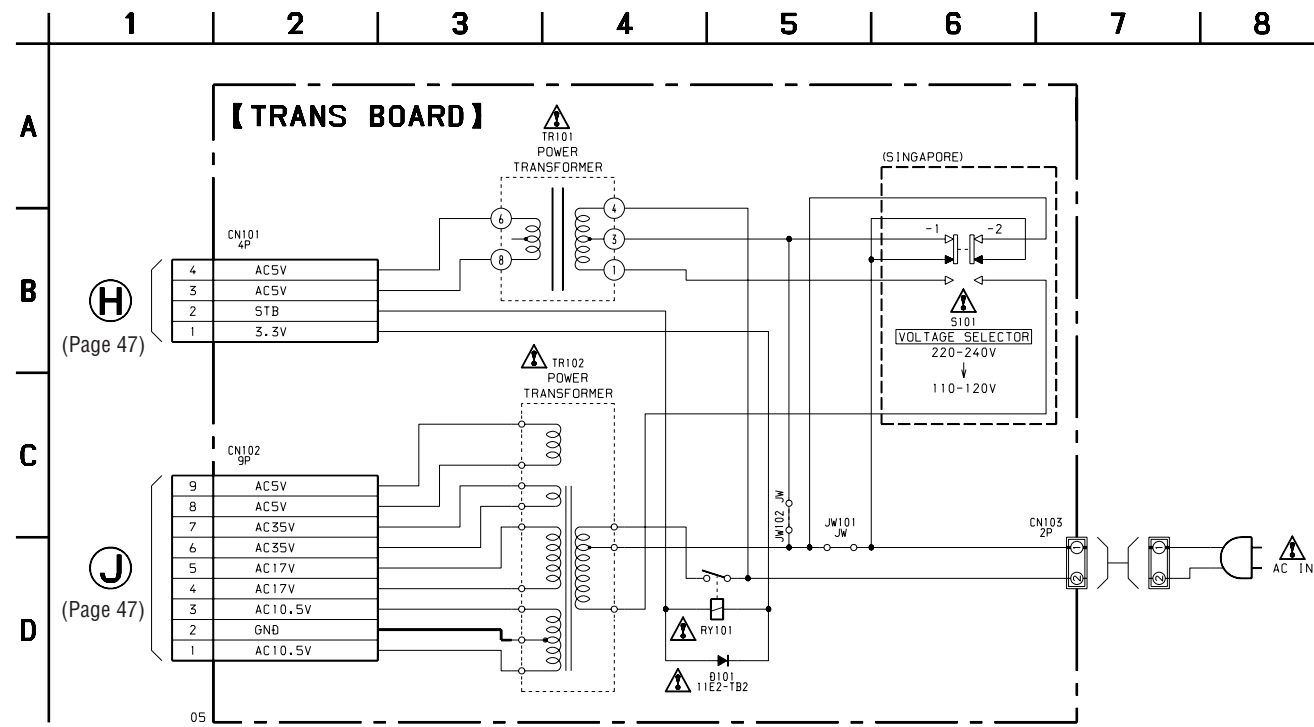
**Note on Schematic Diagram:**

- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : STOP

6-14. PRINTED WIRING BOARD – TRANS Board – • See page 41 for Circuit Boards Location.



6-15. SCHEMATIC DIAGRAM – TRANS Board –



**Note on Schematic Diagram:**

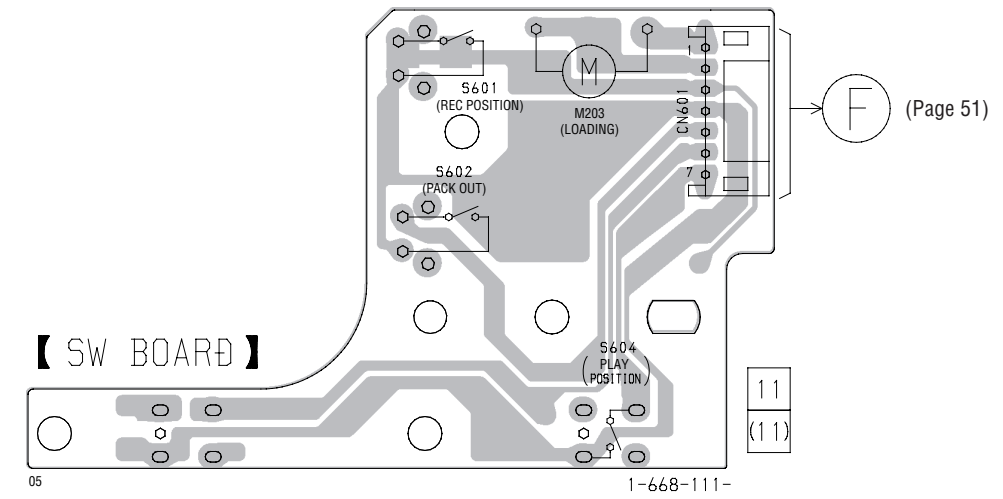
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : MD PLAY

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

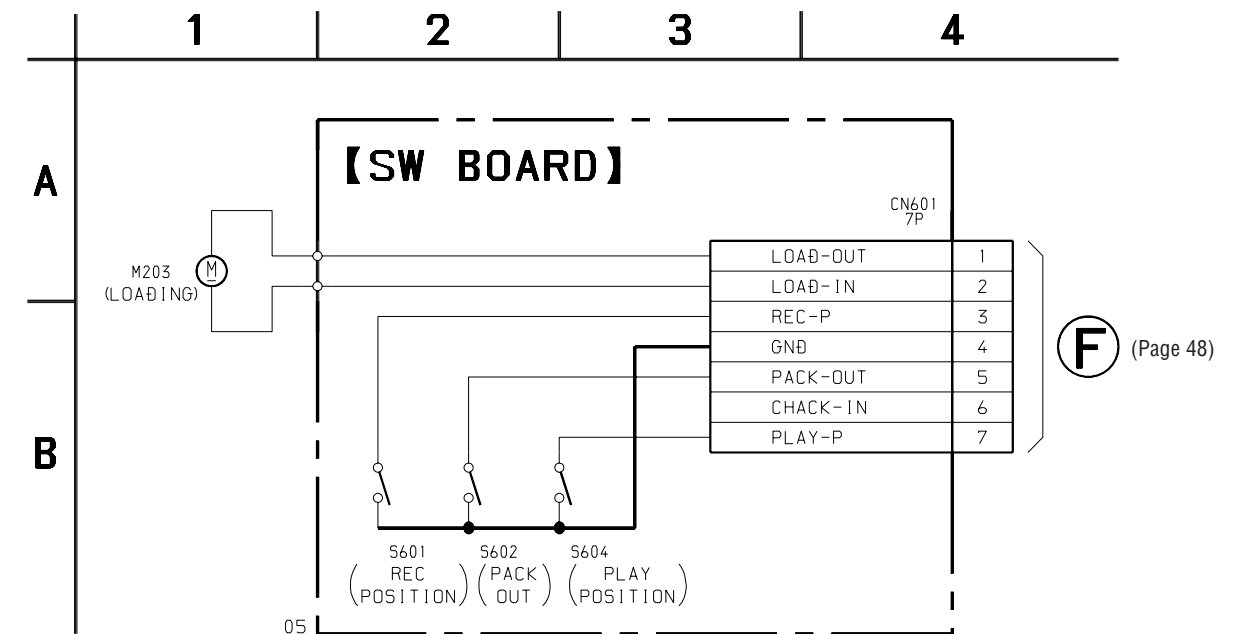
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

以阴影和  $\Delta$  标志来识别的零部件在安全方面具有关键性。因此只能以规定号码的零部件来更换。

6-16. PRINTED WIRING BOARD – SW Board – • See page 41 for Circuit Boards Location.

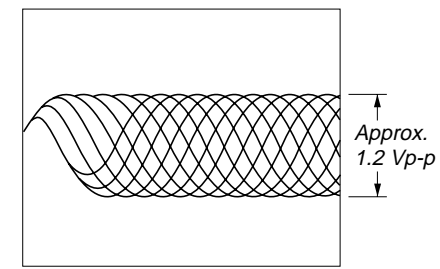


6-17. SCHEMATIC DIAGRAM – SW Board –

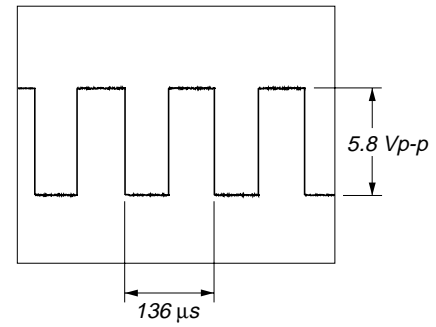


• Waveforms  
– BD (CD) Board –

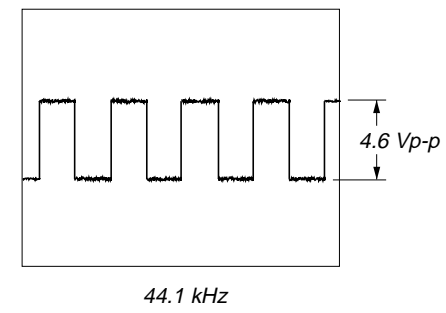
1 IC131 16 (RFO) (PLAY MODE)



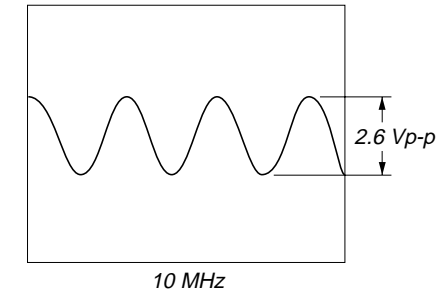
6 IC101 10 (WFCK)



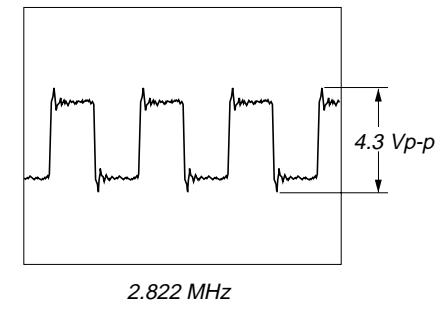
5 IC121 27 (LRCK)



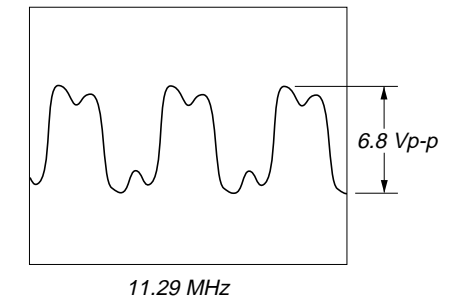
2 IC601 15 (XIN)



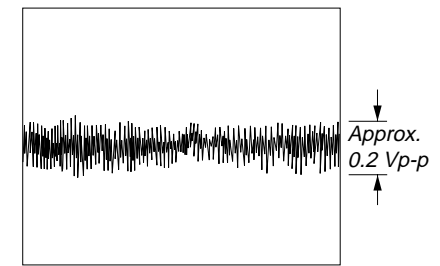
7 IC401 12 (BCLK)



12 IC603 8 (2-Q)

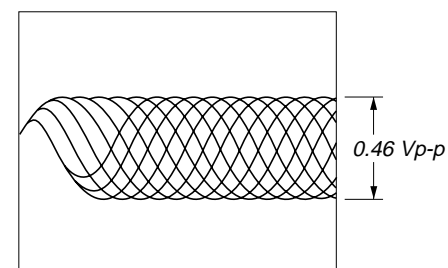


2 IC101 41 (TE) (PLAY MODE)

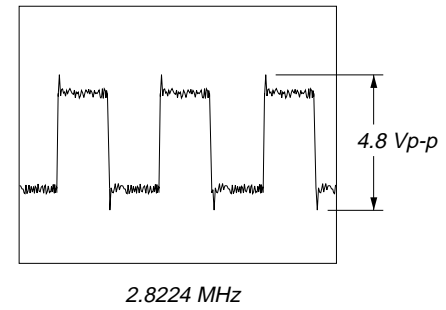


– BD (MD) Board –

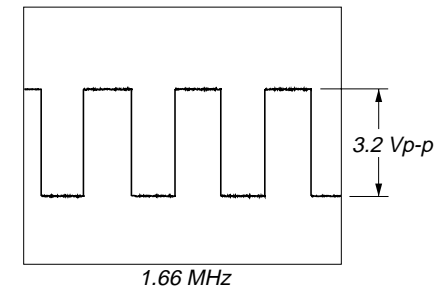
1 IC101 1, 2 (I, J) (MD PLAY)



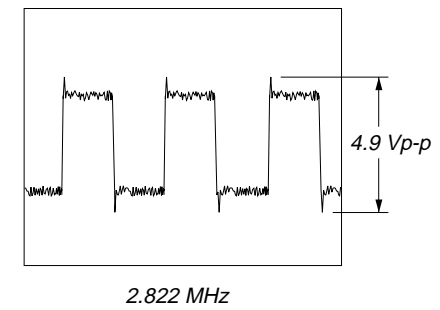
6 IC121 28 (XBCK)



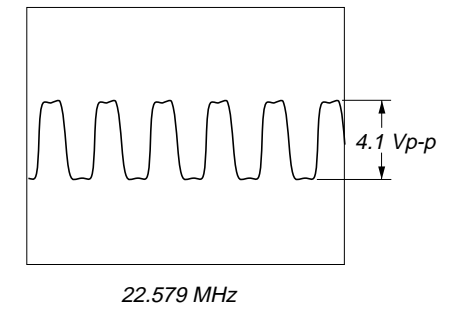
3 IC601 33 (SCLK)



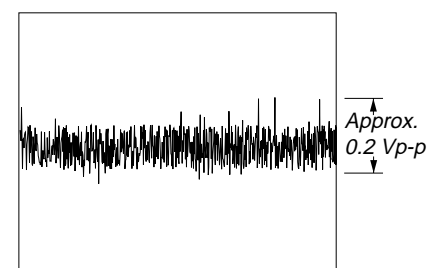
8 IC607 14 (4A)



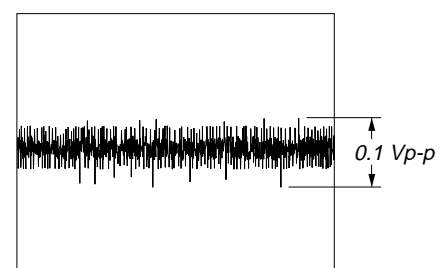
13 IC603 11 (2CK)



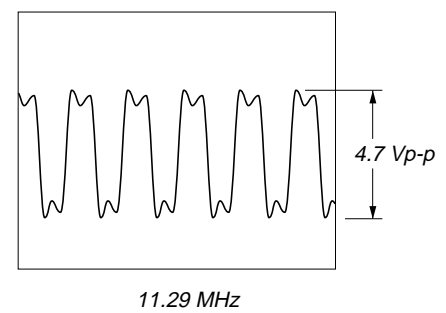
3 IC101 39 (FE) (PLAY MODE)



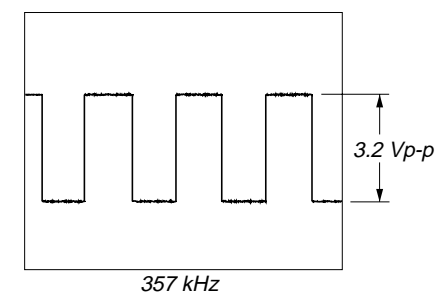
2 IC101 4 (A) (MD PLAY)



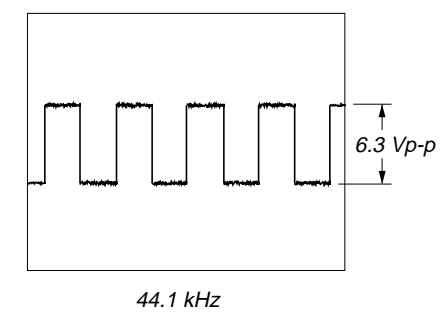
7 IC121 29 (FS256)



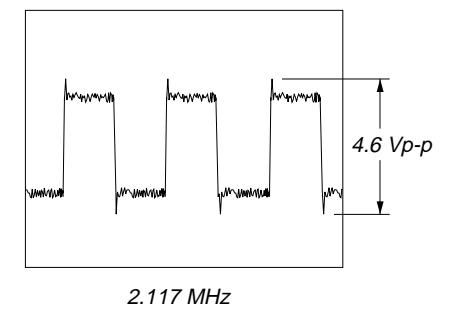
4 IC601 37 (FLCLK)



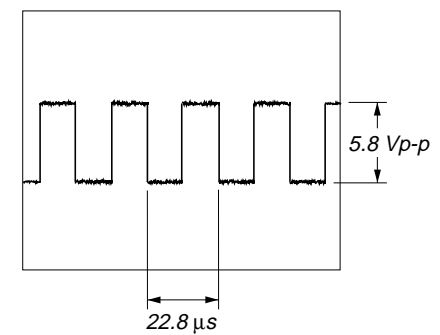
9 IC605 12



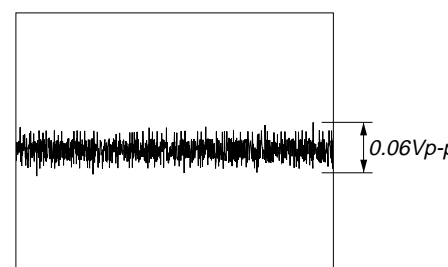
14 IC606 8



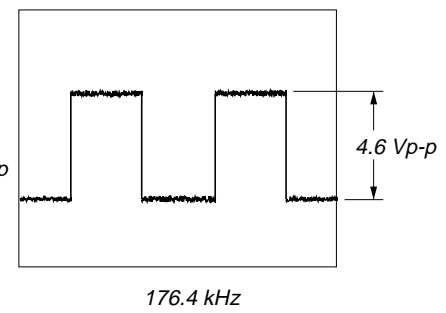
4 IC101 65 (LRCK)



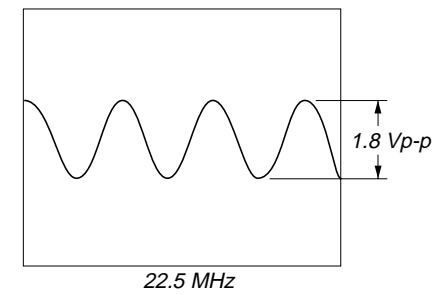
3 IC101 8, 9 (E, F) (MD PLAY)



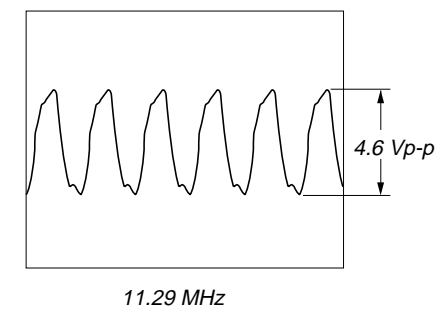
8 IC121 30 (FS4)



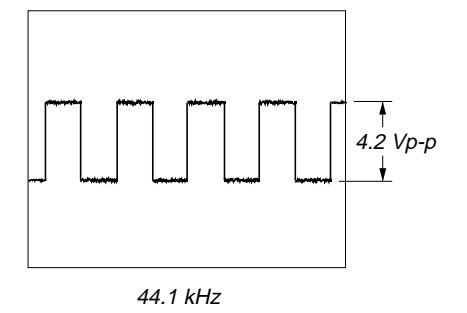
5 IC401 9 (XTI)



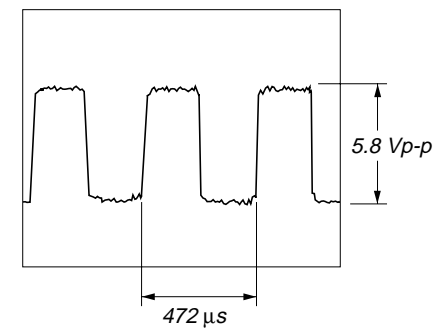
10 IC503 13



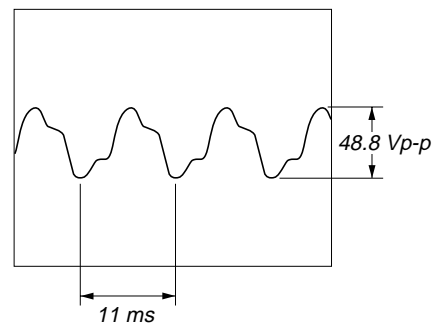
15 IC606 11



5 IC101 67 (BCLK)

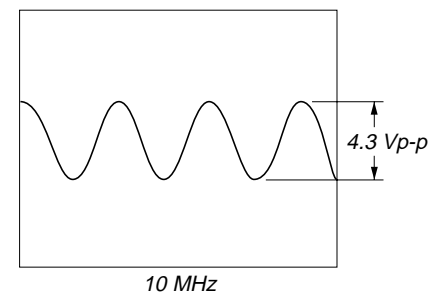


4 IC121 16 (OSCI)

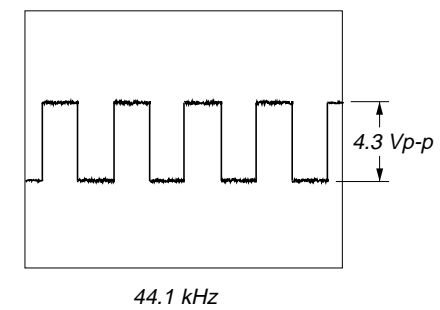


– MAIN Board –

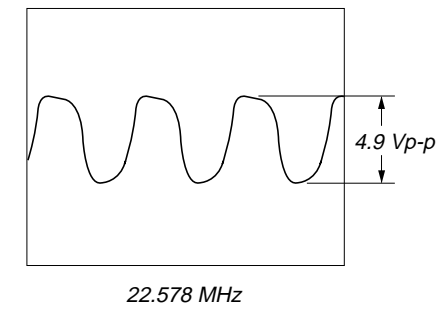
1 IC501 12 (XIN) (CD PLAY)



6 IC401 11 (LRCK)

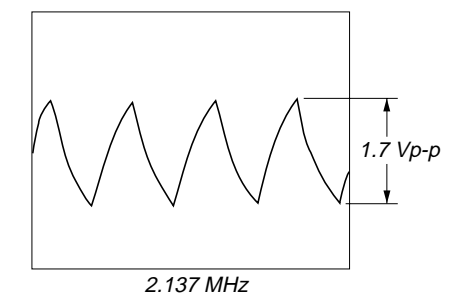


11 IC604 1



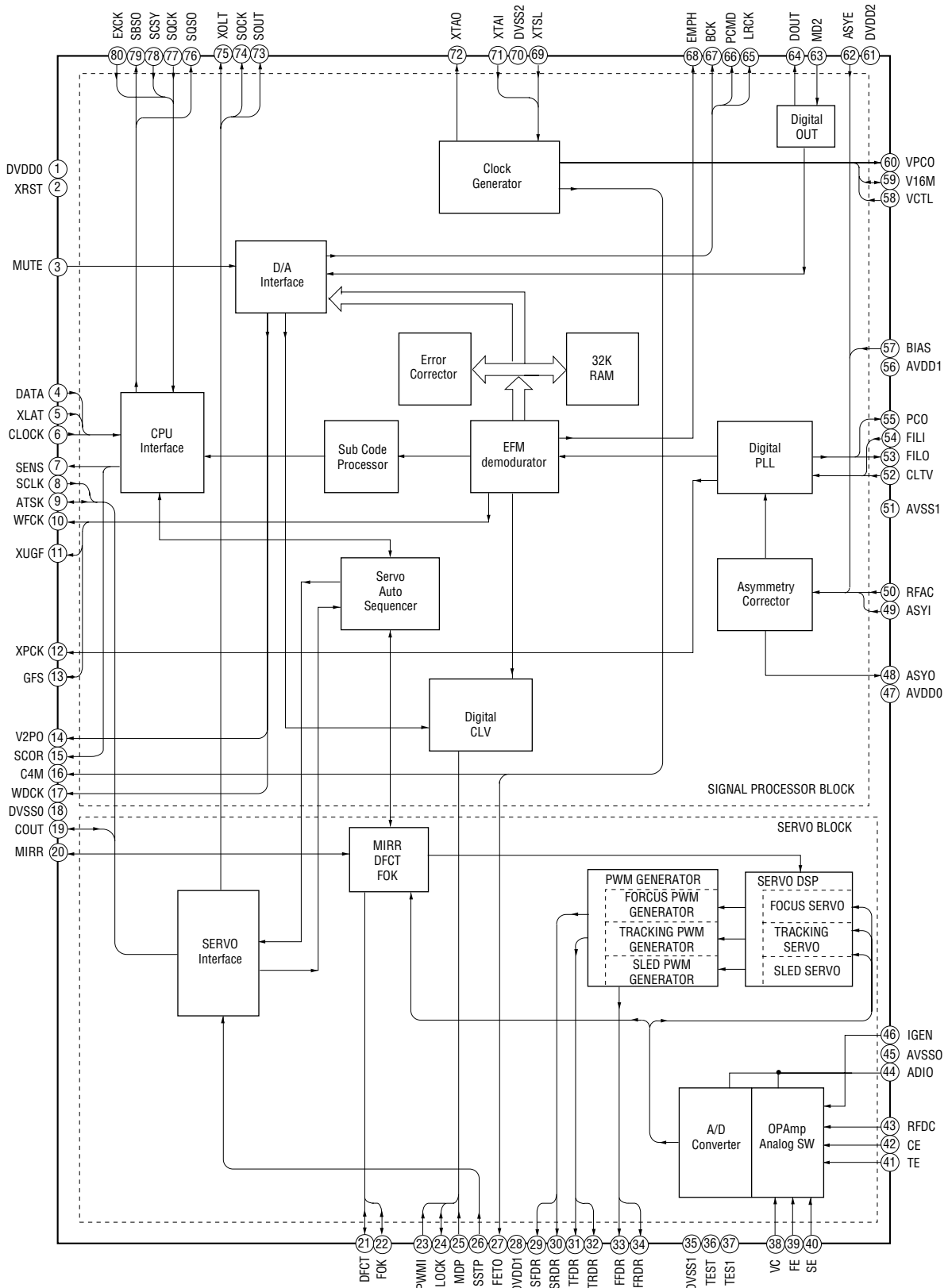
– DISPLAY Board –

1 IC751 65 (OSCI)

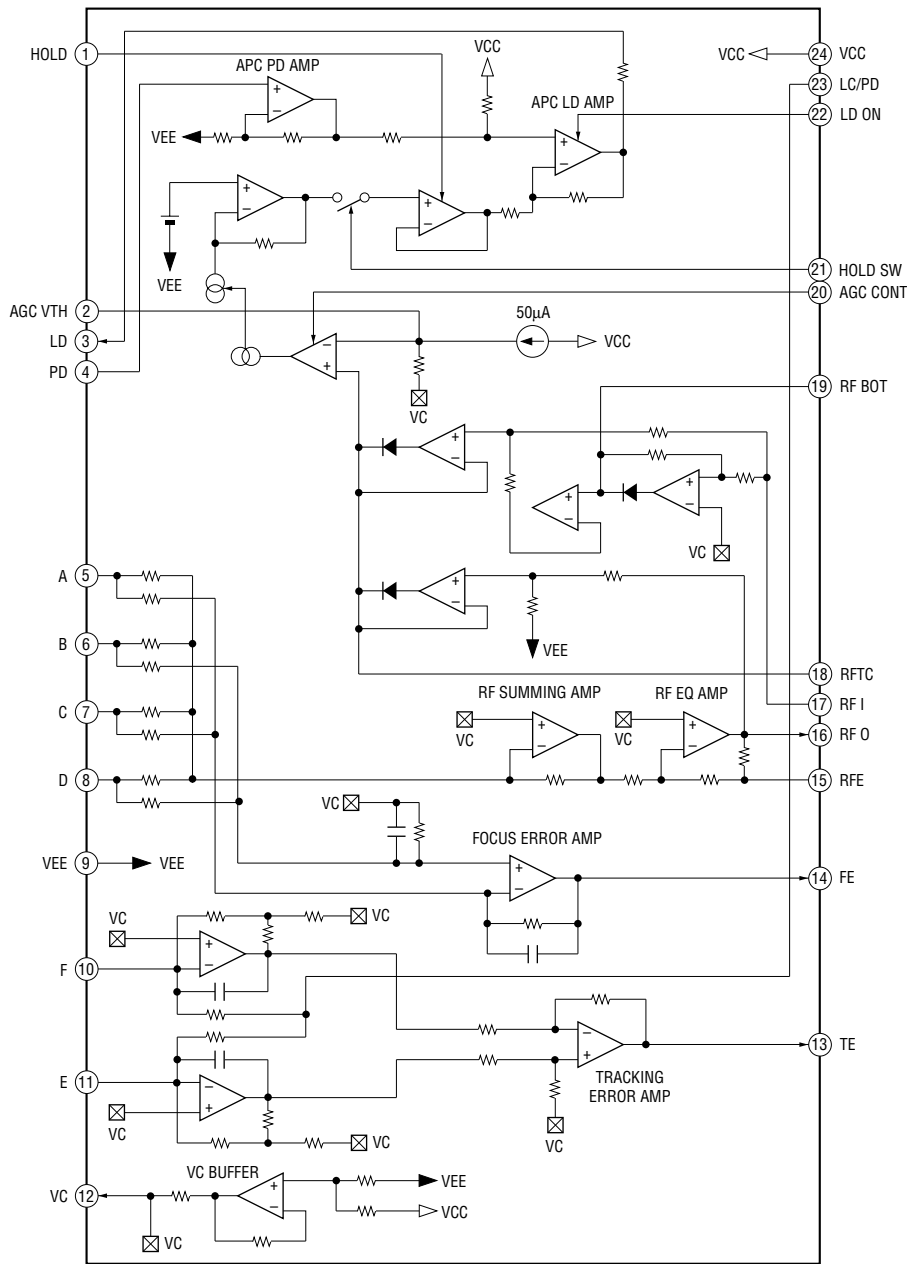




• IC Block Diagrams  
 – BD (CD) Board –  
 IC101 CXD2585Q

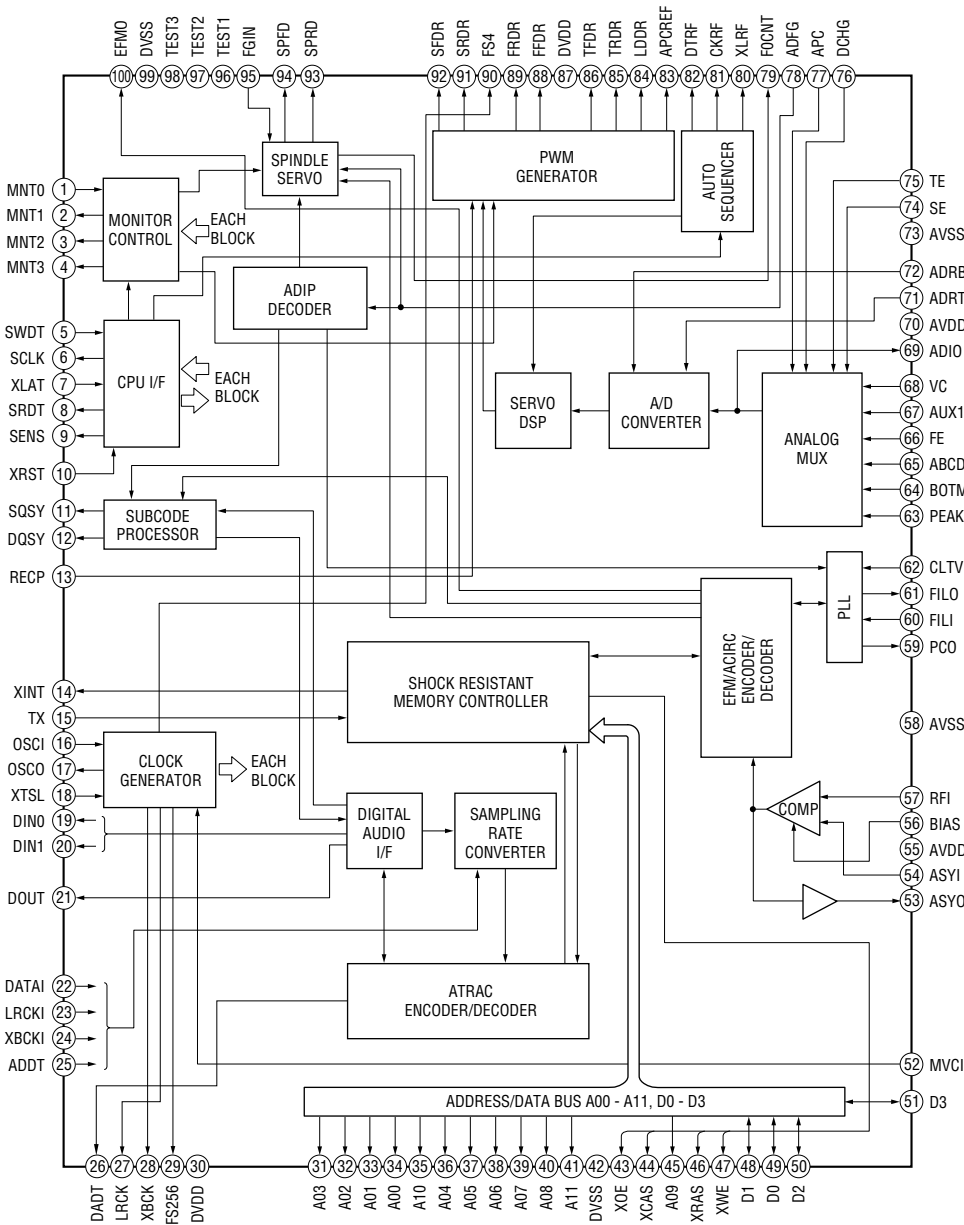


IC131 CXA2568M-T6

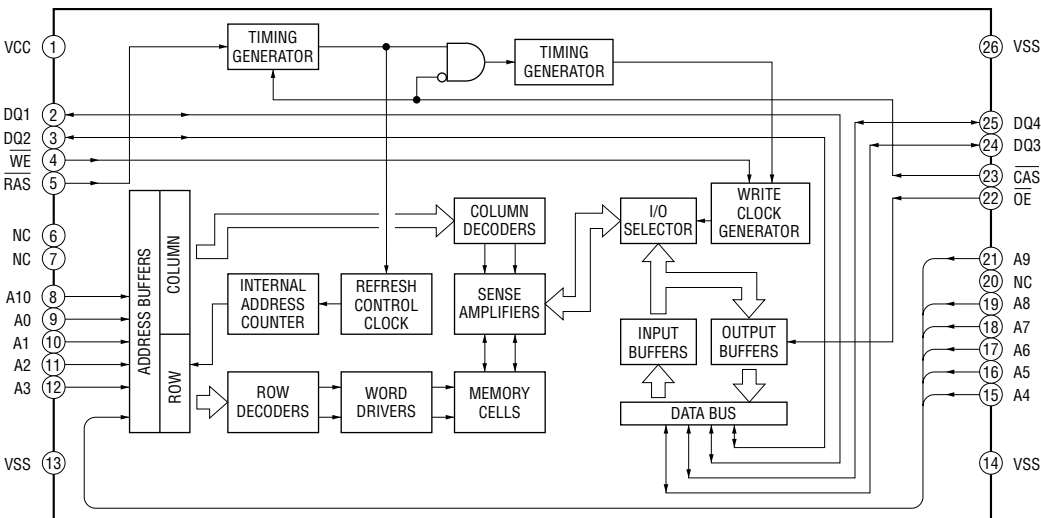




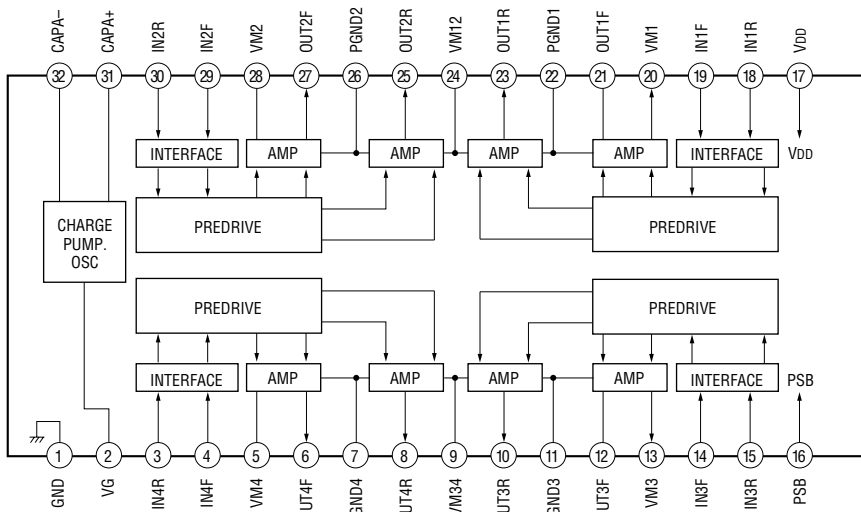
**IC121 CXD2656AR**



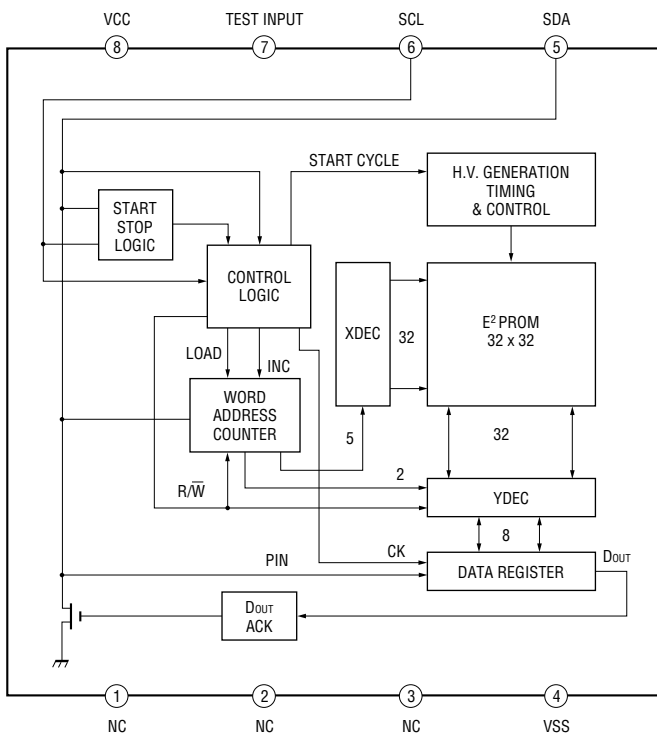
**IC124 MSM51V17400D-50TS-K**



**IC152 BH6511FS-E2**

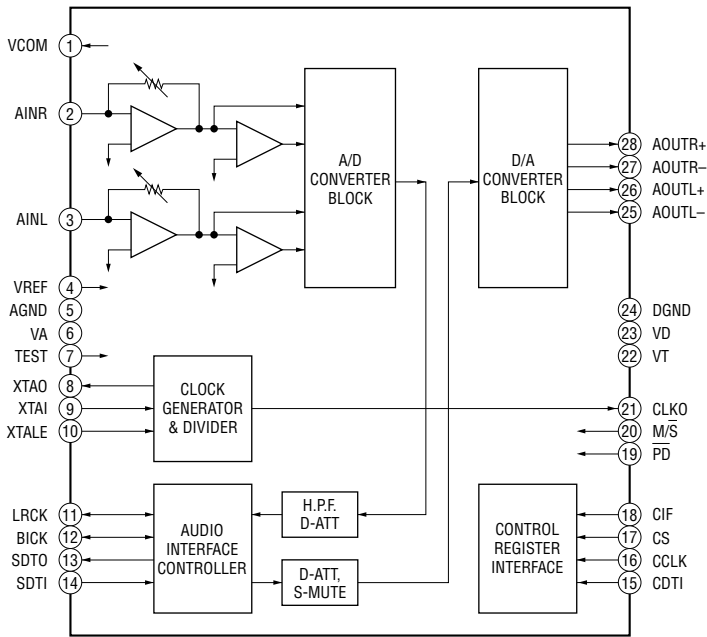


**IC171 BR24C02F-E2**

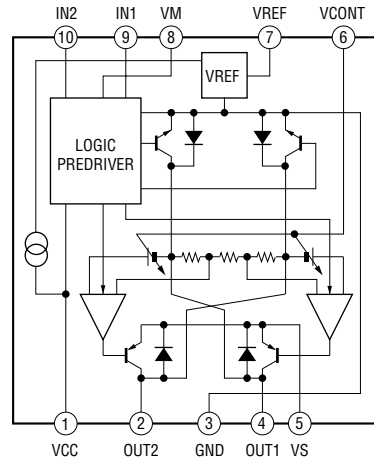


- MAIN Board -

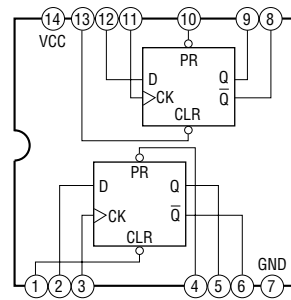
IC401 AK4524-TP



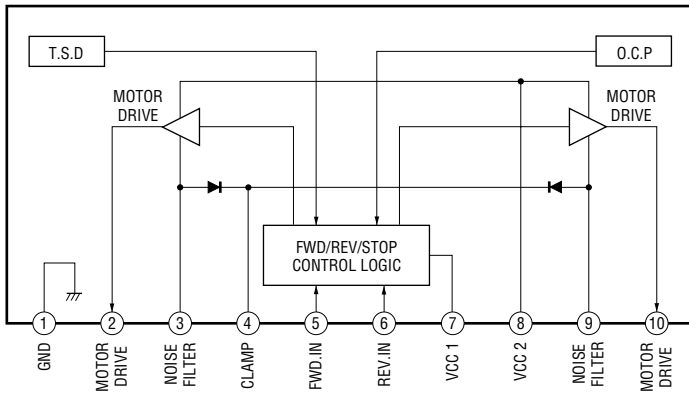
IC602 LB1830M-S-TE-L



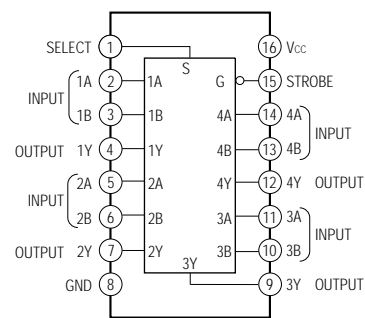
IC603 SN74HCT74ANSR



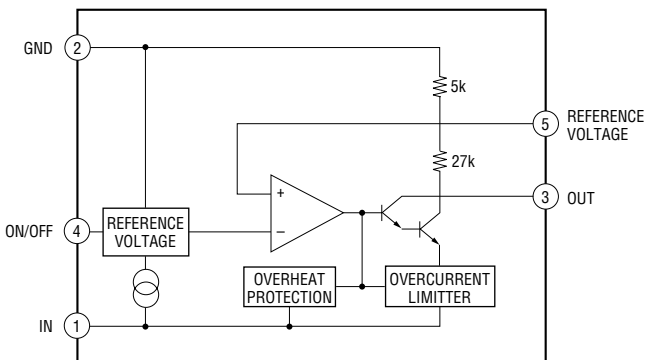
IC502 LB1641



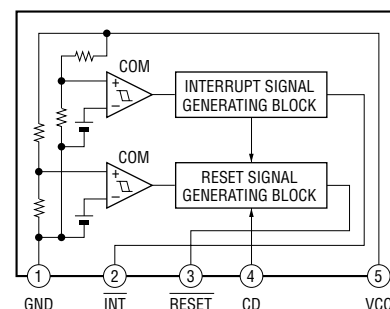
IC607 SN74HC157ANSR



IC941 M5293L



IC906 M62016L



## 6-18. IC PIN FUNCTION DESCRIPTION

### • BD (MD) BOARD IC101 CXA2523AR (RF AMP, FOCUS/TRACKING ERROR AMP)

Pin No.	Pin Name	I/O	Description
1	I	I	I-V converted RF signal I input from the optical pick-up block detector
2	J	I	I-V converted RF signal J input from the optical pick-up block detector
3	VC	O	Middle point voltage (+1.65V) generation output terminal
4 to 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input from the optical pick-up block laser diode
11	APC	O	Laser amplifier output terminal to the automatic power control circuit
12	APCREF	I	Reference voltage input terminal for setting laser power
13	GND	—	Ground terminal
14	TEMPI	I	Connected to the temperature sensor
15	TEMPR	O	Output terminal for a temperature sensor reference voltage
16	SWDT	I	Writing serial data input from the CXD2656AR (IC121)
17	SCLK	I	Serial data transfer clock signal input from the CXD2656AR (IC121)
18	XLAT	I	Serial data latch pulse signal input from the CXD2656AR (IC121)
19	XSTBY	I	Standby signal input terminal “L”: standby (fixed at “H” in this set)
20	F0CNT	I	Center frequency control voltage input terminal of internal circuit (BPF22, BPF3T, EQ) input from the CXD2656AR (IC121)
21	VREF	O	Reference voltage output terminal Not used (open)
22	EQADJ	I	Center frequency setting terminal for the internal circuit (EQ)
23	3TADJ	I	Center frequency setting terminal for the internal circuit (BPF3T)
24	VCC	—	Power supply terminal (+3.3V)
25	WBLADJ	I	Center frequency setting terminal for the internal circuit (BPF22)
26	TE	O	Tracking error signal output to the CXD2656AR (IC121)
27	CSLED	I	Connected to the external capacitor for low-pass filter of the sled error signal
28	SE	O	Sled error signal output to the CXD2656AR (IC121)
29	ADFM	O	FM signal output of the ADIP
30	ADIN	I	Receives a ADIP FM signal in AC coupling
31	ADAGC	I	Connected to the external capacitor for ADIP AGC
32	ADFG	O	ADIP duplex signal (22.05 kHz $\pm$ 1 kHz) output to the CXD2656AR (IC121)
33	AUX	O	Auxiliary signal (I <sub>3</sub> signal/temperature signal) output to the CXD2656AR (IC121)
34	FE	O	Focus error signal output to the CXD2656AR (IC121)
35	ABCD	O	Light amount signal (ABCD) output to the CXD2656AR (IC121)
36	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2656AR (IC121)
37	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2656AR (IC121)
38	RF	O	Playback EFM RF signal output to the CXD2656AR (IC121)
39	RFAGC	I	Connected to the external capacitor for RF auto gain control circuit
40	AGCI	I	Receives a RF signal in AC coupling
41	COMPO	O	User comparator output terminal Not used (open)
42	COMPP	I	User comparator input terminal Not used (fixed at “L”)
43	ADDC	I	Connected to the external capacitor for cutting the low band of the ADIP amplifier
44	OPO	O	User operational amplifier output terminal Not used (open)
45	OPN	I	User operational amplifier inversion input terminal Not used (fixed at “L”)
46	RFO	O	RF signal output terminal
47	MORFI	I	Receives a MO RF signal in AC coupling
48	MORFO	O	MO RF signal output terminal

• **BD (MD) BOARD IC121 CXD2656AR**

**(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO PROCESSOR, EFM/ACIRC ENCODER/DECODER, SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER)**

Pin No.	Pin Name	I/O	Description
1	MNT0 (FOK)	O	Focus OK signal output to the system controller (IC601) “H” is output when focus is on (“L”: NG)
2	MNT1 (SHOCK)	O	Track jump detection signal output to the system controller (IC601)
3	MNT2 (XBUSY)	O	Busy monitor signal output to the system controller (IC601)
4	MNT3 (SLOCK)	O	Spindle servo lock status monitor signal output to the system controller (IC601)
5	SWDT	I	Writing serial data signal input from the system controller (IC601)
6	SCLK	I (S)	Serial data transfer clock signal input from the system controller (IC601)
7	XLAT	I (S)	Serial data latch pulse signal input from the system controller (IC601)
8	SRDT	O (3)	Reading serial data signal output to the system controller (IC601)
9	SENS	O (3)	Internal status (SENSE) output to the system controller (IC601)
10	XRST	I (S)	Reset signal input from the system controller (IC601) “L”: reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system controller (IC601) “L” is output every 13.3 msec Almost all, “H” is output
12	DQSY	O	Digital In U-bit CD format subcode Q sync (SCOR) output to the system controller (IC601) “L” is output every 13.3 msec Almost all, “H” is output
13	RECP	I	Laser power selection signal input from the system controller (IC601) “L”: playback mode, “H”: recording mode
14	XINT	O	Interrupt status output to the system controller (IC601)
15	TX	I	Recording data output enable signal input from the system controller (IC601) Writing data transmission timing input (Also serves as the magnetic head on/off output)
16	OSCI	I	System clock signal (90.3168 MHz) input terminal
17	OSCO	O	System clock signal (512Fs=90.3168 MHz) output terminal Not used (open)
18	XTSL	I	Input terminal for the system clock frequency setting “L”: 45.1584 MHz, “H”: 90.3168 MHz (fixed at “H” in this set)
19	DIN0	I	Digital audio signal input terminal when recording mode (for digital optical input)
20	DIN1	I	Digital audio signal input terminal when recording mode Not used (fixed at “L”)
21	DOUT	O	Digital audio signal output terminal when playback mode Not used (open)
22	DATAI	I	Serial data input from the system controller (IC601)
23	LRCKI	I	L/R sampling clock signal (44.1 kHz) input from the system controller (IC601)
24	XBCKI	I	Bit clock signal (2.8224 MHz) input from the system controller (IC601)
25	ADDT	I	Recording data input from the A/D, D/A converter (IC401)
26	DADT	O	Playback data output to the A/D, D/A converter (IC401)
27	LRCK	O	L/R sampling clock signal (44.1 kHz) output to the A/D, D/A converter (IC401)
28	XBCK	O	Bit clock signal (2.8224 MHz) output to the A/D, D/A converter (IC401)
29	FS256	O	Clock signal (11.2896 MHz) output to the A/D, D/A converter (IC401)
30	DVDD	—	Power supply terminal (+3.3V) (digital system)
31 to 34	A03 to A00	O	Address signal output to the D-RAM (IC124)
35	A10	O	Address signal output to the D-RAM (IC124)
36 to 40	A04 to A08	O	Address signal output to the D-RAM (IC124)
41	A11	O	Address signal output to the external D-RAM Not used (open)
42	DVSS	—	Ground terminal (digital system)
43	XOE	O	Output enable signal output to the D-RAM (IC124) “L” active

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



Pin No.	Pin Name	I/O	Description
44	<u>XCAS</u>	O	Column address strobe signal output to the D-RAM (IC124) "L" active
45	<u>A09</u>	O	Address signal output to the D-RAM (IC124)
46	<u>XRAS</u>	O	Row address strobe signal output to the D-RAM (IC124) "L" active
47	<u>XWE</u>	O	Write enable signal output to the D-RAM (IC124) "L" active
48	D1	I/O	Two-way data bus with the D-RAM (IC124)
49	D0	I/O	
50	D2	I/O	
51	D3	I/O	
52	MVCI	I (S)	Digital in PLL oscillation input from the external VCO Not used (fixed at "L")
53	ASYO	O	Playback EFM full-swing output terminal
54	ASYI	I (A)	Playback EFM asymmetry comparator voltage input terminal
55	AVDD	—	Power supply terminal (+3.3V) (analog system)
56	BIAS	I (A)	Playback EFM asymmetry circuit constant current input terminal
57	RFI	I (A)	Playback EFM RF signal input from the CXA2523AR (IC101)
58	AVSS	—	Ground terminal (analog system)
59	PCO	O (3)	Phase comparison output for master clock of the recording/playback EFM master PLL
60	FILI	I (A)	Filter input for master clock of the recording/playback master PLL
61	FILO	O (A)	Filter output for master clock of the recording/playback master PLL
62	CLTV	I (A)	Internal VCO control voltage input of the recording/playback master PLL
63	PEAK	I (A)	Light amount signal (RF/ABCD) peak hold input from the CXA2523AR (IC101)
64	BOTM	I (A)	Light amount signal (RF/ABCD) bottom hold input from the CXA2523AR (IC101)
65	ABCD	I (A)	Light amount signal (ABCD) input from the CXA2523AR (IC101)
66	FE	I (A)	Focus error signal input from the CXA2523AR (IC101)
67	AUX1	I (A)	Auxiliary signal (I <sub>3</sub> signal/temperature signal) input from the CXA2523AR (IC101)
68	VC	I (A)	Middle point voltage (+1.65V) input from the CXA2523AR (IC101)
69	ADIO	O (A)	Monitor output of the A/D converter input signal Not used (open)
70	AVDD	—	Power supply terminal (+3.3V) (analog system)
71	ADRT	I (A)	A/D converter operational range upper limit voltage input terminal (fixed at "H" in this set)
72	ADRB	I (A)	A/D converter operational range lower limit voltage input terminal (fixed at "L" in this set)
73	AVSS	—	Ground terminal (analog system)
74	SE	I (A)	Sled error signal input from the CXA2523AR (IC101)
75	TE	I (A)	Tracking error signal input from the CXA2523AR (IC101)
76	DCHG	I (A)	Connected to the +3.3V power supply
77	APC	I (A)	Error signal input for the laser automatic power control Not used (fixed at "H")
78	ADFG	I (S)	ADIP duplex FM signal (22.05 kHz ± 1 kHz) input from the CXA2523AR (IC101)
79	FOCNT	O	Filter f0 control signal output to the CXA2523AR (IC101)
80	XLRF	O	Serial data latch pulse signal output to the CXA2523AR (IC101)
81	CKRF	O	Serial data transfer clock signal output to the CXA2523AR (IC101)
82	DTRF	O	Writing serial data output to the CXA2523AR (IC101)
83	APCREF	O	Control signal output to the reference voltage generator circuit for the laser automatic power control
84	LDDR	O	PWM signal output for the laser automatic power control Not used (open)
85	TRDR	O	Tracking servo drive PWM signal (-) output to the BH6511FS (IC152)
86	TFDR	O	Tracking servo drive PWM signal (+) output to the BH6511FS (IC152)
87	DVDD	—	Power supply terminal (+3.3V) (digital system)
88	FFDR	O	Focus servo drive PWM signal (+) output to the BH6511FS (IC152)

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

Pin No.	Pin Name	I/O	Description
89	FRDR	O	Focus servo drive PWM signal (-) output to the BH6511FS (IC152)
90	FS4	O	Clock signal (176.4 kHz) output terminal (X'tal system) Not used (open)
91	SRDR	O	Sled servo drive PWM signal (-) output to the BH6511FS (IC152)
92	SFDR	O	Sled servo drive PWM signal (+) output to the BH6511FS (IC152)
93	SPRD	O	Spindle servo drive PWM signal (-) output to the BH6511FS (IC152)
94	SPFD	O	Spindle servo drive PWM signal (+) output to the BH6511FS (IC152)
95	FGIN	I (S)	Input terminal for the test (fixed at "L")
96	TEST1	I	
97	TEST2	I	
98	TEST3	I	
99	DVSS	—	Ground terminal (digital system)
100	EFMO	O	EFM signal output terminal when recording mode

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

• MAIN BOARD IC501 M30625MGA-A50GP (CD MECHANISM CONTROL)

Pin No.	Pin Name	I/O	Description
1	NC	O	Not used (open)
2	LEVEL R	O	R-ch level output to the system controller (IC601)
3	LEVEL L	O	L-ch level output to the system controller (IC601)
4, 5	NC	O	Not used (open)
6	CNVSS	—	Ground terminal
7, 8	NC	O	Not used (open)
9	$\overline{\text{RESET}}$	I	System reset signal input from the reset signal generator (IC906) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
10	XOUT	O	Main system clock output terminal (10 MHz)
11	VSS	—	Ground terminal
12	XIN	I	Main system clock input terminal (10 MHz)
13	VCC	—	Power supply terminal (+5V)
14	NMI	I	Non-maskable interrupt input terminal Fixed at “H” in this set
15	NC	O	Not used (open)
16	SCOR	I	Subcode sync (S0+S1) detection signal input from the CXD2585Q (IC101) on the CD block “H”: active
17	LPH	O	Laser power control signal output to the CXD2585Q (IC101) on the CD block “H” active
18	XSEL	O	Operation mode select signal output to the CXD2585Q (IC101) on the CD block “H” active
19	AMUTE	O	Analog muting on/off control signal output to the CXD2585Q (IC101) on the CD block “H”: muting on
20, 21	NC	O	Not used (open)
22	I2CCLK	I/O	Communication data reading clock signal input or transfer clock signal output with the system controller (IC601)
23	I2CDATA	I/O	Communication data bus with the system controller (IC601)
24	TXD1	O	Not used (open)
25	RXD1	O	Not used (open)
26	CLK1	O	Not used (open)
27	RTS1	O	Not used (open)
28	NC	O	Not used (open)
29	SUBQ	I	Subcode Q data input from the CXD2585Q (IC101) on the CD block
30	$\overline{\text{SQCLK}}$	O	Subcode Q data reading clock signal output to the CXD2585Q (IC101) on the CD block “L”: active
31 to 33	NC	O	Not used (open)
34	SPDL MUTE	O	Spindle motor muting control signal output to the spindle motor drive (IC191) on the CD block
35	DATA	O	Serial data output to the CXD2585Q (IC101) on the CD block
36	$\overline{\text{CLK}}$	O	Serial data transfer clock signal output to the CXD2585Q (IC101) on the CD block “L” active
37	XLT	O	Serial data latch pulse output to the CXD2585Q (IC101) on the CD block “L” active
38	SENSE	I	Internal status detection monitor input from the CXD2585Q (IC101) on the CD block
39	LDON	O	Laser on/off control signal output to the CXA2568M (IC131) “H”: laser on
40	1/4 SW	O	Disc speed selection signal output to the BU4053BCFV (IC182) on the CD block
41	8/12 SW	O	Disc size selection signal output to the BU4053BCFV (IC182) on the CD block
42	BDSW1	O	BD selection signal output Not used (open)
43	BDSW2	O	BD selection signal output Not used (open)

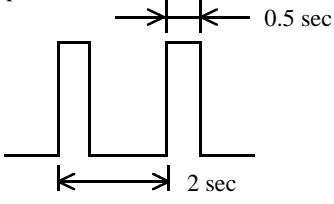
Pin No.	Pin Name	I/O	Description
44	AFADJ	I	Input terminal for the CD test mode setting "L": AFADJ mode
45	ADJ	I	Input terminal for the CD test mode setting "L": ADJ mode
46, 47	NC	O	Not used (open)
48	LODOUT	O	Motor drive signal output to the loading motor drive (IC502) "H" active *1
49	LODIN	O	Motor drive signal output to the loading motor drive (IC502) "H" active *1
50	INSW	I	Loading in detect switch (S152) input terminal
51	OUTSW	I	Loading out detect switch (S151) input terminal
52 to 74	NC	O	Not used (open)
75	AVSS	—	Ground terminal (for A/D conversion)
76	NC	O	Not used (open)
77	VREF	I	Reference voltage (+5V) input terminal
78	AVCC	—	Power supply terminal (+5V) (for A/D conversion)
79, 80	NC	O	Not used (open)

\*1 Loading motor (M103) control

Terminal	Mode	IN	OUT	BRAKE	RUN IDLE
	LODOUT (pin 48)		"L"	"H"	"H"
LODIN (pin 49)		"H"	"L"	"H"	"L"

• MAIN BOARD IC601 M30624MG-A10FP (SYSTEM CONTROLLER (MD MECHANISM CONTROLLER))

Pin No.	Pin Name	I/O	Description
1	DACDTI	O	Serial data output to the A/D, D/A converter (IC401)
2	DACCLK	O	Serial data transfer clock signal output to the A/D, D/A converter (IC401)
3	DALATCH	O	Serial data latch pulse signal output to the A/D, D/A converter (IC401)
4	$\overline{\text{DARESET}}$	O	Reset signal output to the A/D, D/A converter (IC401) “L”: reset
5	XAMUTE	O	Audio line muting on/off control signal output terminal “L”: line muting on
6	SIRCS	I	Remote control signal input from the remote control receiver (IC781)
7	NC	O	Not used (open)
8	BYTE	I	External data bus line byte selection signal input “L”: 16 bit, “H”: 8 bit (fixed at “L”)
9	CNVSS	—	Ground terminal
10	XCIN	I	Sub system clock input terminal (32.768 kHz) Not used (pull down)
11	XCOUT	O	Sub system clock output terminal (32.768 kHz) Not used (open)
12	$\overline{\text{S.RST}}$	I	System reset signal input from the M62016L (IC906) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
13	XOUT	O	Main system clock output terminal (10 MHz)
14	GND	—	Ground terminal
15	XIN	I	Main system clock input terminal (10 MHz)
16	VCC	—	Power supply terminal (+3.3V)
17	$\overline{\text{NMI}}$	I	Non-maskable interrupt input terminal “L” active (fixed at “H” in this set)
18	DQSY	I	Digital In U-bit CD format subcode Q sync (SCOR) input from the CXD2656AR (IC121) “L” is input every 13.3 msec Almost all, “H” is input
19	$\overline{\text{P.DOWN}}$	I	Power down detection signal input terminal “L”: power down, normally: “H”
20	SOFT RST	I	Software reset signal input terminal Not used (pull up)
21	JOGCD0	I	Jog dial pulse input from the rotary encoder (S701 $\llcorner\llcorner$ AMS $\gg\gg$ ) A phase input
22	JOGCD1	I	Jog dial pulse input from the rotary encoder (S701 $\llcorner\llcorner$ AMS $\gg\gg$ ) B phase input
23	JOGMD0	I	Jog dial pulse input from the rotary encoder (S721 $\llcorner\llcorner$ AMS $\gg\gg$ ) A phase input
24	JOGMD1	I	Jog dial pulse input from the rotary encoder (S721 $\llcorner\llcorner$ AMS $\gg\gg$ ) B phase input
25, 26	NC	O	Not used (open)
27	SQSY	I	Subcode Q sync (SCOR) input from the CXD2656AR (IC121) “L” is input every 13.3 msec Almost all, “H” is input
28	I2CBUSY	I/O	Not used (open)
29	I2CCLK	I/O	Communication data reading clock signal output or transfer clock signal input with the CD mechanism controller (IC501)
30	I2CDATA	I/O	Communication data bus with the CD mechanism controller (IC501)
31	SWDT	O	Writing data output to the CXD2656AR (IC121)
32	SRDT	I	Reading data input from the CXD2656AR (IC121)
33	SCLK	O	Serial clock signal output to the CXD2656AR (IC121)
34	FLCS	O	Chip select signal output to the FL/LED driver (IC751)
35	FLDATA	O	Serial data output to the FL/LED driver (IC751)
36	NC	O	Not used (open)
37	FLCLK	O	Serial data transfer clock signal output to the FL/LED driver (IC751)
38 to 43	NC	O	Not used (open)
44	LINE SEL2	O	Audio line selection output terminal
45	LINE SEL1	O	Audio line selection output terminal
46	LINE SEL0	O	Audio line selection output terminal
47, 48	NC	O	Not used (open)
49	STB	O	Strobe signal output to the power supply circuit “L”: standby mode, “H”: power on

Pin No.	Pin Name	I/O	Description
50	<u>CDRST</u>	O	Reset signal output to the CD mechanism controller (IC501)
51, 52	NC	O	Not used (open)
53	PACKOUT	I	Detection input from the loading-out detect switch (S602) “L” at a load-out position, others: “H”
54	LDIN	O	Motor control signal output to the loading motor driver (IC602) “L” active *1
55	LDOUT	O	Motor control signal output to the loading motor driver (IC602) “L” active *1
56	LDLOW	O	Loading motor drive voltage control signal output for the loading motor driver (IC602) “H” active
57, 58	NC	O	Not used (open)
59	RECP	I	Detection input from the recording position detect switch (S601) “L” active
60	PBP	I	Detection input from the playback position detect switch (S604) “L” active
61	XLATCH	O	Serial data latch pulse signal output to the CXD2656AR (IC121)
62	<u>VCC</u>	—	Power supply terminal (+3.3V)
63	<u>XDRST</u>	O	Reset signal output to the CXD2656AR (IC121) and BH6511FS (IC152) “L”: reset
64	VSS	—	Ground terminal
65	SDA	I/O	Two-way data bus with the EEPROM (IC171)
66	MNT3 (SLOCK)	I	Spindle servo lock status monitor signal input from the CXD2656AR (IC121)
67	WPOWER	O	Laser power select signal output to the CXD2656AR (IC121) and HF module switch circuit “L”: playback mode, “H”: recording mode
68	PROTECT	I	Rec-proof claw detect input from the protect detect switch (S102) “H”: write protect
69	REFLECT	I	Detection input from the disc reflection rate detect switch (S102) “L”: high reflection rate disc, “H”: low reflection rate disc
70	LDON	O	Laser diode on/off control signal output to the automatic power control circuit “H”: laser on
71	SENS	I	Internal status (SENSE) input from the CXD2656AR (IC121)
72	MNT1 (SHOCK)	I	Track jump detection signal input from the CXD2656AR (IC121)
73	NC	O	Not used (open)
74	XINT	I	Interrupt status input from the CXD2656AR (IC121)
75	NC	O	Not used (open)
76	MOD	O	Laser modulation select signal output to the HF module switch circuit Stop: “L”, Playback power: “H”, Recording power: 
77	LIMITIN	I	Detection input from the sled limit-in detect switch (S101) The optical pick-up is inner position when “L”

\*1 Loading motor (M203) control

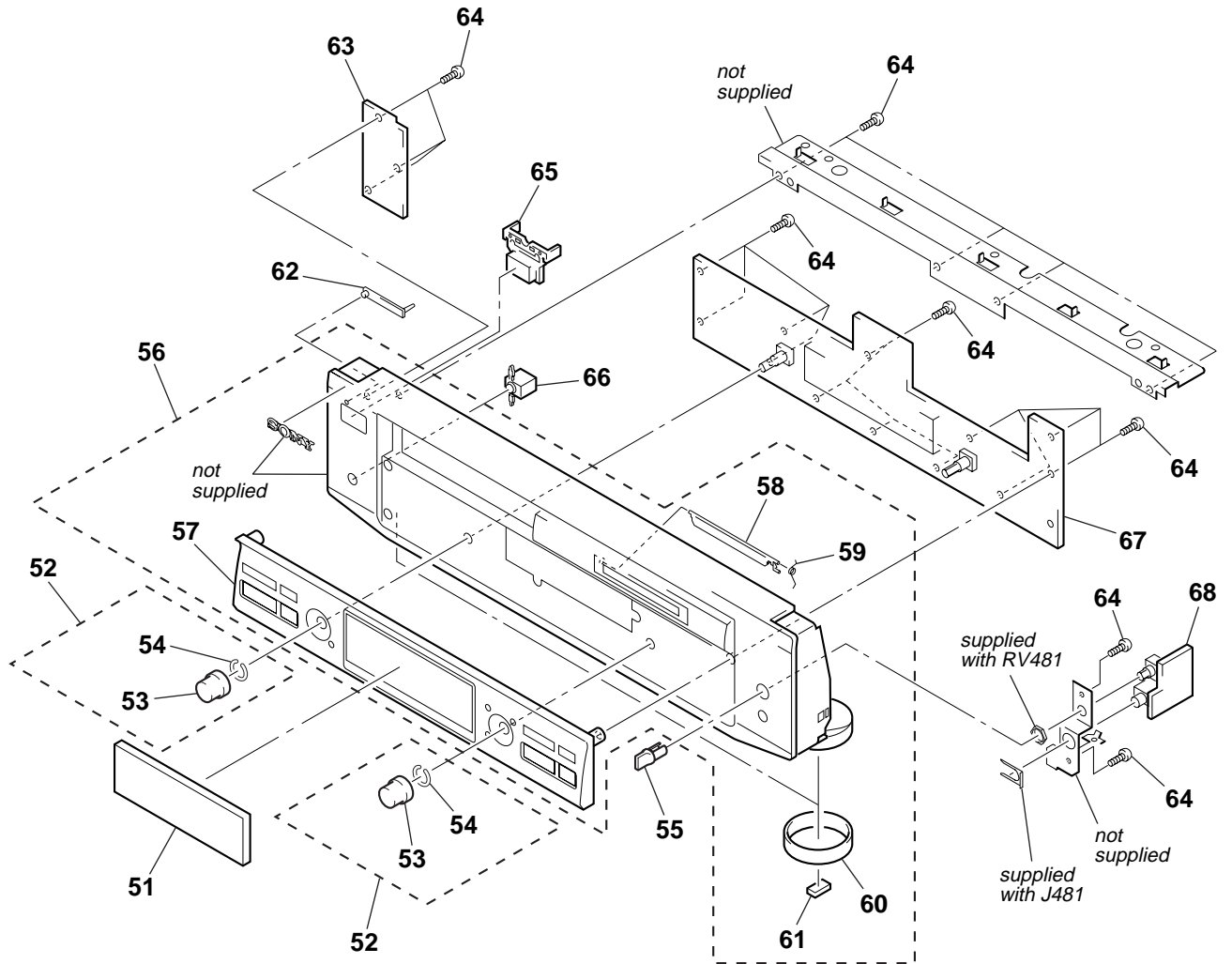
Terminal \ Mode	LOADING	EJECT	BRAKE	RUN IDLE
LDIN (pin 54)	“L”	“H”	“L”	“H”
LDOUT (pin 55)	“H”	“L”	“L”	“H”

Pin No.	Pin Name	I/O	Description
78	MNT0 (FOK)	I	Focus OK signal input from the CXD2656AR (IC121) “H” is input when focus is on (“L”: NG)
79	SCL	O	Clock signal output to the EEPROM (IC171)
80	MNT2 (XBUSY)	I	Busy signal input from the CXD2656AR (IC121)
81	LINE SEL3	O	Audio line selection output terminal
82	CSET1	I	Destination setting terminal (pull down in this set)
83	CSET0	I	Destination setting terminal (pull down in this set)
84 to 88	NC	O	Not used (open)
89	LEVEL L	I	L-ch level input from the CD mechanism controller (IC501)
90	LEVEL R	I	R-ch level input from the CD mechanism controller (IC501)
91	NC	O	Not used (open)
92	KEY4	I	Key input terminal (A/D input) S741 to S746 (■ (MD), ■■ (MD), ▷ (MD), ►► (MD), ● REC (MD), ≙ EJECT keys input)
93	KEY3	I	Key input terminal (A/D input) S731 to S736 (◀◀ (MD), YES, MENU/NO, CD SYNC HIGH, CD SYNC NORMAL, ≙ OPEN/CLOSE keys input)
94	KEY2	I	Key input terminal (A/D input) S721 to S726 (⏪ AMS ▷⏩ (MD), CLEAR (MD), TIME (MD), PLAY MODE (MD), INPUT, DISPLAY keys input)
95	KEY1	I	Key input terminal (A/D input) S711 to S716 (PLAY MODE (CD), TIME (CD), CLEAR (CD), REC-IT (CD), ►► (CD), ◀◀ (CD) keys input)
96	AVSS	—	Ground terminal
97	KEY0	I	Key input terminal (A/D input) S701 to S705 (⏪ AMS ▷⏩ (CD), ■ (CD), ■■ (CD), ▷ (CD), I/⏻ keys input)
98	VREF	I	Reference voltage (+3.3V) input terminal (for A/D converter)
99	AVCC	—	Power supply terminal (+3.3V) (for analog system )
100	NC	O	Not used (open)



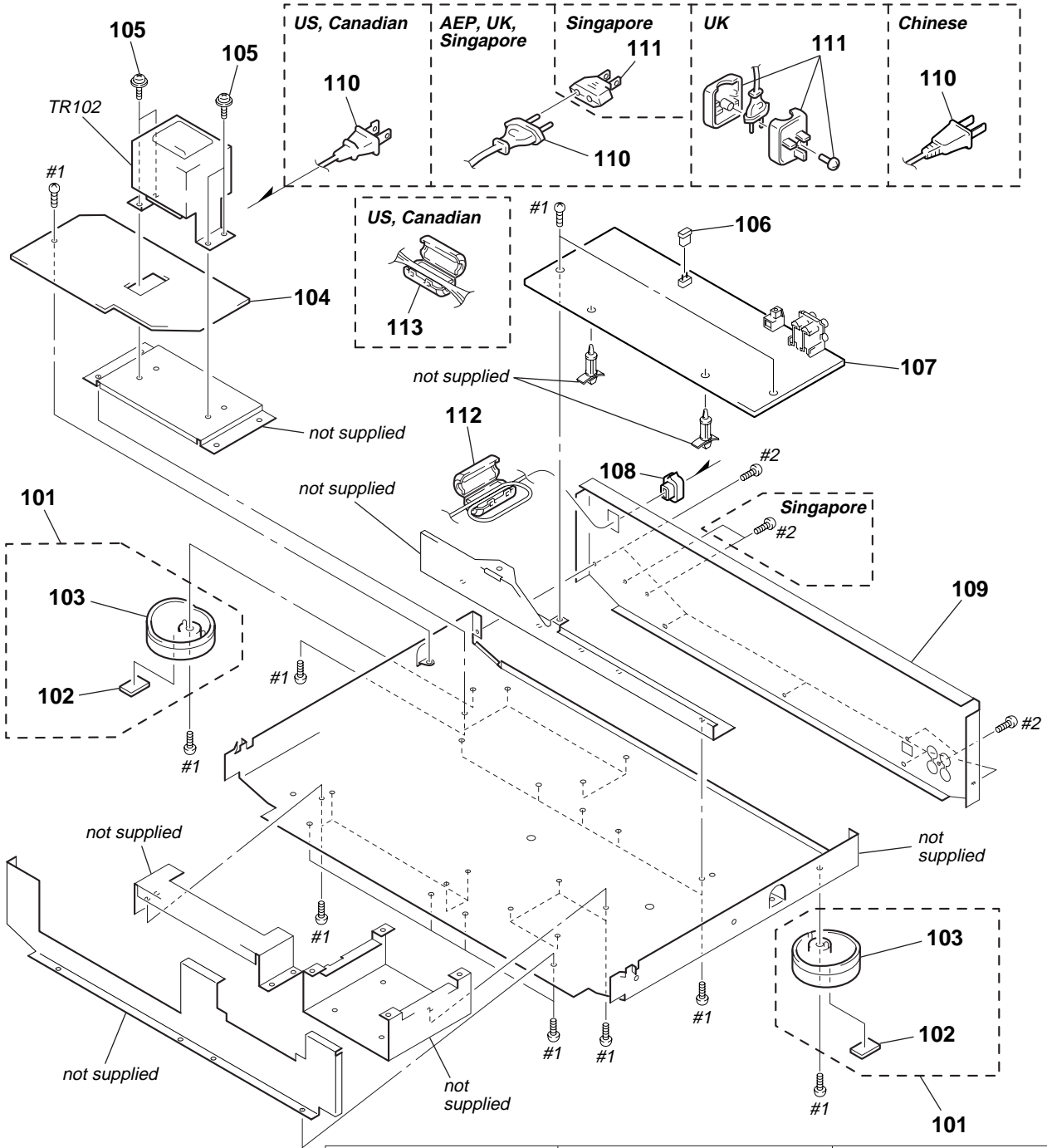


(2) FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-220-710-01	PLATE, INDICATION		60	4-981-435-01	RING (DIA. 50), ORNAMENTAL (GOLD)	
52	A-4672-565-A	KNOB (AMS) ASSY (BLACK)		60	4-981-435-11	RING (DIA. 50), ORNAMENTAL (BLACK)	
53	4-996-687-71	KNOB (AMS) (GOLD)		61	4-983-762-02	CUSHION	
54	3-354-981-01	SPRING (SUS), RING		62	4-996-682-11	INDICATOR	
55	4-950-189-01	KNOB (A) (VOL) (BLACK)		63	1-674-747-11	PWSW BOARD	
55	4-950-189-41	KNOB (A) (VOL) (GOLD)		64	4-951-620-01	SCREW (2.6X8), +BVTP	
56	X-4951-780-1	PANEL ASSY, FRONT (BLACK)		65	4-996-683-21	BUTTON (POWER) (BLACK)	
56	X-4951-781-1	PANEL ASSY, FRONT (GOLD)		65	4-996-683-41	BUTTON (POWER) (GOLD)	
57	X-4951-782-1	ESCUTCHEON (2) ASSY (BLACK)		66	4-220-704-01	WINDOW (RM)	
57	X-4951-783-1	ESCUTCHEON (2) ASSY (GOLD)		67	A-4724-857-A	DISPLAY BOARD, COMPLETE (EXCEPT US, Canadian)	
58	4-996-690-33	LID (CARTRIDGE)		67	A-4725-025-A	DISPLAY BOARD, COMPLETE (US, Canadian)	
59	4-223-771-01	SPRING (LID)		68	1-674-748-11	HP BOARD	

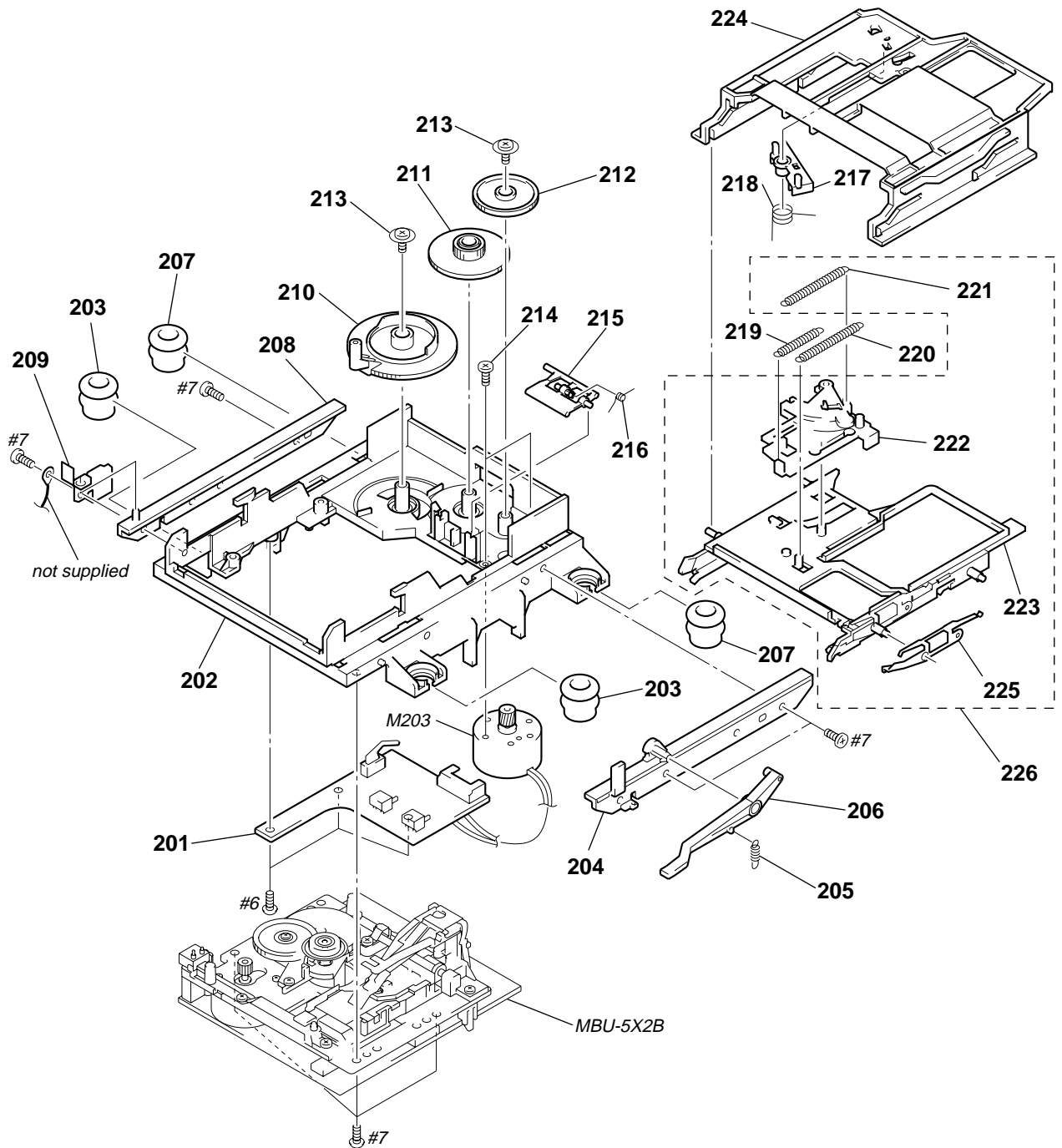
### (3) CHASSIS SECTION



<p>The components identified by mark <math>\Delta</math> or dotted line with mark <math>\triangle</math> are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque <math>\Delta</math> sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>	<p>以阴影和 <math>\Delta</math> 标志来识别的零部件，在安全方面具有关键性。因此只能以规定号码的零部件来更换。</p>
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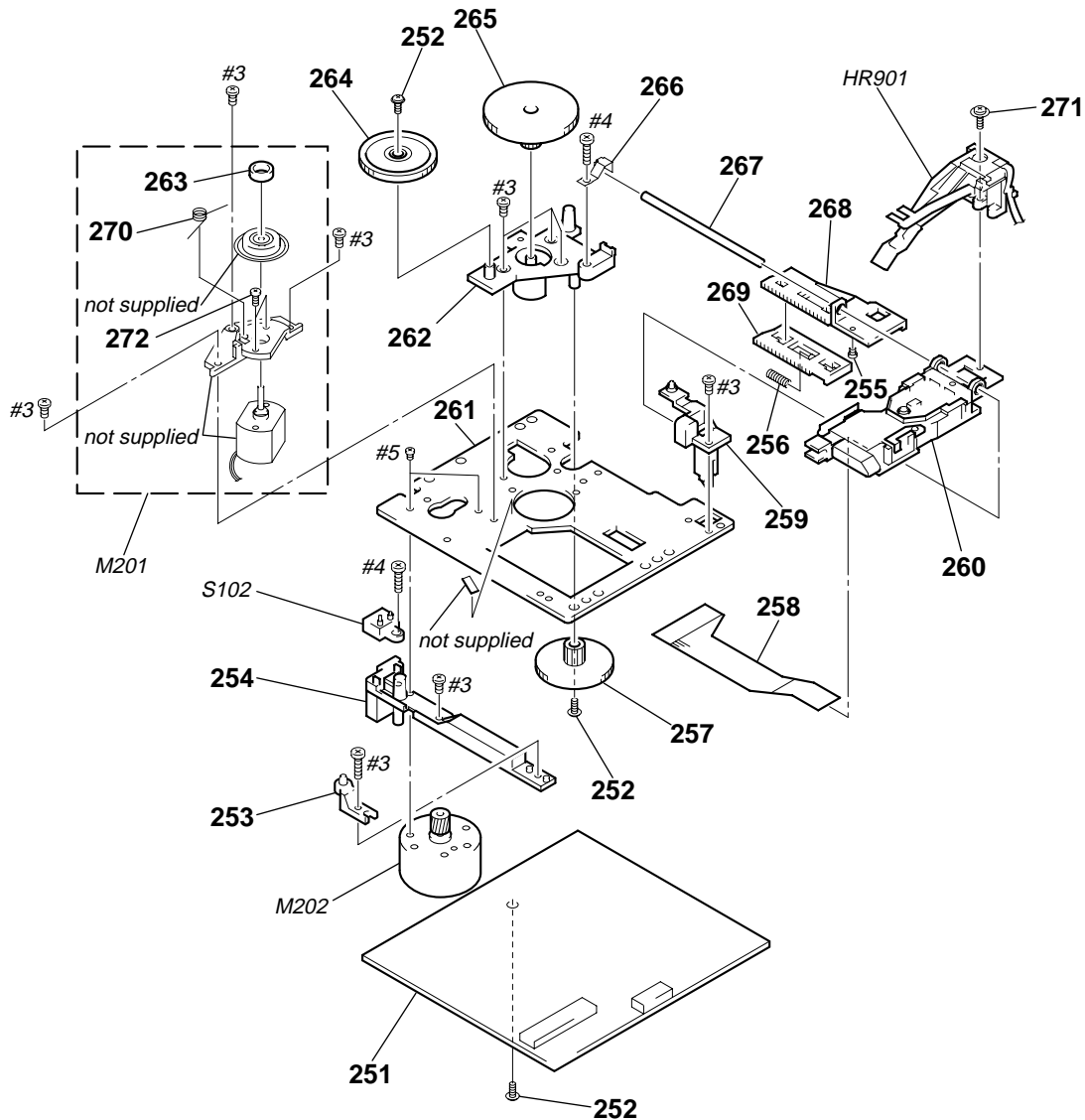
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	X-4947-389-1	FOOT ASSY (F50150S) (BLACK)		109	4-220-708-31	PANEL, BACK (Singapore)	
102	4-983-762-02	CUSHION		109	4-220-708-41	PANEL, BACK (US)	
103	4-983-761-21	FOOT (F50150S) (GOLD)		$\Delta$ 110	1-751-275-11	CORD, POWER (AEP, UK, Singapore)	
104	1-674-745-11	TRANS BOARD		$\Delta$ 110	1-783-531-41	CORD, POWER (US, Canadian)	
105	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6		$\Delta$ 110	1-782-464-31	CORD, POWER (Chinese)	
106	1-569-972-21	SOCKET, SHORT 2P		$\Delta$ 111	1-569-008-21	ADAPTOR, CONVERSION 2P (Singapore)	
107	A-4724-860-A	MAIN BOARD, COMPLETE		$\Delta$ 111	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)	
107	A-4725-028-A	MAIN BOARD, COMPLETE (US, Canadian)	(EXCEPT US, Canadian)	112	1-500-386-11	FILTER, CLAMP (FERRITE CORE)	
108	3-703-244-00	BUSHING (2104), CORD		113	1-543-798-11	FILTER, CLAMP (FERRITE CORE)	(US, Canadian)
109	4-220-708-01	PANEL, BACK (AEP, UK)		$\Delta$ TR102	1-435-083-11	TRANSFORMER, POWER (AEP, UK, Chinese)	
109	4-220-708-11	PANEL, BACK (Canadian)		$\Delta$ TR102	1-435-084-11	TRANSFORMER, POWER (US, Canadian)	
109	4-220-708-52	PANEL, BACK (Chinese)		$\Delta$ TR102	1-435-085-11	TRANSFORMER, POWER (Singapore)	

(4) MD MECHANISM DECK SECTION  
(MDM-5X2B)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 201	1-668-111-11	SW BOARD		215	4-996-227-01	LEVER (HEAD)	
* 202	4-996-217-01	CHASSIS		216	4-996-229-01	SPRING (HEAD LEVER), TORSION	
203	4-996-223-01	INSULATOR (F) (BLACK)		217	4-996-212-01	LEVER (LIMITTER)	
* 204	4-996-218-01	BRACKET (GUIDE R)		218	4-996-213-01	SPRING (LIMITTER), TORSION	
205	4-996-277-01	SPRING (O/C), TENSION		219	4-996-214-01	SPRING (SLIDER), TENSION	
206	4-996-226-01	LEVER (O/C)		220	4-996-216-01	SPRING (HOLDER), TENSION	
207	4-999-347-01	INSULATOR (R) (GREEN)		221	4-210-396-01	SPRING (LOCK), TENSION	
* 208	4-996-225-01	BRACKET (GUIDE L)		222	X-4949-246-1	SLIDER ASSY	
209	4-988-466-21	SPRING (ELECTROSTATIC), LEAF		* 223	X-4949-245-7	HOLDER ASSY	
210	4-996-219-01	GEAR (CAM GEAR)		* 224	4-996-211-01	SLIDER (CAM)	
211	4-996-220-01	GEAR (A)		225	4-998-763-01	SPRING (SHUTTER), LEAF	
212	4-996-221-01	GEAR (B)		226	A-4680-118-J	HOLDER COMPLETE ASSY	
213	4-933-134-01	SCREW (+PTPWH M2.6X6)		M203	X-4949-264-1	MOTOR ASSY, LOADING (MD)	
214	4-996-224-01	SCREW (1.7X3), +PWH					

(5) MD BASE UNIT SECTION  
(MBU-5X2B)



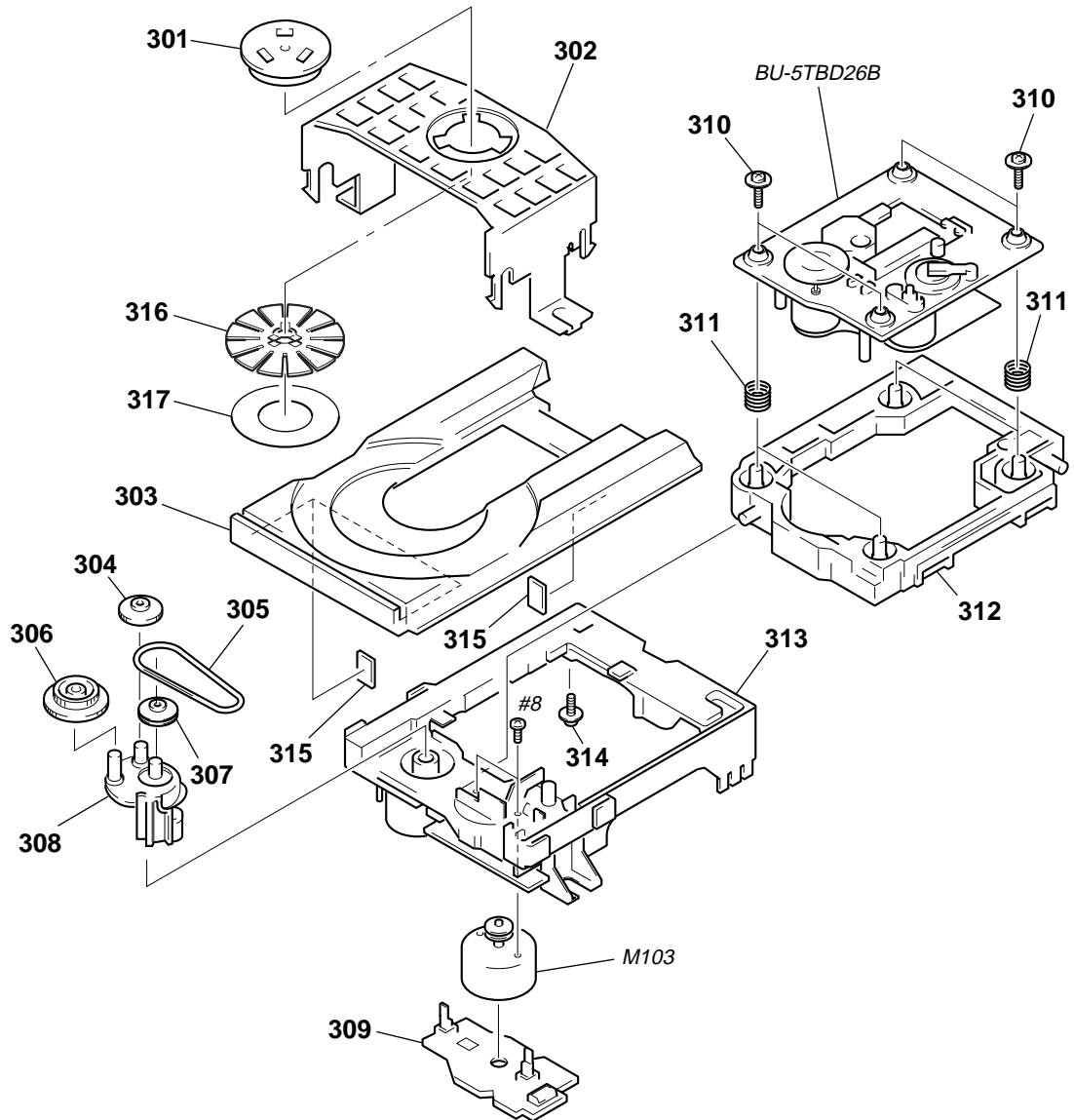
<p>The components identified by mark ▲ or dotted line with mark ▲ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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以阴影和 ▲ 标志来识别的零部件，在安全方面具有关键性。因此只能以规定号码的零部件来更换。

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
251	A-4724-855-A	BD (MD) BOARD, COMPLETE		264	4-996-260-01	GEAR (SL-A)	
252	3-372-761-01	SCREW (M1.7), TAPPING		265	4-996-261-01	GEAR (SL-B)	
* 253	4-996-267-01	BASE (BU-D)		266	4-996-264-01	SPRING (SHAFT), LEAF	
* 254	4-996-255-01	BASE (BU-C)		267	4-996-265-01	SHAFT, MAIN	
255	4-900-590-01	SCREW, PRECISION SMALL		268	4-996-256-01	SL (BASE)	
256	4-996-258-01	SPRING, COMPRESSION		269	4-996-257-01	RACK (SL)	
257	4-996-262-01	GEAR (SL-C)		270	4-996-263-01	SPRING (CLV), TORSION	
258	1-667-954-11	FLEXIBLE BOARD		271	4-988-560-01	SCREW (+P 1.7X6)	
* 259	4-996-253-01	BASE (BU-A)		272	4-211-036-01	SCREW (1.7X2.5), +PWH	
▲ 260	8-583-056-01	OPTICAL PICK-UP KMS-262A/J1N		HR901	1-500-502-11	HEAD, OVER WRITE	
* 261	4-996-252-01	CHASSIS, BU		M201	A-4672-855-A	MOTOR ASSY, SPINDLE (MD)	
* 262	4-996-254-01	BASE (BU-B)		M202	A-4672-474-A	MOTOR ASSY, SLED (MD)	
263	4-967-688-11	MAGNET, ABSORPTION		S102	1-762-148-21	SWITCH, PUSH (2 KEY)	

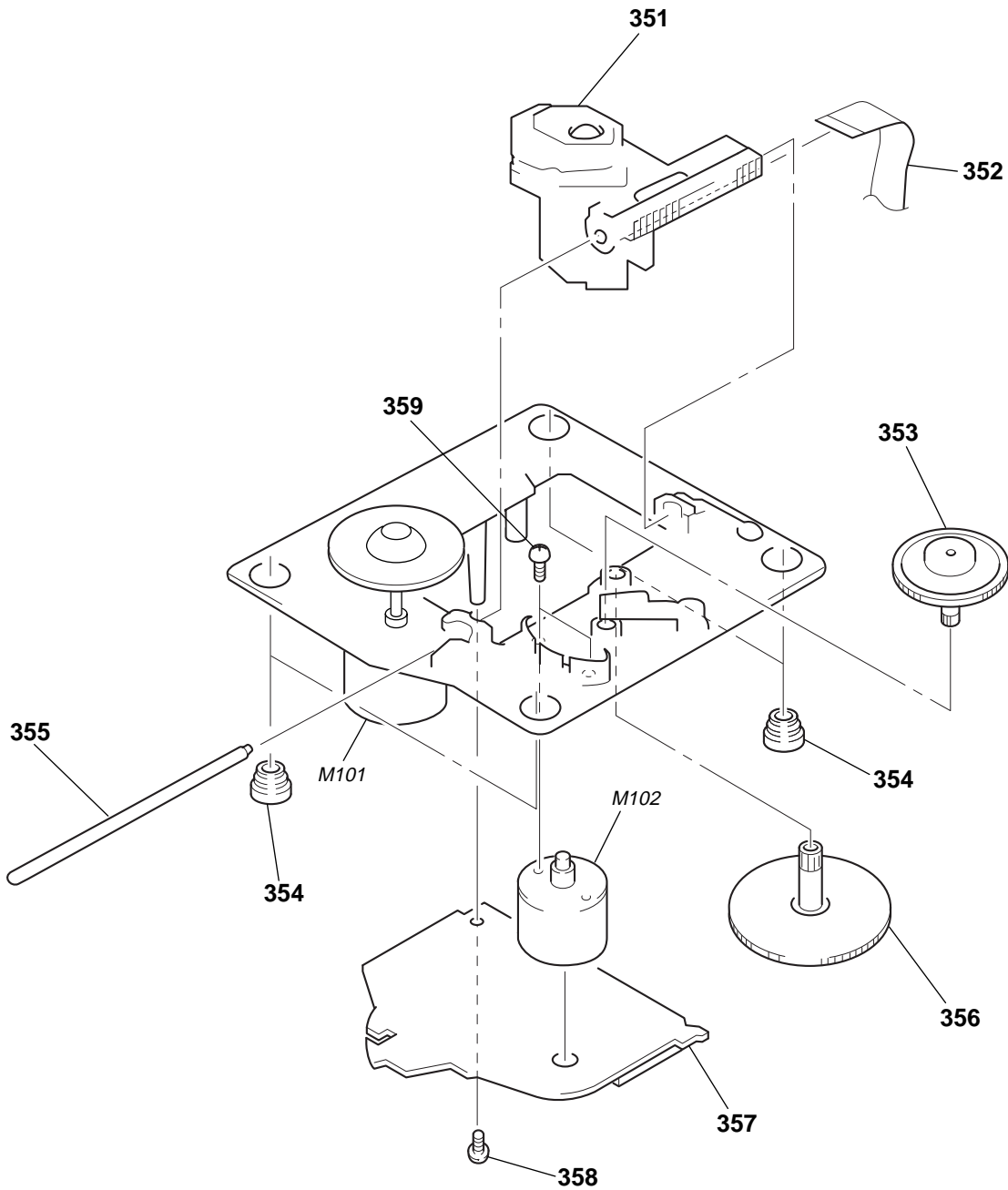
(REFLECT DET, PROTECT DET)

(6) CD MECHANISM DECK SECTION  
(CDM14H-5TBD26B)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	4-222-283-01	PULLEY (AT) (CDM14)		310	4-985-672-01	SCREW (+PTPWHM2.6), FLOATING	
302	4-933-110-41	HOLDER (MG)		311	4-959-996-01	SPRING (932), COMPRESSION	
303	4-213-448-12	TABLE (BL), DISC		312	4-933-129-01	HOLDER (BU)	
304	4-967-268-01	GEAR (C)		313	4-933-111-41	CHASSIS (MD)	
305	4-927-649-01	BELT		* 314	4-917-583-21	BRACKET, YOKE	
306	4-933-107-01	GEAR (PL)		315	4-925-315-31	DAMPER	
307	4-927-651-01	PULLEY (S)		316	X-4952-522-1	PULLEY (AT) ASSY	
308	4-933-109-01	CAM		317	4-220-951-02	SHEET (KH)	
* 309	1-645-721-11	LOADING BOARD		M103	A-4604-363-A	MOTOR (L) ASSY (LOADING) (CD)	

(7) CD BASE UNIT SECTION  
(BU-5TBD26B)



<p>The components identified by mark <math>\triangle</math> or dotted line with mark <math>\triangle</math> are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque <math>\triangle</math> sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>	<p>以阴影和 <math>\triangle</math> 标志来识别的零部件，在安全方面具有关键性。因此只能以规定号码的零部件来更换。</p>
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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
$\triangle$ 351	8-820-113-01	OPTICAL PICK-UP KSS-213BH/Z-NP		357	A-4724-886-A	BD (CD) BOARD, COMPLETE	
352	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)		358	4-951-620-01	SCREW (2.6X8), +BVTP	
353	4-917-567-01	GEAR (M)		359	3-713-786-51	SCREW +P 2X3	
354	4-222-457-01	INSULATOR (14H)		M101	X-4952-658-1	MOTOR ASSY (SPINDLE) (CD)	
355	4-917-565-01	SHAFT, SLED		M102	X-4917-504-1	MOTOR ASSY (SLED) (CD)	
356	4-917-564-01	GEAR (P), FLATNESS					

# SECTION 8 ELECTRICAL PARTS LIST

BD (CD)

**NOTE:**

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS  
All resistors are in ohms.  
METAL: Metal-film resistor.  
METAL OXIDE: Metal oxide-film resistor.  
F: nonflammable

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

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

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

以阴影和  $\Delta$  标志来识别的零部件，在安全方面具有关键性，因此只能以规定号码的零部件来更换。

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-4724-886-A	BD (CD) BOARD, COMPLETE					
		*****					
		< CAPACITOR >					
C1	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C10	1-107-812-11	TANTALUM CHIP	4.7uF	20%	6.3V		
C39	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C42	1-163-231-11	CERAMIC CHIP	15PF	5%	50V		
C101	1-135-155-21	TANTALUM CHIP	4.7uF	10%	16V		
C102	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C103	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C105	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C106	1-163-125-00	CERAMIC CHIP	220PF	5%	50V		
C107	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C108	1-163-125-00	CERAMIC CHIP	220PF	5%	50V		
C112	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		
C113	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V		
C114	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
C115	1-113-503-11	CERAMIC CHIP	0.0039uF	5%	25V		
C116	1-163-127-00	CERAMIC CHIP	270PF	5%	50V		
C117	1-164-222-11	CERAMIC CHIP	0.22uF	25V			
C119	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
C131	1-135-216-11	TANTALUM CHIP	10uF	20%	10V		
C132	1-126-209-11	ELECT CHIP	100uF	20%	4V		
C133	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
C134	1-126-607-11	ELECT CHIP	47uF	20%	4V		
C135	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C136	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C137	1-164-346-11	CERAMIC CHIP	1uF	16V			
C138	1-164-346-11	CERAMIC CHIP	1uF	16V			
C142	1-163-231-11	CERAMIC CHIP	15PF	5%	50V		
C143	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
C145	1-109-982-11	CERAMIC CHIP	1uF	10%	10V		
C146	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V		
C147	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C148	1-126-607-11	ELECT CHIP	47uF	20%	4V		
C171	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C172	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V		
C173	1-163-235-11	CERAMIC CHIP	22PF	5%	50V		
C174	1-163-235-11	CERAMIC CHIP	22PF	5%	50V		
C175	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C176	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
C179	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C181	1-163-033-00	CERAMIC CHIP	0.022uF	50V			
C184	1-164-222-11	CERAMIC CHIP	0.22uF	25V			
C185	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V		
C187	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V		
C191	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C199	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C221	1-135-155-21	TANTALUM CHIP	4.7uF	10%	16V		
C222	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
C283	1-163-033-00	CERAMIC CHIP	0.022uF	50V			
C297	1-163-038-00	CERAMIC CHIP	0.1uF	25V			
		< CONNECTOR >					
CN101	1-784-836-21	CONNECTOR, FFC (LIF (NON-ZIF)) 29P					
CN102	1-777-937-11	CONNECTOR, FFC/FPC 16P					
* CN103	1-580-055-21	PIN, CONNECTOR (SMD) 2P					
		< IC >					
IC101	8-752-389-34	IC CXD2585Q					
IC115	8-759-082-61	IC TC4W53FU (TE12R)					
IC131	8-752-085-51	IC CXA2568M-T6					
IC171	8-759-549-28	IC BA5974FP-E2					
IC181	8-759-058-43	IC NJM3404AV (TE2)					
IC182	8-759-448-71	IC BU4053BCFV-E2					
IC191	8-759-335-52	IC BA6195FP-YT2					
		< TRANSISTOR >					
Q131	8-729-010-08	TRANSISTOR	MSB710-RT1				
		< RESISTOR >					
R1	1-216-103-00	METAL CHIP	180K	5%	1/10W		
R4	1-216-103-00	METAL CHIP	180K	5%	1/10W		
R42	1-216-077-11	RES, CHIP	15K	5%	1/10W		
R51	1-216-295-00	SHORT	0				
R61	1-216-295-00	SHORT	0				
R102	1-216-295-00	SHORT	0				
R103	1-216-049-11	RES, CHIP	1K	5%	1/10W		
R104	1-216-097-00	RES, CHIP	100K	5%	1/10W		
R106	1-216-077-11	RES, CHIP	15K	5%	1/10W		
R107	1-216-097-00	RES, CHIP	100K	5%	1/10W		
R108	1-216-077-11	RES, CHIP	15K	5%	1/10W		
R111	1-216-085-00	METAL CHIP	33K	5%	1/10W		
R112	1-216-073-00	METAL CHIP	10K	5%	1/10W		



**BD (CD)**

**BD (MD)**

Ref. No.	Part No.	Description	Remark
R113	1-216-097-00	RES, CHIP	100K 5% 1/10W
R114	1-216-025-00	RES, CHIP	100 5% 1/10W
R116	1-216-073-00	METAL CHIP	10K 5% 1/10W
R117	1-216-049-11	RES, CHIP	1K 5% 1/10W
R118	1-216-073-00	METAL CHIP	10K 5% 1/10W
R119	1-216-121-00	RES, CHIP	1M 5% 1/10W
R121	1-216-037-00	RES, CHIP	330 5% 1/10W
R122	1-216-001-00	RES, CHIP	10 5% 1/10W
R123	1-216-001-00	RES, CHIP	10 5% 1/10W
R124	1-216-001-00	RES, CHIP	10 5% 1/10W
R125	1-216-073-00	METAL CHIP	10K 5% 1/10W
R129	1-216-295-00	SHORT	0
R132	1-216-001-00	METAL CHIP	10 5% 1/10W
R133	1-216-003-11	RES, CHIP	12 5% 1/10W
R138	1-216-103-00	METAL CHIP	180K 5% 1/10W
R139	1-216-103-00	METAL CHIP	180K 5% 1/10W
R142	1-216-073-00	METAL CHIP	10K 5% 1/10W
R144	1-216-121-00	RES, CHIP	1M 5% 1/10W
R146	1-216-121-00	RES, CHIP	1M 5% 1/10W
R169	1-216-295-00	SHORT	0
R172	1-216-308-00	METAL CHIP	4.7 5% 1/10W
R181	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R182	1-216-085-00	RES, CHIP	33K 5% 1/10W
R184	1-216-097-00	RES, CHIP	100K 5% 1/10W
R185	1-216-105-00	RES, CHIP	220K 5% 1/10W
R187	1-216-101-00	METAL CHIP	150K 5% 1/10W
R193	1-216-073-00	METAL CHIP	10K 5% 1/10W
R195	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R196	1-216-073-00	METAL CHIP	10K 5% 1/10W
R197	1-216-073-00	METAL CHIP	10K 5% 1/10W
R200	1-216-295-00	SHORT	0
R201	1-216-295-00	SHORT	0
R210	1-216-073-00	METAL CHIP	10K 5% 1/10W
R211	1-216-073-00	METAL CHIP	10K 5% 1/10W
R283	1-216-113-00	METAL CHIP	470K 5% 1/10W
R284	1-216-117-00	METAL CHIP	680K 5% 1/10W
R285	1-216-109-00	RES, CHIP	330K 5% 1/10W
R292	1-216-117-00	METAL CHIP	680K 5% 1/10W
< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (1KEY) (LIMIT)	
*****			
A-4724-855-A	BD (MD) BOARD, COMPLETE		
*****			
< CAPACITOR >			
C101	1-125-822-11	TANTALUM	10uF 20% 10V
C102	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C103	1-125-822-11	TANTALUM	10uF 20% 10V
C104	1-125-822-11	TANTALUM	10uF 20% 10V
C105	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF 5% 50V
C107	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C108	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C109	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V
C111	1-164-344-11	CERAMIC CHIP	0.068uF 10% 25V

Ref. No.	Part No.	Description	Remark
C112	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C113	1-109-982-11	CERAMIC CHIP	1uF 10% 10V
C115	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V
C116	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V
C117	1-163-809-11	CERAMIC CHIP	0.047uF 10% 25V
C118	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C119	1-125-822-11	TANTALUM	10uF 20% 10V
C121	1-125-822-11	TANTALUM	10uF 20% 10V
C122	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C123	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C124	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C127	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C128	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C129	1-107-823-11	CERAMIC CHIP	0.01uF 10% 16V
C130	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C131	1-163-023-00	CERAMIC CHIP	0.015uF 5% 50V
C132	1-107-823-11	CERAMIC CHIP	0.47uF 10% 16V
C133	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V
C134	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C135	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C136	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C139	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C142	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C143	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C144	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C151	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C152	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C153	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C156	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C158	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C160	1-104-601-11	ELECT CHIP	10uF 20% 10V
C161	1-104-601-11	ELECT CHIP	10uF 20% 10V
C163	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C164	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C167	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C168	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C169	1-125-822-11	TANTALUM	10uF 20% 10V
C171	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C181	1-104-913-11	TANTALUM CHIP	10uF 20% 16V
C183	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C184	1-117-970-11	ELECT CHIP	22uF 20% 10V
C185	1-128-795-11	ELECT CHIP	470PF 10% 630V
C187	1-104-913-11	TANTALUM CHIP	10uF 20% 16V
C188	1-163-021-11	CERAMIC CHIP	0.01uF 10% 50V
C189	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V
C190	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C191	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C197	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C198	1-104-913-11	TANTALUM CHIP	10uF 20% 16V
C199	1-163-038-00	CERAMIC CHIP	0.1uF 25V
< CONNECTOR >			
CN101	1-569-479-21	CONNECTOR, FPC 21P	
CN102	1-784-835-21	CONNECTOR, FFC (LIF (NON-ZIF)) 27P	
CN103	1-784-834-21	CONNECTOR, FFC (LIF (NON-ZIF)) 23P	
CN104	1-770-687-11	CONNECTOR, FFC/FPC 4P	
CN110	1-695-440-21	PIN, CONNECTOR (PC BOARD) 6P	



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< DIODE >				R119	1-216-295-00	SHORT	0
D101	8-719-988-61	DIODE 1SS355TE-17		R120	1-216-025-00	RES, CHIP	100 5% 1/10W
D181	8-719-046-86	DIODE F1J6TP		R121	1-216-097-00	RES, CHIP	100K 5% 1/10W
D183	8-719-046-86	DIODE F1J6TP		R123	1-216-295-00	SHORT	0
< IC/TRANSISTOR >				R124	1-216-025-00	RES, CHIP	100 5% 1/10W
IC101	8-752-080-95	IC CXA2523AR		R125	1-216-025-00	RES, CHIP	100 5% 1/10W
IC103	8-729-903-10	TRANSISTOR FMW1-T-148		R126	1-414-235-22	FERRITE BEAD	0
IC121	8-752-390-16	IC CXD2656AR		R130	1-216-295-00	SHORT	0
IC124	8-759-599-51	IC MSM51V17400D-50TS-K		R131	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC152	8-759-430-25	IC BH6511FS-E2		R132	1-216-097-00	RES, CHIP	100K 5% 1/10W
IC171	8-759-487-04	IC BR24C02F-E2		R133	1-216-117-00	METAL CHIP	680K 5% 1/10W
IC181	8-759-481-17	IC MC74ACT08DTR2		R134	1-216-049-11	RES, CHIP	1K 5% 1/10W
IC192	8-759-460-72	IC BA033FP-E2		R135	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
< COIL/FERRITE BEAD/SHORT >				R136	1-216-049-11	RES, CHIP	1K 5% 1/10W
L101	1-414-813-11	FERRITE	0uH	R137	1-216-295-00	SHORT	0
L102	1-414-813-11	FERRITE	0uH	R140	1-216-029-00	METAL CHIP	150 5% 1/10W
L103	1-414-813-11	FERRITE	0uH	R142	1-216-073-00	METAL CHIP	10K 5% 1/10W
L105	1-414-813-11	FERRITE	0uH	R143	1-216-073-00	METAL CHIP	10K 5% 1/10W
L106	1-414-813-11	FERRITE	0uH	R144	1-216-025-00	RES, CHIP	100 5% 1/10W
L121	1-414-813-11	FERRITE	0uH	R145	1-216-073-00	METAL CHIP	10K 5% 1/10W
L122	1-414-813-11	FERRITE	0uH	R146	1-216-037-00	METAL CHIP	330 5% 1/10W
L151	1-412-029-11	INDUCTOR CHIP	10uH	R147	1-216-025-00	RES, CHIP	100 5% 1/10W
L152	1-412-029-11	INDUCTOR CHIP	10uH	R148	1-216-045-00	METAL CHIP	680 5% 1/10W
L153	1-412-032-11	INDUCTOR CHIP	100uH	R149	1-216-073-00	METAL CHIP	10K 5% 1/10W
L154	1-412-032-11	INDUCTOR CHIP	100uH	R150	1-216-295-00	SHORT	0
L161	1-414-813-11	FERRITE	0uH	R151	1-216-073-00	METAL CHIP	10K 5% 1/10W
L162	1-414-813-11	FERRITE	0uH	R152	1-216-073-00	METAL CHIP	10K 5% 1/10W
L181	1-216-295-00	SHORT	0	R153	1-216-033-00	RES, CHIP	220 5% 1/10W
< TRANSISTOR >				R158	1-216-097-00	RES, CHIP	100K 5% 1/10W
Q101	8-729-403-35	TRANSISTOR	UN5113-TX	R159	1-216-097-00	RES, CHIP	100K 5% 1/10W
Q102	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR	R160	1-216-295-00	SHORT	0
Q103	8-729-402-93	TRANSISTOR	UN5214-TX	R161	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
Q104	8-729-402-93	TRANSISTOR	UN5214-TX	R162	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
Q162	8-729-101-07	TRANSISTOR	2SB798-T1DK	R163	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
Q163	8-729-403-35	TRANSISTOR	UN5113-TX	R164	1-216-045-00	METAL CHIP	680 5% 1/10W
Q181	8-729-048-87	FET	2SJ518AZTR	R165	1-216-097-00	RES, CHIP	100K 5% 1/10W
Q182	8-729-048-88	FET	2SK2788VYTR	R166	1-216-298-00	METAL CHIP	2.2 5% 1/10W
< RESISTOR/FERRITE BEAD >				R167	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R103	1-216-049-11	RES, CHIP	1K 5% 1/10W	R169	1-219-724-11	METAL CHIP	1 1% 1/4W
R104	1-216-073-00	METAL CHIP	10K 5% 1/10W	R170	1-216-073-00	METAL CHIP	10K 5% 1/10W
R105	1-216-065-00	RES, CHIP	4.7K 5% 1/10W	R171	1-216-073-00	METAL CHIP	10K 5% 1/10W
R106	1-216-133-00	METAL CHIP	3.3M 5% 1/10W	R175	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R107	1-216-113-00	METAL CHIP	470K 5% 1/10W	R177	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R108	1-216-017-00	RES, CHIP	47 5% 1/10W	R179	1-216-085-00	METAL CHIP	33K 5% 1/10W
R109	1-216-295-00	SHORT	0	R180	1-216-073-00	METAL CHIP	10K 5% 1/10W
R110	1-216-081-00	METAL CHIP	22K 5% 1/10W	R182	1-216-089-00	RES, CHIP	47K 5% 1/10W
R111	1-216-295-00	SHORT	0	R183	1-216-089-00	RES, CHIP	47K 5% 1/10W
R112	1-216-689-11	METAL CHIP	39K 0.5% 1/10W	R184	1-216-073-00	METAL CHIP	10K 5% 1/10W
R113	1-216-049-11	RES, CHIP	1K 5% 1/10W	R185	1-216-081-00	METAL CHIP	22K 5% 1/10W
R114	1-216-295-00	SHORT	0	R186	1-216-089-00	RES, CHIP	47K 5% 1/10W
R115	1-216-049-11	RES, CHIP	1K 5% 1/10W	R188	1-216-073-00	METAL CHIP	10K 5% 1/10W
R116	1-216-295-00	SHORT	0	R189	1-216-073-00	METAL CHIP	10K 5% 1/10W
R117	1-216-113-00	METAL CHIP	470K 5% 1/10W	R190	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R195	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R196	1-216-295-00	SHORT	0
				R197	1-216-295-00	SHORT	0
				R198	1-216-296-00	SHORT	0

<b>BD (MD)</b>	<b>DISPLAY</b>
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Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S101	1-762-596-21	SWITCH, PUSH (1 KEY) (LIMIT)	
S102	1-762-148-21	SWITCH, PUSH (2 KEY) (REFLECT RATE DETECT, PROTECT DETECT)	
		< VIBRATOR >	
X102	1-781-569-21	OSCILLATOR, CRYSTAL (90.3168MHZ)	
*****			
	A-4724-857-A	DISPLAY BOARD, COMPLETE (EXCEPT US, Canadian)	
	A-4725-025-A	DISPLAY BOARD, COMPLETE (US, Canadian) *****	
*	4-955-901-01	CUSHION (FL)	
*	4-996-686-11	HOLDER (FL)	
		< CAPACITOR >	
C751	1-162-290-31	CERAMIC 470PF 10% 50V	
C752	1-162-290-31	CERAMIC 470PF 10% 50V	
C753	1-164-159-11	CERAMIC 0.1uF 50V	
C754	1-126-795-11	ELECT 10uF 20% 50V	
C755	1-164-159-11	CERAMIC 0.1uF 50V	
C756	1-162-290-31	CERAMIC 470PF 10% 50V	
C757	1-162-290-31	CERAMIC 470PF 10% 50V	
C758	1-162-290-31	CERAMIC 470PF 10% 50V	
C759	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C760	1-162-213-31	CERAMIC 39PF 5% 50V	
C761	1-126-795-11	ELECT 10uF 20% 50V	
C762	1-126-795-11	ELECT 10uF 20% 50V	
C792	1-164-159-11	CERAMIC 0.1uF 50V (EXCEPT US, Canadian)	
		< CONNECTOR >	
CN701	1-779-556-11	CONNECTOR, FFC (LIF (NON-ZIF))19P	
* CN702	1-691-670-11	CONNECTOR, BOARD TO BOARD 5P	
		< DIODE >	
D751	8-719-046-44	LED SEL5221S-TP15 (CD SYNC NORMAL)	
D752	8-719-046-44	LED SEL5221S-TP15 (CD SYNC HIGH)	
		< FLUORESCENT INDICATOR TUBE >	
FL751	1-517-904-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC751	8-759-525-49	IC MSM9201-02GS-K	
		< TRANSISTOR >	
Q751	8-729-900-80	TRANSISTOR UN4211-TA	
Q752	8-729-900-80	TRANSISTOR UN4211-TA	
Q753	8-729-620-05	TRANSISTOR 2SC2603TP-EF	
Q754	8-729-620-05	TRANSISTOR 2SC2603TP-EF	
		< RESISTOR >	
R701	1-249-421-11	CARBON 2.2K 5% 1/4W	
R702	1-247-843-11	CARBON 3.3K 5% 1/4W	
R703	1-249-425-11	CARBON 4.7K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R704	1-249-429-11	CARBON 10K 5% 1/4W	
R711	1-249-421-11	CARBON 2.2K 5% 1/4W	
R712	1-247-843-11	CARBON 3.3K 5% 1/4W	
R713	1-249-425-11	CARBON 4.7K 5% 1/4W	
R714	1-249-429-11	CARBON 10K 5% 1/4W	
R715	1-249-435-11	CARBON 33K 5% 1/4W	
R721	1-249-421-11	CARBON 2.2K 5% 1/4W	
R722	1-247-843-11	CARBON 3.3K 5% 1/4W	
R723	1-249-425-11	CARBON 4.7K 5% 1/4W	
R724	1-249-429-11	CARBON 10K 5% 1/4W	
R725	1-249-435-11	CARBON 33K 5% 1/4W	
R731	1-249-421-11	CARBON 2.2K 5% 1/4W	
R732	1-247-843-11	CARBON 3.3K 5% 1/4W	
R733	1-249-425-11	CARBON 4.7K 5% 1/4W	
R734	1-249-429-11	CARBON 10K 5% 1/4W	
R735	1-249-435-11	CARBON 33K 5% 1/4W	
R741	1-249-421-11	CARBON 2.2K 5% 1/4W	
R742	1-247-843-11	CARBON 3.3K 5% 1/4W	
R743	1-249-425-11	CARBON 4.7K 5% 1/4W	
R744	1-249-429-11	CARBON 10K 5% 1/4W	
R745	1-249-435-11	CARBON 33K 5% 1/4W	
R751	1-249-409-11	CARBON 220 5% 1/4W	
R752	1-249-409-11	CARBON 220 5% 1/4W	
R753	1-247-807-31	CARBON 100 5% 1/4W	
R754	1-247-807-31	CARBON 100 5% 1/4W	
R755	1-249-441-11	CARBON 100K 5% 1/4W	
R756	1-249-441-11	CARBON 100K 5% 1/4W	
R757	1-247-807-31	CARBON 100 5% 1/4W	
R758	1-247-807-31	CARBON 100 5% 1/4W	
R759	1-247-807-31	CARBON 100 5% 1/4W	
R760	1-247-807-31	CARBON 100 5% 1/4W	
R761	1-247-843-11	CARBON 3.3K 5% 1/4W	
		< SWITCH >	
S701	1-475-543-11	ENCODER, ROTARY (◀◀ AMS ▶▶▶ PUSH ENTER (CD))	
S702	1-762-875-21	SWITCH, KEYBOARD (■ CD))	
S703	1-762-875-21	SWITCH, KEYBOARD (■ (CD))	
S704	1-762-875-21	SWITCH, KEYBOARD (▷ (CD))	
S711	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE CD)	
S712	1-762-875-21	SWITCH, KEYBOARD (TIME CD)	
S713	1-762-875-21	SWITCH, KEYBOARD (CLEAR (CD))	
S714	1-762-875-21	SWITCH, KEYBOARD (REC-IT (CD))	
S715	1-762-875-21	SWITCH, KEYBOARD (▶▶ (CD))	
S716	1-762-875-21	SWITCH, KEYBOARD (◀◀ (CD))	
S721	1-475-543-11	ENCODER, ROTARY (◀◀ ANS ▶▶▶ PUSH ENTER (MD))	
S722	1-762-875-21	SWITCH, KEYBOARD (CLEAR (CD))	
S723	1-762-875-21	SWITCH, KEYBOARD (TIME MD)	
S724	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE MD)	
S725	1-762-875-21	SWITCH, KEYBOARD (INPUT)	
S726	1-762-875-21	SWITCH, KEYBOARD (DISPLAY)	
S731	1-762-875-21	SWITCH, KEYBOARD (◀◀ (CD))	
S732	1-762-875-21	SWITCH, KEYBOARD (YES)	
S733	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)	
S734	1-762-875-21	SWITCH, KEYBOARD (CD SYNC HIGH)	
S735	1-762-875-21	SWITCH, KEYBOARD (CD SYNC NORMAL)	
S736	1-762-875-21	SWITCH, KEYBOARD (≡ OPEN/EJECT)	

**DISPLAY**

**HP**

**LOADING**

**MAIN**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
S741	1-762-875-21	SWITCH, KEYBOARD (■ (MD))				< CAPACITOR/RESISTOR/SHORT >	
S742	1-762-875-21	SWITCH, KEYBOARD (■ (MD))		C201	1-136-356-11	FILM 470PF 5%	50V
S743	1-762-875-21	SWITCH, KEYBOARD (▷ (MD))		C202	1-128-551-11	ELECT 22uF 20%	25V
S744	1-762-875-21	SWITCH, KEYBOARD (▶▶ (MD))		C203	1-128-551-11	ELECT 22uF 20%	25V
S745	1-762-875-21	SWITCH, KEYBOARD (REC ● (MD))		C204	1-128-551-11	ELECT 22uF 20%	25V
S746	1-762-875-21	SWITCH, KEYBOARD (≡ EJECT)		C205	1-137-366-11	FILM 0.0022uF 5%	50V
*****							
	1-674-748-11	HP BOARD		C221	1-136-356-11	FILM 470PF 5%	50V
		*****		C222	1-128-551-11	ELECT 22uF 20%	25V
		< CAPACITOR >		C223	1-137-368-11	FILM 0.0047uF 5%	50V
C481	1-162-290-31	CERAMIC 470PF 10%	50V	C224	1-130-471-00	MYLAR 0.001uF 5%	50V
C482	1-162-290-31	CERAMIC 470PF 10%	50V	C225	1-137-358-11	FILM 0.0001uF 5%	50V
C483	1-162-290-31	CERAMIC 470PF 10%	50V	C226	1-137-358-11	FILM 0.0001uF 5%	50V
		(US, Canadian)		C227	1-137-360-11	FILM 220PF 5%	50V
C483	1-164-159-11	CERAMIC 0.1uF	50V	C228	1-128-551-11	ELECT 22uF 20%	25V
		(EXCEPT US, Canadian)		C251	1-165-319-11	CERAMIC CHIP 0.1uF	50V
		< JACK >		C301	1-136-356-11	FILM 470PF 5%	50V
J481	1-770-306-11	JACK (LARGE TYPE) (PHONES) (BLACK)		C302	1-128-551-11	ELECT 22uF 20%	25V
J481	1-784-942-11	JACK (LARGE TYPE) (PHONES) (GOLD)		C303	1-104-665-11	ELECT 100uF 20%	25V
		< FERRITE BEAD >		C304	1-128-551-11	ELECT 22uF 20%	25V
L481	1-410-397-21	FERRITE BEAD INDUCTOR		C305	1-137-366-11	FILM 0.0022uF 5%	50V
L482	1-410-397-21	FERRITE BEAD INDUCTOR		C321	1-136-356-11	FILM 470PF 5%	50V
L483	1-410-397-21	FERRITE BEAD INDUCTOR		C322	1-128-551-11	ELECT 22uF 20%	25V
		< RESISTOR >		C323	1-137-368-11	FILM 0.0047uF 5%	50V
R481	1-249-393-11	CARBON 10 5%	1/4W	C324	1-130-471-00	MYLAR 0.001uF 5%	50V
R482	1-249-393-11	CARBON 10 5%	1/4W	C325	1-137-358-11	FILM 0.0001uF 5%	50V
		< VARIABLE RESISTOR >		C326	1-137-358-11	FILM 0.0001uF 5%	50V
RV481	1-225-882-11	RES, VAR, CARBON 1K/1K (PHONE LEVEL)		C327	1-137-360-11	FILM 220PF 5%	50V
*****							
*	1-645-721-11	LOADING BOARD		C328	1-104-665-11	ELECT 100uF 20%	25V
		*****		C401	1-104-665-11	ELECT 100uF 20%	25V
		< CONNECTOR >		C402	1-165-319-11	CERAMIC CHIP 0.1uF	50V
* CN151	1-568-943-11	PIN, CONNECTOR 5P		C403	1-165-319-11	CERAMIC CHIP 0.1uF	50V
		< SWITCH >		C404	1-126-933-11	ELECT 100uF 20%	16V
S151	1-572-086-11	SWITCH, LEAF (LOAD IN)		C405	1-126-934-11	ELECT 220uF 20%	10V
S152	1-572-086-11	SWITCH, LEAF (LOAD OUT)		C406	1-165-319-11	CERAMIC CHIP 0.1uF	50V
*****							
	A-4724-860-A	MAIN BOARD, COMPLETE		C407	1-165-319-11	CERAMIC CHIP 0.1uF	50V
		(EXCEPT US, Canadian)		C408	1-126-933-11	ELECT 100uF 20%	16V
	A-4725-028-A	MAIN BOARD, COMPLETE (US, Canadian)		C409	1-165-319-11	CERAMIC CHIP 0.1uF	50V
		*****		C415	1-165-319-11	CERAMIC CHIP 0.1uF	50V
*	4-941-237-11	HEAT SINK		C416	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT (B)		C417	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< BATTERY >		C418	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
BT901	1-528-887-11	BATTERY, LITHIUM SECONDARY		C419	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C420	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C421	1-126-934-11	ELECT 220uF 20%	10V
				C422	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C423	1-126-933-11	ELECT 100uF 20%	16V
				C452	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C453	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C501	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C502	1-126-933-11	ELECT 100uF 20%	16V
				C503	1-126-960-11	ELECT 1uF 20%	50V
				C504	1-163-021-11	CERAMIC CHIP 0.01uF 10%	50V
				C505	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C506	1-163-234-11	CERAMIC CHIP 20PF 5%	50V
				C507	1-126-933-11	ELECT 100uF 20%	16V
				C510	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C511	1-163-005-11	CERAMIC CHIP 470PF 10%	50V



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< TERMINAL >		Q651	8-729-421-22	TRANSISTOR	UN2211-TX
EPT901	1-537-770-21	TERMINAL BOARD, GROUND		Q951	8-729-281-53	TRANSISTOR	2SC1815GR-TPE2
		< FERRITE BEAD/SHORT >				< RESISTOR >	
FB500	1-216-295-00	SHORT	0	R11	1-216-295-00	SHORT	0
FB501	1-216-295-00	SHORT	0	R12	1-216-295-00	SHORT	0
FB502	1-216-295-00	SHORT	0	R13	1-216-295-00	SHORT	0
FB681	1-414-235-22	INDUCTOR CHIP	OUH	R14	1-216-033-00	RES, CHIP	220 5% 1/10W
FB682	1-414-235-22	INDUCTOR CHIP	OUH	R15	1-216-033-00	RES, CHIP	220 5% 1/10W
		< IC >		R16	1-216-033-00	RES, CHIP	220 5% 1/10W
IC201	8-759-100-96	IC NJM4558M-T2		R201	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
IC301	8-759-100-96	IC NJM4558M-T2		R202	1-216-679-11	METAL CHIP	15K 0.5% 1/10W
IC401	8-759-584-26	IC AK4524-TP		R203	1-218-764-11	RES, CHIP	330K 5% 1/10W
IC402	8-759-708-05	IC NJM78L05A-T3		R204	1-216-619-11	METAL CHIP	47 0.5% 1/10W
IC403	8-759-100-96	IC NJM4558M-T2		R221	1-216-639-11	METAL CHIP	330 0.5% 1/10W
IC451	8-759-100-96	IC NJM4558M-T2		R222	1-216-647-11	METAL CHIP	680 0.5% 1/10W
IC501	8-759-644-36	IC M30625MGA-A50GP		R223	1-216-699-11	METAL CHIP	100K 0.5% 1/10W
IC502	8-759-822-09	IC LB1641		R224	1-216-655-11	METAL CHIP	1.5K 0.5% 1/10W
IC503	8-759-269-92	IC SN74HCU04ANSR		R225	1-216-655-11	METAL CHIP	1.5K 0.5% 1/10W
IC601	8-759-638-23	IC M30624MG-A10FP		R226	1-216-683-11	METAL CHIP	22K 0.5% 1/10W
IC602	8-759-481-19	IC LB1830M-S-TE-L		R227	1-216-683-11	METAL CHIP	22K 0.5% 1/10W
IC603	8-759-099-37	IC SN74HCT74ANSR		R228	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
IC604	8-759-269-92	IC SN74HCU04ANSR		R229	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
IC605	8-759-548-61	IC SN74LV08ANSR		R230	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
IC606	8-759-548-61	IC SN74LV08ANSR		R231	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
IC607	8-759-926-18	IC SN74HC157ANSR		R232	1-219-786-11	FUSIBLE	22 5% 1/4W
IC608	8-759-269-92	IC SN74HCU04ANSR		R233	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
IC609	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN)		R301	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
IC901	8-759-701-75	IC NJM7805FA		R302	1-216-679-11	METAL CHIP	15K 0.5% 1/10W
IC902	8-759-701-75	IC NJM7805FA		R303	1-218-764-11	RES, CHIP	330K 5% 1/10W
IC903	8-759-604-32	IC M5F7810L		R304	1-216-619-11	METAL CHIP	47 0.5% 1/10W
IC904	8-759-450-49	IC BA07T		R321	1-216-639-11	METAL CHIP	330 0.5% 1/10W
IC905	8-759-486-55	IC NJM2370U33-TE2		△R322	1-216-647-11	METAL CHIP	680 0.5% 1/10W F
IC906	8-759-481-02	IC M62016L		R323	1-216-699-11	METAL CHIP	100K 0.5% 1/10W
IC941	8-759-633-42	IC M5293L		R324	1-216-655-11	METAL CHIP	1.5K 0.5% 1/10W
		< JACK >		R325	1-216-655-11	METAL CHIP	1.5K 0.5% 1/10W
J401	1-784-429-11	JACK, PIN 4P (LINE (ANALOG) IN/OUT)		R326	1-216-683-11	METAL CHIP	22K 0.5% 1/10W
		< COIL >		R327	1-216-683-11	METAL CHIP	22K 0.5% 1/10W
L401	1-412-056-11	INDUCTOR CHIP	4.7uH	R328	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
L501	1-408-958-21	INDUCTOR	1uH	R329	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
L502	1-410-369-11	INDUCTOR	1uH	R330	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
L503	1-408-958-21	INDUCTOR	1uH	R331	1-216-675-11	METAL CHIP	10K 0.5% 1/10W
L504	1-408-958-21	INDUCTOR	1uH	△R332	1-219-786-11	FUSIBLE	22 5% 1/4W F
L652	1-410-377-31	INDUCTOR CHIP	4.7uH	R333	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
L653	1-412-056-11	INDUCTOR CHIP	4.7uH	R401	1-216-295-00	SHORT	0
L654	1-412-006-31	INDUCTOR CHIP	10uH (US, Canadian)	R402	1-216-017-91	RES, CHIP	47 5% 1/10W
		< TRANSISTOR >		R403	1-216-017-91	RES, CHIP	47 5% 1/10W
Q221	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX). SO	R404	1-216-017-91	RES, CHIP	47 5% 1/10W
Q321	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX). SO	R405	1-216-017-91	RES, CHIP	47 5% 1/10W
Q401	8-729-424-08	TRANSISTOR	UN2111-TX	R406	1-216-101-00	METAL CHIP	150K 5% 1/10W
Q451	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX). SO	R407	1-216-025-00	RES, CHIP	100 5% 1/10W
Q452	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX). SO	R408	1-216-025-00	RES, CHIP	100 5% 1/10W
Q501	8-729-421-19	TRANSISTOR	UN2213-TX	R409	1-216-025-00	RES, CHIP	100 5% 1/10W
				R451	1-216-619-11	METAL CHIP	47 0.5% 1/10W
				R452	1-216-619-11	METAL CHIP	47 0.5% 1/10W
				R453	1-216-619-11	METAL CHIP	47 0.5% 1/10W
				R454	1-216-619-11	METAL CHIP	47 0.5% 1/10W
				R455	1-216-057-00	METAL CHIP	2.2K 5% 1/10W

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以阴影和 △ 标志来识别的零部件, 在安全方面具有关键性. 因此只能以规定号码的零部件来更换.



MAIN	PWSW	SW	TRANS
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Ref. No.	Part No.	Description	Remark
R456	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R501	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R502	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R503	1-216-049-11	RES, CHIP	1K 5% 1/10W
R504	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R505	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R506	1-216-089-00	RES, CHIP	47K 5% 1/10W
R507	1-216-089-00	RES, CHIP	47K 5% 1/10W
R508	1-216-089-00	RES, CHIP	47K 5% 1/10W
R509	1-216-089-00	RES, CHIP	47K 5% 1/10W
R512	1-216-033-00	RES, CHIP	220 5% 1/10W
R513	1-216-049-11	RES, CHIP	1K 5% 1/10W
R601	1-216-065-00	RES, CHIP	4.7K 5% 1/10W
R602	1-216-089-00	RES, CHIP	47K 5% 1/10W
R603	1-216-073-00	METAL CHIP	10K 5% 1/10W
R604	1-216-073-00	METAL CHIP	10K 5% 1/10W
R605	1-216-073-00	METAL CHIP	10K 5% 1/10W
R606	1-216-073-00	METAL CHIP	10K 5% 1/10W
R607	1-216-073-00	METAL CHIP	10K 5% 1/10W
R608	1-216-073-00	METAL CHIP	10K 5% 1/10W
R609	1-216-073-00	METAL CHIP	10K 5% 1/10W
R610	1-216-073-00	METAL CHIP	10K 5% 1/10W
R611	1-216-073-00	METAL CHIP	10K 5% 1/10W
R612	1-216-073-00	METAL CHIP	10K 5% 1/10W
R613	1-216-073-00	METAL CHIP	10K 5% 1/10W
R621	1-216-073-00	METAL CHIP	10K 5% 1/10W
R623	1-216-073-00	METAL CHIP	10K 5% 1/10W
R624	1-216-073-00	METAL CHIP	10K 5% 1/10W
R625	1-216-089-00	RES, CHIP	47K 5% 1/10W
R651	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R652	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R653	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R654	1-216-049-00	RES, CHIP	1K 5% 1/10W
R654	1-249-417-11	CARBON	1K 5% 1/4W (EXCEPT US, Canadian) (US, Canadian)
R655	1-216-033-00	METAL CHIP	220 5% 1/10W
R656	1-216-121-00	RES, CHIP	1M 5% 1/10W
R657	1-216-121-00	RES, CHIP	1M 5% 1/10W
R658	1-247-815-91	CARBON	220 5% 1/4W (US, Canadian)
R660	1-216-295-00	SHORT	0
R681	1-216-113-00	METAL CHIP	470K 5% 1/10W
R682	1-216-049-11	RES, CHIP	1K 5% 1/10W
R683	1-216-089-00	RES, CHIP	47K 5% 1/10W
R684	1-216-109-00	METAL CHIP	330K 5% 1/10W
R685	1-216-089-00	RES, CHIP	47K 5% 1/10W
R688	1-216-033-00	METAL CHIP	220 5% 1/10W
R941	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R942	1-216-083-00	METAL CHIP	27K 5% 1/10W
R943	1-216-097-00	RES, CHIP	100K 5% 1/10W
R952	1-216-089-00	RES, CHIP	47K 5% 1/10W
R953	1-216-057-00	RES, CHIP	2.2K 5% 1/10W
R961	1-216-097-00	RES, CHIP	100K 5% 1/10W
R962	1-216-025-00	RES, CHIP	100 5% 1/10W
R963	1-216-073-00	METAL CHIP	10K 5% 1/10W
R981	1-216-025-00	RES, CHIP	100 5% 1/10W
R982	1-216-045-00	METAL CHIP	680 5% 1/10W

Ref. No.	Part No.	Description	Remark
R983	1-216-039-00	METAL CHIP	390 5% 1/10W
R984	1-216-073-00	METAL CHIP	10K 5% 1/10W
		< VIBRATOR >	
X501	1-781-174-21	VIBRATOR, CERAMIC (10MHz)	
X602	1-781-174-21	VIBRATOR, CERAMIC (10MHz)	
*****			
	1-674-747-11	PWSW BOARD	*****
*	3-362-478-01	HOLDER (T), LED	
		< CAPACITOR >	
C781	1-126-382-11	ELECT	100uF 20% 6.3V
C782	1-164-159-11	CERAMIC	0.1uF 50V
		< CONNECTOR >	
* CN703	1-691-746-11	CONNECTOR, BOARD TO BOARD 5P	
		< DIODE >	
D781	8-719-301-39	LED SEL2210S-D-TP (STANDBY)	
		< IC >	
IC781	8-749-013-91	IC GP1UC8X	
		< TRANSISTOR >	
Q781	8-729-900-80	TRANSISTOR	UN4211-TA
		< RESISTOR >	
R781	1-247-807-31	CARBON	100 5% 1/4W
R782	1-247-807-31	CARBON	100 5% 1/4W
R783	1-249-409-11	CARBON	220 5% 1/4W
		< SWITCH >	
S705	1-762-875-21	SWITCH, KEYBOARD (I/⌂)	
*****			
*	1-668-111-11	SW BOARD	*****
		< CONNECTOR >	
* CN601	1-506-486-11	PIN, CONNECTOR 7P	
		< SWITCH >	
S601	1-572-126-21	SWITCH, PUSH (1 KEY) (REC POSITION)	
S602	1-572-126-21	SWITCH, PUSH (1 KEY) (PACK OUT)	
S604	1-771-264-11	SWITCH, PUSH (DETECTION)	(PLAY POSITION)
*****			
	1-674-745-11	TRANS BOARD	*****
		< DIODE >	
△D101	8-719-200-02	DIODE 11E2-TB2	

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< CONNECTOR >		#3	7-621-772-20	SCREW +B 2X5	
* CN103	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P		#4	7-621-772-40	SCREW +B 2X8	
		< RELAY >		#5	7-627-852-08	SCREW, PRECISION +P 1.7X2.5	
△ RY101	1-755-365-11	RELAY		#6	7-685-533-19	SCREW, +BTP 2.6X6 TYPE2 N-S	
		< SWITCH >		#7	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
△ S101	1-771-474-11	SWITCH, POWER (VOLTAGE CHANGE) (VOLTAGE SELECTOR) (Singapore)		#8	7-621-775-10	SCREW +B 2.6X4	
		<TRANSFOMER>		*****			
△ TR101	1-433-702-11	TRANSFORMER, POWER (US, Canadian)		ACCESSORIES & PACKING MATERIALS			
△ TR101	1-433-703-11	TRANSFORMER, POWER (AEP, UK, Chinese)		*****			
△ TR101	1-433-704-11	TRANSFORMER, POWER (Singapore)		1-418-507-11		REMOTE COMMANDER (RM-D37M)	
△ TR102	1-435-083-11	TRANSFORMER, POWER (AEP, UK, Chinese)		1-558-271-11		CORD, CONNECTION (AUDIO)	
△ TR102	1-435-084-11	TRANSFORMER, POWER (US, Canadian)		1-574-264-11		CORD, OPTICAL PLUG	
				3-867-092-11		MANUAL, INSTRUCTION (ENGLISH) (US, Canadian, AEP, UK, Singapore, Chinese)	
△ TR102	1-435-085-11	TRANSFORMER, POWER (Singapore)		3-867-092-21		MANUAL, INSTRUCTION (FRENCH) (Canadian, AEP, Singapore)	
*****				3-867-092-31		MANUAL, INSTRUCTION (SPANISH, PORTUGUESE) (AEP, Singapore)	
		MISCELLANEOUS		3-867-092-41		MANUAL, INSTRUCTION (GERMAN, DUTCH) (AEP)	
		*****		3-867-092-51		MANUAL, INSTRUCTION (SWEDISH, ITALIAN) (AEP)	
2	1-783-140-11	WIRE (FLAT TYPE) (23 CORE)		3-867-092-61		MANUAL, INSTRUCTION (CHINESE) (Singapore, Chinese)	
3	1-791-163-11	WIRE (FLAT TYPE) (27 CORE)		4-981-643-01		COVER, BATTERY (for RM-D37M)	
5	1-791-165-12	WIRE (FLAT TYPE) (29 CORE)					
8	1-791-164-11	WIRE (FLAT TYPE) (19 CORE)					
106	1-569-972-21	SOCKET, SHORT 2P					
△ 110	1-751-275-11	CORD, POWER (AEP, UK, Singapore)					
△ 110	1-783-531-41	CORD, POWER (US, Canadian)					
△ 110	1-782-464-21	CORD, POWER (Chinese)					
△ 111	1-569-008-21	ADAPTOR, CONVERSION 2P (Singapore)					
△ 111	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)					
112	1-500-386-11	FILTER, CLAMP (FERRITE CORE)					
113	1-543-798-11	FILTER, CLAMP (FERRITE CORE) (US, Canadian)					
258	1-667-954-11	FLEXIBLE BOARD					
△ 260	8-583-056-01	OPTICAL PICK-UP KMS-262A/J1N					
△ 351	8-820-113-01	OPTICAL PICK-UP KSS-213BH/Z-NP					
352	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)					
HR901	1-500-502-11	HEAD, OVER WRITE					
M101	X-4952-658-1	MOTOR ASSY (SPINDLE) (CD)					
M102	X-4917-504-1	MOTOR ASSY (SLED) (CD)					
M103	A-4604-363-A	MOTOR (L) ASSY (LOADING) (CD)					
M201	A-4672-855-A	MOTOR ASSY, SPINDLE (MD)					
M202	A-4672-474-A	MOTOR ASSY, SLED (MD)					
M203	X-4949-264-1	MOTOR ASSY, LOADING (MD)					
S102	1-762-148-21	SWITCH, PUSH (2 KEY) (REFLECT DET, PROTECT DET)					
△ TR102	1-435-083-11	TRANSFORMER, POWER (AEP, UK, Chinese)					
△ TR102	1-435-084-11	TRANSFORMER, POWER (US, Canadian)					
△ TR102	1-435-085-11	TRANSFORMER, POWER (Singapore)					
*****							
		*****					
		HARDWARE LIST					
		*****					
#1	7-685-871-01	SCREW +BVTT 3X6 (S)					
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT (B)					

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