MDS-S9

SERVICE MANUAL

AEP Model
UK Model

Ver 1.0 2001.06

Self Diagnosis Supported model

US and foreign patents licensed from Dolby Laboratories.

Model Name Using Similar Mechanism	MDS-S50
MD Mechanism Type	MDM-7A
Optical Pick-up Name	KMS-260B

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser (λ = 780 nm) Emission duration: continuous
Laser output	MAX 44.6 μW[1)]

1) 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.

Laser diode	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	ACIRC (Advanced Cross Interleave Reed Solomon Code)
Sampling frequency	44.1 kHz
Coding	ATRAC (Adaptive TRansform Acoustic Coding)/ATRAC 3
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz ±0.3 dB
Signal-to-noise ratio	Over 96 dB during play
Wow and flutter	Below measurable limit

Inputs

ANALOG IN	Jack type: phono Impedance: 47 kilohms Rated input: 500 mVrms Minimum input: 125 mVrms
DIGITAL IN	Connector type: square optical Impedance: 660 nm (optical wave length)

Outputs

ANALOG OUT	Jack type: phono Rated output: 2 Vrms (at 50 kilohms) Load impedance: over 10 kilohms

General

Power requirements	230 V AC, 50/60Hz
Power consumption	15 W 0.5 W (at the STANDBY mode)
Dimensions (approx.)	280 × 83 × 290 mm (w/h/d) incl. projecting parts and controls
Mass (approx.)	2.4 kg

Supplied accessories

Audio connecting cords (2)
Optical cable (1)
Remote commander (remote) (1)
R6 (size-AA) batteries (2)

Design and specifications are subject to change without notice.

MINIDISC DECK

9-873-914-11
2001F0500-1

Sony Corporation
Home Audio Company
Shinagawa Tec Service Manual Production Group

SONY

SELF-DIAGNOSIS FUNCTION

The deck's self-diagnosis function automatically checks the condition of the MD deck when an error occurs, then issues a three- or five-digit code and an error message on the display. If the code and message alternate, find them in the following table and perform the indicated countermeasure. Should the problem persist, consult your nearest Sony dealer.

C11/Protected

➡ Take out the MD and close the record-protect slot.

C12/Cannot Copy

- You tried to record a CD with a format that the external device connected to the deck does not support, such as CD-ROM or video CD.
  ➡ Remove the disc and insert a music CD.

C13/REC Error

➡ Set the deck in a stable surface, and repeat the recording procedure.

- The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or substandard in quality.
  ➡ Replace the disc and repeat the recording procedure.

C13/Read Error

➡ Take out the MD and insert it again.

C14/TOC Error

➡ Insert another disc.
➡ If possible, erase all the tracks on the MD.

C41/Cannot Copy

- The sound source is a copy of commercially available music software, or you tried to record a CD-R (Recordable CD).
  ➡ The Serial Copy Management System prevents making a digital copy. You cannot record a CD-R.

C71/Din Unlock

- The sporadic appearance of this message is caused by the digital signal being recorded. This will not affect the recording.
- While recording from a digital component connected through the DIGITAL 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 release the mode.

1. While pressing the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously, connect the power plug to the outlet, and release the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously to display "[Check]".
2. Turn the [I◀◀ AMS ▶▶I] knob and when "[Service]" is displayed, press the [YES] button to display "AUTO CHECK" (C01).
3. Turn the [I◀◀ AMS ▶▶I] knob to display "Err Display" (C02).
4. Press the [YES] button to sets the error history mode and displays "op rec tm".
5. Select the contents to be displayed or executed using the [I◀◀ AMS ▶▶I] knob.
6. Press the [I◀◀ AMS ▶▶I] knob to display or execute the contents selected.
7. Press the [I◀◀ AMS ▶▶I] knob another time returns to step 4.
8. Press the [MENU/NO] button to display "Err Display" (C02) and release the error history mode.
9. To release the test mode, press the [I/⏻] button. The unit sets into the STANDBY state, and the test mode ends.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Display	Details of History
op rec tm	Cumulative recording time is displayed. When cumulative recording time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, “Under 1 min” is displayed. 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.
op play tm	Cumulative playing time is displayed. When cumulative playing time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, “Under 1 min” is displayed. The displayed time is the total of the actual play time. Pauses are not counted. The time is displayed in decimal digits.
spdl rp tm	Cumulative spindle motor running time is displayed. When cumulative spindle motor run time is over 1 minute, the hour and minute are displayed as they are. When it is under 1 minute, “Under 1 min” is displayed. The time is displayed in decimal digits.
retry err	Displays the total number of retries during recording and number of retry errors during playback. Displayed as “r ☐☐ p ☐☐”. “r” indicates the retries during recording while “p” indicates the retry errors during playback. 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☐ ErrCd @@”. ☐ 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 I◀◀ AMS ▶▶I knob.
retry adrs	Display the 5 latest retry address. Display as “☐☐ ADRS@@@@”. ☐☐ indicates the history number. The smaller the number, the more recent is the error. (00 is the latest) @@@@ indicates the cluster of retry address. The number of retry address can be switched by turning the I◀◀ AMS ▶▶I knob.
er refresh	Mode to clear the error history and retry address history. **Procedure:** 1) Press the I◀◀ AMS ▶▶I button. 2) The display will change to “er refresh?”, and then press the YES button. The operation is over if “Complete!” is displayed. After this mode was executed, check the following: • The data have been cleared. • Perform the recording and playing to check that the mechanism operates normally.
op change	Mode to clear cumulative time of “op rec tm” and “op play tm”. These historical data are used to determine the timing when the optical pick-up is to be replaced. When the optical pick-up was replaced, perform this operation to clear historical data. **Procedure:** 1) Press the I◀◀ AMS ▶▶I button. 2) The display will change to “op chang?”, and then press the YES button. The operation is over if “Complete!” is displayed.
spdl change	Mode to clear cumulative time of “spdl rp tm”. This historical data is used to determine the timing when the spindle motor is to be replaced. When the spindle motor was replaced, perform this operation to clear historical data. **Procedure:** 1) Press the I◀◀ AMS ▶▶I button. 2) The display will change to “spdl chang?”, and then press the YES button. The operation is over if “Complete!” is displayed.

Table of Error Codes

Error Code	Details of Error
10	Loading failed
12	Loading switch combination is illegal
20	Head of PTOC could not be read within the specified time
21	Head of PTOC could be read but its content is erroneous
22	Access to UTOC could not be made within the specified time
23	UTOC could be not read within the specified time
24	Content of UTOC is erroneous
30	Playing could not start
31	Content of sector is erroneous
40	Cause of retry occurred during normal recording
41	D-RAM overflowed and retry was executed
42	Retry was executed during the writing to TOC
43	S.F editing was interrupted by retry
50	Address could not be read except in access processing
51	Focusing failed and it is out of control
60	Unlock retry

TABLE OF CONTENTS

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.

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.

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

Eksplosjonsfare 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.

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

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

The following caution label is located inside the unit.

SAFETY-RELATED COMPONENT WARNING!!

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

SECTION 1
SERVICING NOTES

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

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

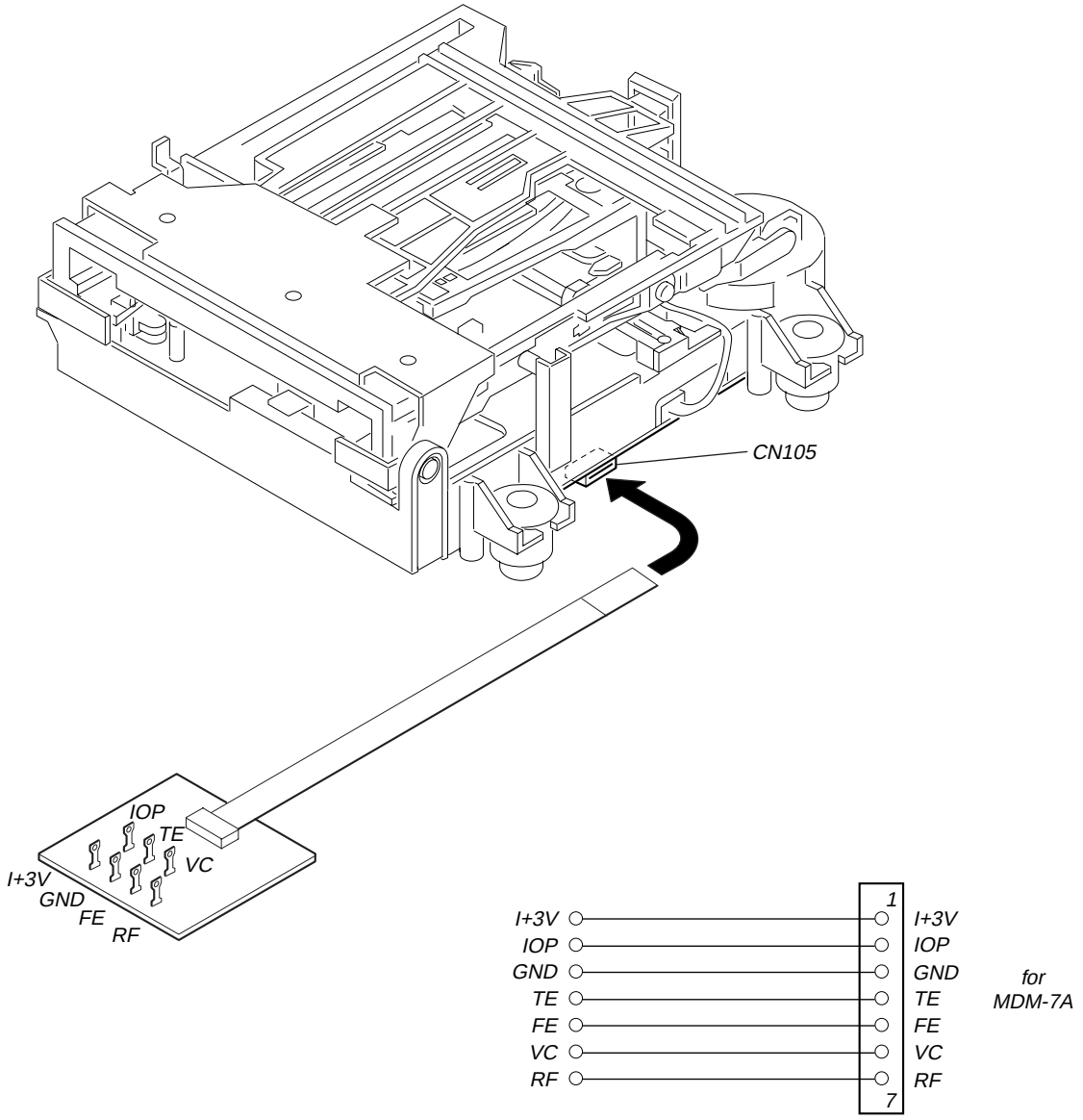
NOTES ON LASER DIODE EMISSION CHECK

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

JIG FOR CHECKING BD BOARD WAVEFORM

The special jig (J-2501-196-A) is useful for checking the waveform of the BD board. The names of terminals and the checking items to be performed are shown as follows.

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)
GND : Ground
TE : Tracking error signal (Traverse adjustment)
FE : Focus error signal
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 (IC195 OF BD 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 label of the optical pick-up. When replacing the optical pick-up or non-volatile memory (IC195 of BD board), record the IOP value on the optical pick-up according to the following procedure.

Record Precedure:

1. While pressing the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously, connect the power plug to the outlet, and release the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously to display "[Check]".
2. Turn the [I◀◀ AMS ▶▶I] knob to display "[Service]", and press the [YES] button to display "AUTO CHECK" (C01).
3. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop Write" (C05), and press the [YES] button.
4. The display becomes "Ref=@@@.@" (@ is an arbitrary number) and the numbers which can be changed will blink.
5. Input the IOP value written on the optical pick-up.
   To select the number : Turn the [I◀◀ AMS ▶▶I] knob.
   To select the digit : Press the [I◀◀ AMS ▶▶I] knob.
6. When the [YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
7. As the adjustment results are recorded for the 6 value. Leave it as it is and press the [YES] button.
8. "Complete!!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write" (C05).
9. Press the [I/⏻] button to complete.

Display Precedure:

1. While pressing the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously, connect the power plug to the outlet, and release the [I◀◀ AMS ▶▶I] knob and [■] button simultaneously to display "[Check]".
2. Turn the [I◀◀ AMS ▶▶I] knob to display "[Service]", and press the [YES] button to display "AUTO CHECK" (C01).
3. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop Read" (C26), and press the [YES] button.
4. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ : indicates the IOP value labeled on the optical pick-up.
   ##.# : indicates the IOP value after adjustment
5. To end, press the [I◀◀ AMS ▶▶I] knob or [MENU/NO] button to display "Iop Read" (C26). Then press the [I/⏻] button.

WHEN MEMORY NG IS DISPLAYED

If the nonvolatile memory data is abnormal, "E001 MEMORY NG" will be displayed so that the MD deck does not continue operations. In this case, set the test mode promptly and perform the following procedure.

Procedure:

1. Enter the test mode (refer to page 15).
2. Normally a message for selecting the test mode will be displayed. However if the nonvolatile memory is abnormal, the following will be displayed "INIT EEP?".
3. Press the both [■] and [⏏] buttons simultaneously.
4. Turn the [I◀◀ AMS ▶▶I] knob to display "MDM-7A".
5. Press the [I◀◀ AMS ▶▶I] button. If the nonvolatile memory is successfully overwritten, the normal test mode will be set and a message to select the test mode will be displayed.

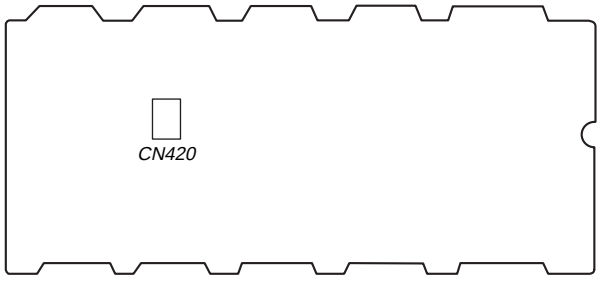
FORCE RESET

You can reset the microprocessor of the system with following procedure.
Use this method if the device cannot be operated normaly because the microprocessor is hung up or with some reasons.

Procedure:

Remove the short pin attached on CN420, then install it again.

– MAIN BOARD (Component Side) –



RETRY CAUSE DISPLAY MODE IN MD

- In this test mode, the causes for retry of the unit during recording and stop can be displayed on the liquid crystal display. 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.

Precedure:

1. Keep the ■ button pressed for about 10 seconds, or press the [LEVER/DISPLAY/CHAR] button while pressing ■ and [MENU/NO] buttons.
2. "RTs00c00e000" is displayed after the mode is set.
3. Press the ● button go into recording mode, then press the [▶II] button to start recording.
4. To check "track mode", press the [▶II] button to playback.
5. To release the test mode, press the [I/⏻] button and turn off the power. Remove the power plug from the outlet after "TOC" is turned off. If you cannot release the test mode, refer to "FORCE RESET" on page 7.

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

[RTs@@c##e***]
Liquid crystal display

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

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

[@@ ###** $$]
Liquid crystal display

@@ : Parts No. (Name of area named on TOC)
: Cluster } Address (Physical address on the
** : Sector } disc)
$$: Track mode (Track information such as copyright information of each part)

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
Hexadecimal	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

	Higher Bits				Lower Bits				Hexa-decimal	Details	
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0		When 0	When 1
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.	
	0	0	0	0	1	0	0	0	08	01: Normal audio. Others: Invalid	
	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”, and “Write allowed”.

Example When 07 is displayed:
Higher bit: 0 = 0000 ⟶ 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”, and “Write prohibited”.

Hexadecimal ⟶ Binary Conversion Table

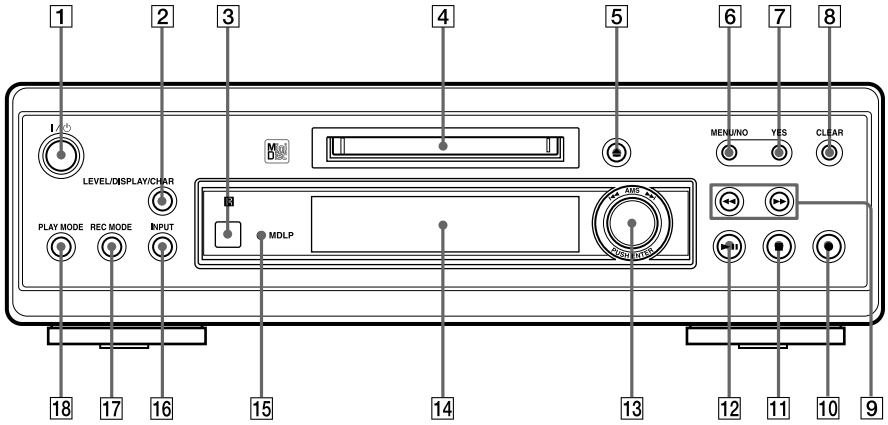
Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

SECTION 2
GENERAL

This section is extracted from instruction manual.

LOCATION OF CONTROLS

– Front Panel –

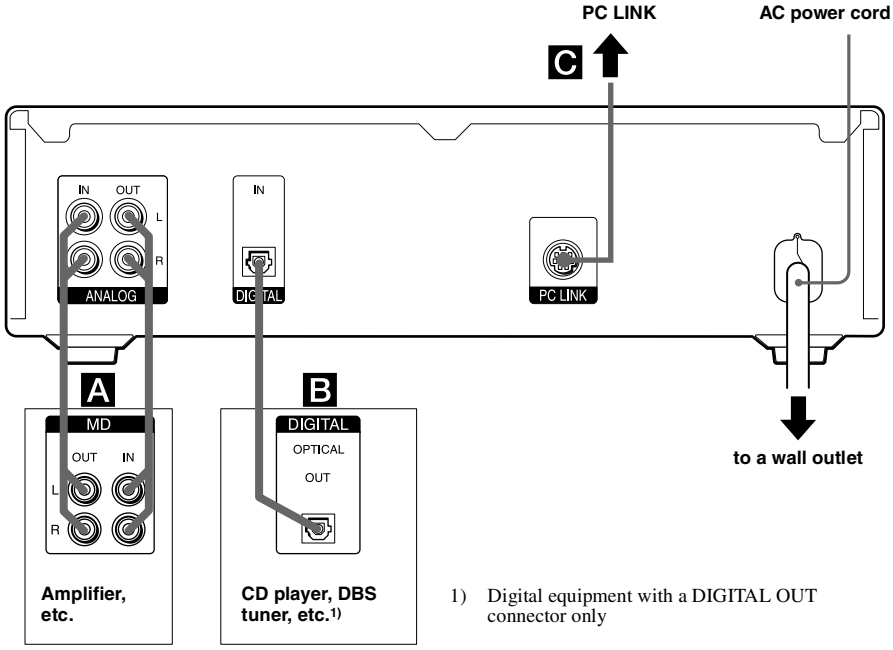


AMS 13 (8) (10) (12) (13) (16) (24)
CLEAR 8 (7) (16) (18) (24)
Display 14 (8) (17)
INPUT 16 (8)
LEVEL/DISPLAY/CHAR 2 (8) (12) (24)
MD insertion slot 4 (16)
MD LP indicator 15 (10) (17)
MENU/NO 6 (10) (18) (20)
PLAY MODE 18 (16)
REC MODE 17 (9)
Remote sensor 3 (7)
YES 7 (10) (18) (20)

BUTTON DESCRIPTIONS

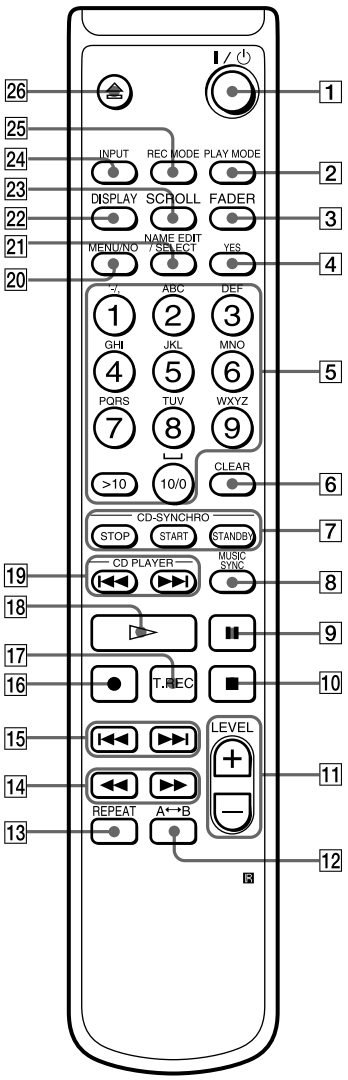
I/⏻ (power)/STANDBY indicator 1 (8) (16)
⏏ (eject) 5 (8) (17)
◀◀ (go back)/▶▶ (go forward) 9 (16) (17) (18) (24)
● (recording) 10 (8) (10)
■ (stop) 11 (7) (8) (16)
►II (play/pause) 12 (8) (16)

– Back Panel –



1) Digital equipment with a DIGITAL OUT connector only

Remote control



A↔B 12 (16)
CD PLAYER I◀◀ (go back)/▶▶I (go forward) 19 (15)
CD-SYNCHRO STANDBY/START/STOP 7 (14) (15)
CLEAR 6 (16) (18) (24)
DISPLAY 22 (8) (12)
FADER 3 (28)
INPUT 24 (8)
Letter/number buttons 5 (17) (25)
LEVEL +/– 11 (12)
MENU/NO 20 (10) (18) (20)
MUSIC SYNC 8 (14)
NAME EDIT/SELECT 21 (24)
PLAY MODE 2 (16)
REC MODE 25 (9)
REPEAT 13 (16)
SCROLL 23 (17)
T.REC 17 (13)
YES 4 (10) (18) (20)

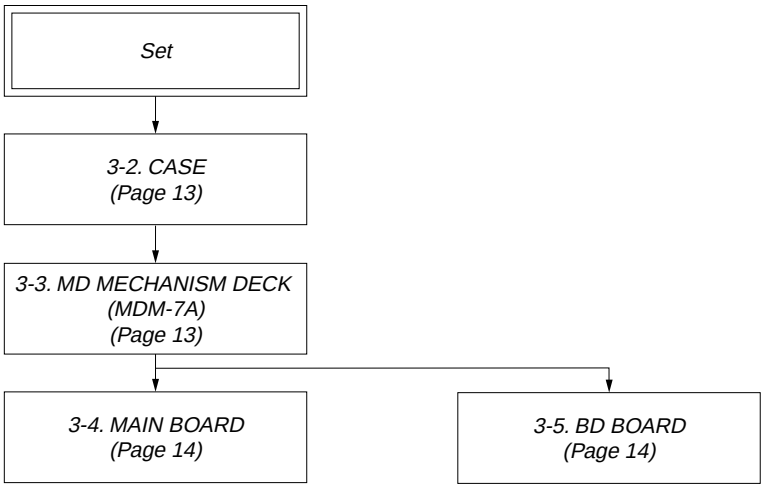
BUTTON DESCRIPTIONS

I/⏻ (power) 1 (8) (16)
▮▮ (pause) 9 (8) (16)
■ (stop) 10 (8) (16)
◀◀ (fast reverse)/▶▶ (fast forward) 14 (16) (17) (18) (24)
I◀◀ (go back)/▶▶I (go forward) 15 (8) (10) (16) (17) (25) (26)
● (recording) 16 (8) (10)
▷ (play) 18 (8) (16)
⏏ (eject) 26 (8) (17)

SECTION 3
DISASSEMBLY

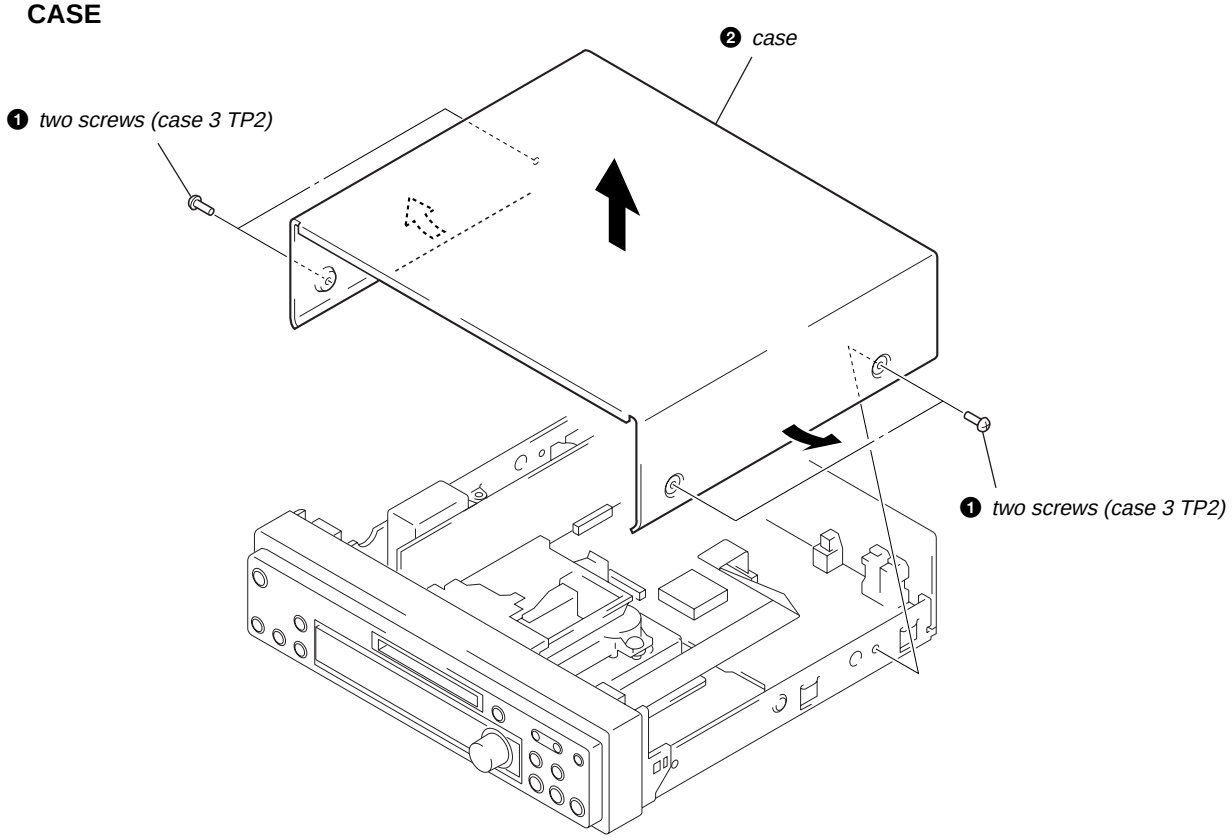
• This set can be disassembled in the order shown below.

3-1. DISASSEMBLY FLOW

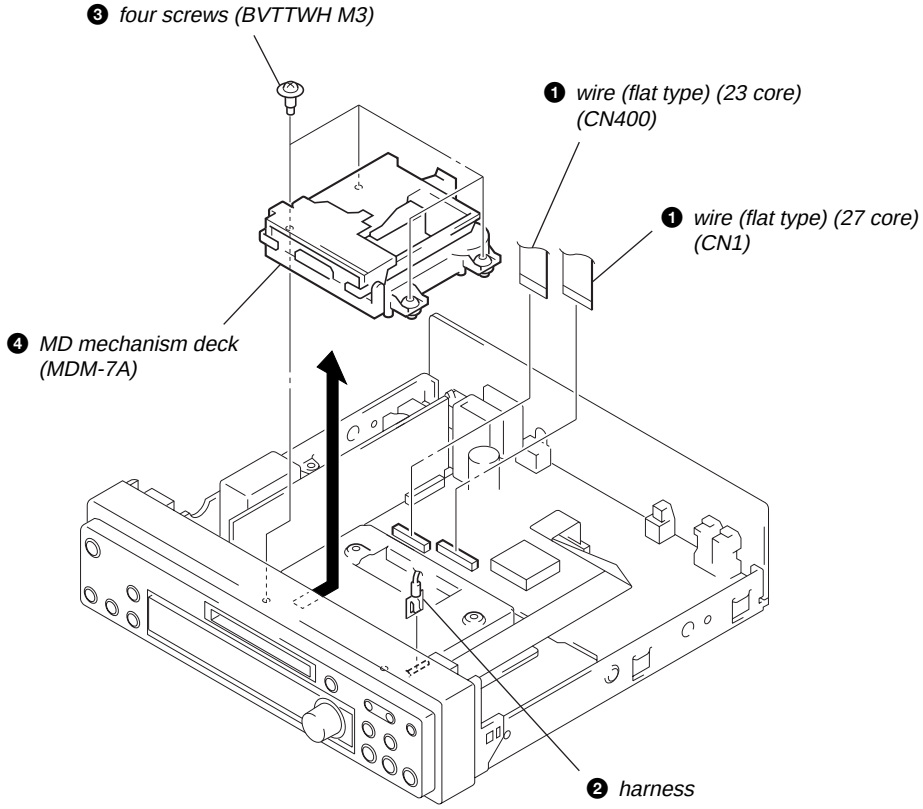


Note: Follow the disassembly procedure in the numerical order given.

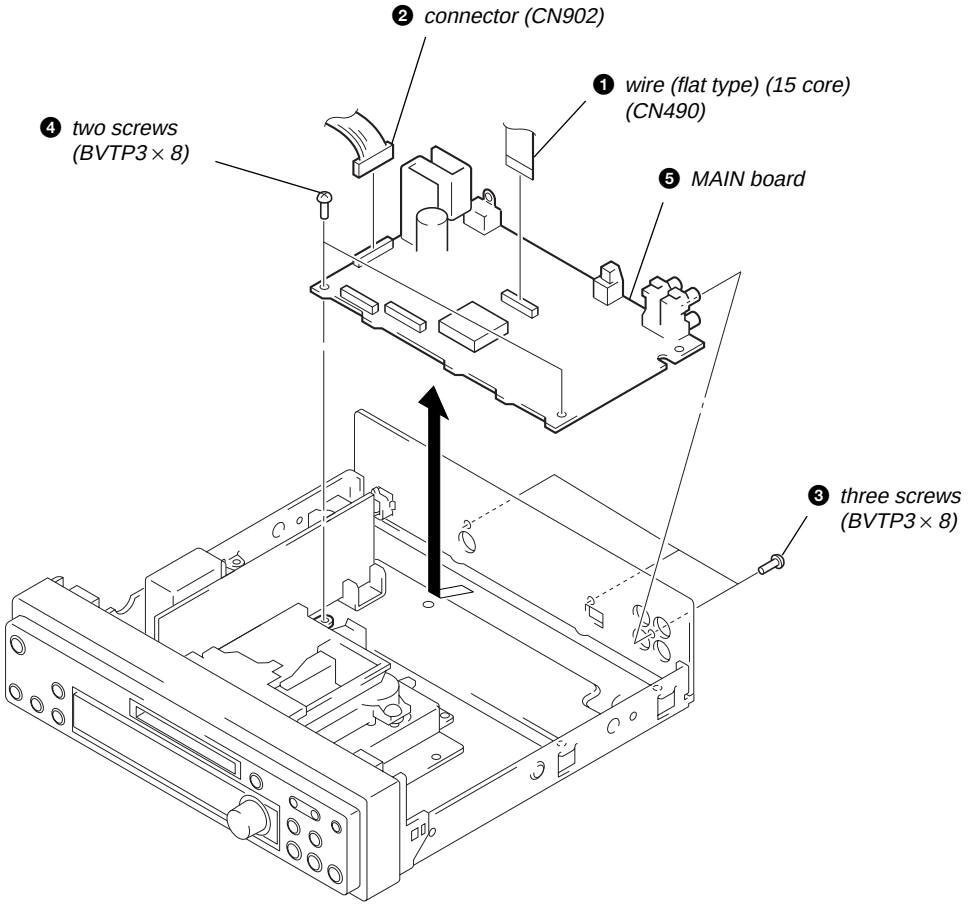
3-2. CASE



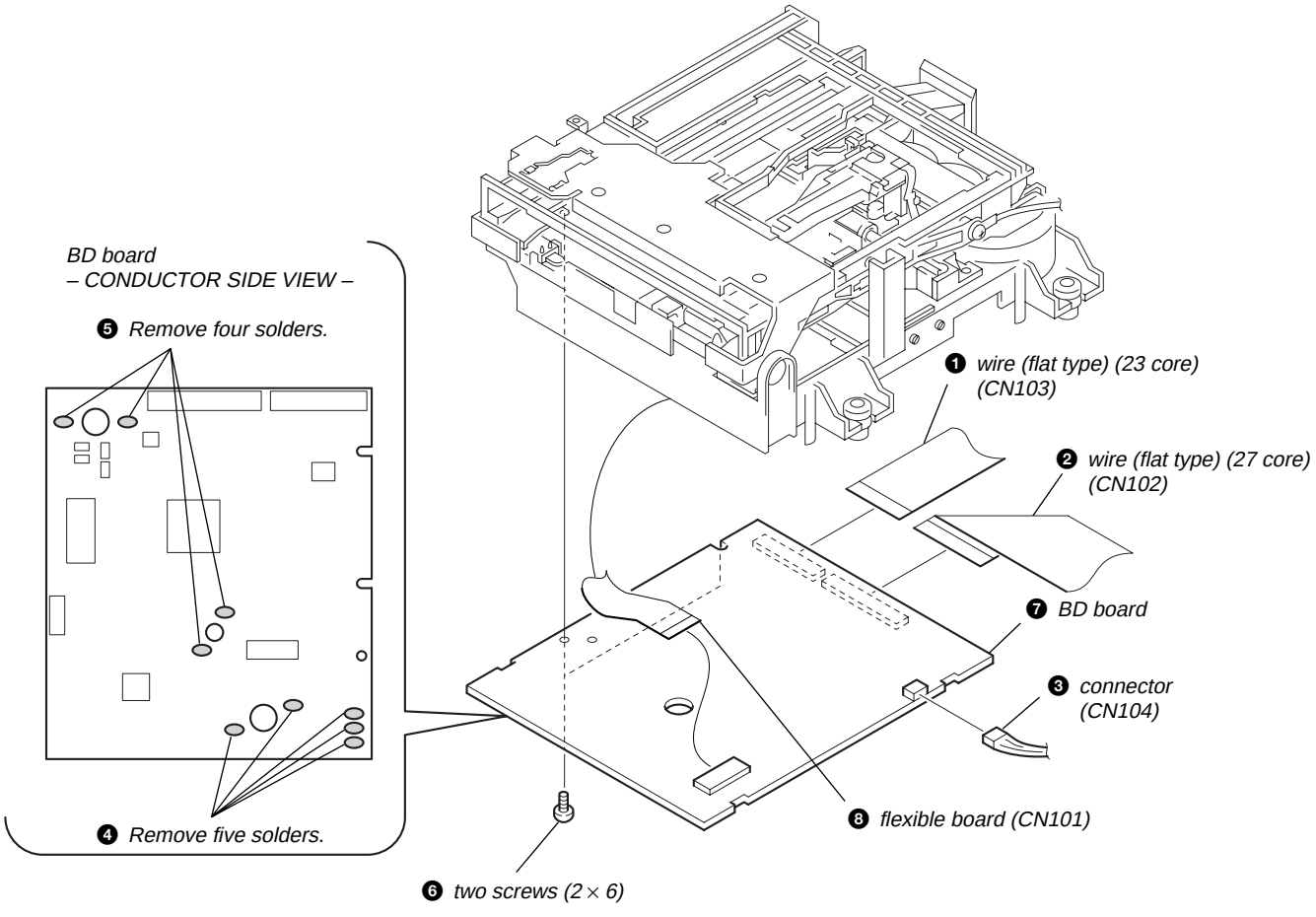
3-3. MD MECHANISM DECK (MDM-7A)



3-4. MAIN BOARD



3-5. BD BOARD



SECTION 4
TEST MODE

4-1. 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 ⏏ 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 ⏏ button after pressing the MENU/NO button and the rotation of disc is stopped.

4-1-1. Recording laser emission mode and operating buttons

- Continuous recording mode (CREC 1MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUST)
- Comparison with initial Iop value written in nonvolatile memory (Iop Compare)
- Write current Iop value in read nonvolatile memory using microprocessor (Iop NV Save)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUST)
- When pressing the ● button.

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: While pressing the I◀◀ AMS ▶▶I knob and ■ button simultaneously, connect the power plug to the outlet, and release the I◀◀ AMS ▶▶I knob and ■ button.
When the test mode is set, "[Check]" will be displayed. Turning the I◀◀ AMS ▶▶I knob between the following three groups; ‥ ⟷ [Check] ⟷ [Service] ⟷ [Develop] ⟷ ‥:

Procedure 2: While pressing the I◀◀ AMS ▶▶I knob, connect the power plug to the outlet, and release the I◀◀ AMS ▶▶I knob.
When the test mode is set, "TEMP CHECK" (C12) will be displayed. By setting the test mode using this method, only the "Check" group of procedure1 can be executed.

Note: Do not use the test mode in the [Develop] group.
If used, the unit may not operate normally.
If the [Develop] group is set accidentally, press the MENU/NO button immediately to release the [Develop] group.

4-3. RELEASING THE TEST MODE

Press the I/⏻ button. The unit sets into the STANDBY state, and the test mode ends.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the I◀◀ AMS ▶▶I knob, YES button, and MENU/NO button.
The functions of knob and buttons are as follows.

Function name	Function
I◀◀ AMS ▶▶I knob	Changes parameters and modes
YES button	Proceeds onto the next step. Finalizes input
MENU/NO button	Returns to previous step. Stops operations

4-5. SELECTING THE TEST MODE

There are 26 types of test modes as shown below. The groups can be switched by turning the I◀◀ AMS ▶▶I knob. After selecting the group to be used, press the YES button. After setting a certain group, turning the I◀◀ AMS ▶▶I knob switches modes shown below. Refer to “Group” in the table for details can be selected.
All items used for servicing can be treated using group [Service]. So be carefully not to enter other groups by mistake.

Note: Do not use the test mode in the [Develop] group.
If used, the unit may not operate normally.
If the [Develop] group is set accidentally, press the MENU/NO button immediately to exit the [Develop] group.

Display	No.	Details	Mark	Group	
				Check	Service
AUTO CHECK	C01	Automatic self-diagnosis			○
Err Display	C02	Error history display, clear			○
TEMP ADJUST	C03	Temperature compensation offset adjustment			○
LDPWR ADJUST	C04	Laser power adjustment			○
Iop Write	C05	Iop data writing			○
Iop NV Save	C06	Writes current Iop value in read nonvolatile memory using microprocessor			○
EF MO ADJUST	C07	Traverse (MO) adjustment			○
EF CD ADJUST	C08	Traverse (CD) adjustment			○
FBIAS ADJUST	C09	Focus bias adjustment			○
AG Set (MO)	C10	Auto gain output level adjustment (MO)			○
AG Set (CD)	C11	Auto gain output level adjustment (CD)			○
TEMP CHECK	C12	Temperature compensation offset check		○	○
LDPWR CHECK	C13	Laser power check		○	○
EF MO CHECK	C14	Traverse (MO) check		○	○
EF CD CHECK	C15	Traverse (CD) check		○	○
FBIAS CHECK	C16	Focus bias check		○	○
ScurveCHECK	C17	S-curve check	×	○	
VERIFYMODE	C18	Nonvolatile memory check	×	○	
DETRK CHECK	C19	Detrack check	×	○	
0920 CHECK	C25	Most circumference check	×	○	
Iop Read	C26	Iop data display		○	○
Iop Compare	C27	Comparison with initial Iop value written in nonvolatile memory		○	○
ADJ CLEAR	C28	Initialization of nonvolatile memory for adjustment values			○
INFORMATION	C31	Display of microprocessor version, etc.		○	○
CPLAY1MODE	C34	Continuous playback mode		○	○
CREC 1MODE	C35	Continuous recording mode		○	○

- For details of each adjustment mode, refer to “5. Electrical Adjustments”.
  For details of “Err Display”, 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 (×) 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.

4-5-1. 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 [I◄◄ AMS ►►I] knob to display "CPLAY1MODE" (C34).
(3) Press the [YES] button to change the display to "CPLAY1MID".
(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.

"CPLAY1MID" → "CPLAY1OUT" → "CPLAY1IN"

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 "CPLAY1MODE" (C34).
(2) Press the [⏏] 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

4-5-2. Operating the Continuous Recording Mode (Use only when performing self-recording/palyback check)

1. Entering the continuous recording mode

(1) Set a recordable disc in the unit.
(2) Turn the [I◄◄ AMS ►►I] knob to display "CREC 1MODE" (C35).
(3) Press the [YES] button to change the display to "CREC 1MID".
(4) When access completes, the display changes to "CREC 1(□□□□)" 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.

"CREC 1MID" → "CREC 1OUT" → "CREC 1IN"

When pressed another time, the parts to be recorded can be changed. "**REC**" goes off.
(2) When access completes, the display changes to "CREC 1(□□□□)" 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 1MODE" (C35) and "**REC**" goes off.
(2) Press the [⏏] 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.

4-6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
►II	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF
■	Stops continuous playback and continuous recording
►►	The sled moves to the outer circumference only when this is pressed
◄◄	The sled moves to the inner circumference only when this is pressed
REC MODE	Switches between the pit and groove modes when pressed
PLAY MODE	Switches the spindle servo mode (CLV S ⟷ CLV A)
LEVEL/DISPLAY/CHAR	Switches the displayed contents each time the button is pressed
⏏	Ejects the disc
I/⏻	Releases the test mode

4-7. TEST MODE DISPLAYS

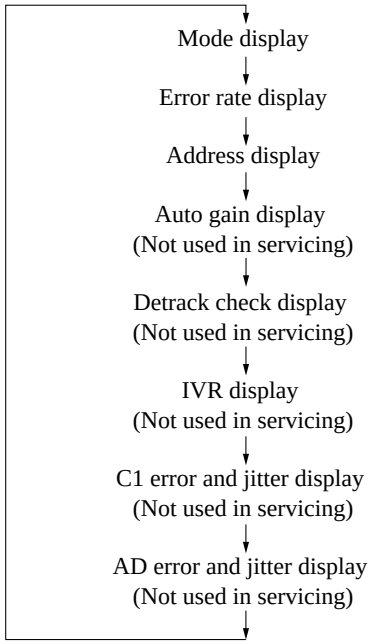
Each time the LEVEL/DISPLAY/CHAR button is pressed, the display changes in the following order.
When CPLAY or CREC are started, the display will forcibly be switched to the error rate display as the initial mode.

1. Mode display
Displays “TEMP ADJUST” (C03), “CPLAY1MODE” (C34), 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)
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 the address cannot be read.



MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
►	Servo ON	Servo 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
B/1	Tracking auto gain OK	
A-/REP	Focus auto gain OK	
TRACK/LP4	Pit	Groove
DISC/LP2	High reflection	Low reflection
SHUF/SLEEP	CLV S	CLV A
MONO	CLV LOCK	CLV UNLOCK

4-8. AUTOMATIC SELF-DIAGNOSIS FUNCTION

This test mode performs CREC and CPLAY automatically for mainly checking the characteristics of the optical pick-up.
To perform this test mode, the laser power must first be checked.
Perform AUTO CHECK after the laser power check and Iop Compare.

Procedure:

1. Turn the [I◀◀ AMS ▶▶I] knob to display “AUTO CHECK” (C01).
2. Press the [YES] button. If “LDPWR ミチェック ” is displayed, it means that the laser power check has not been performed. In this case, perform the laser power check and Iop Compare, and then repeat from enter the test mode.
3. If a disc is in the mechanical deck, it will be ejected forcibly.
   “DISC IN” will be displayed in this case. Load a test disc (MDW-74/GA-1) which can be recorded.
4. If a disc is loaded at step 3, the check will start automatically.
5. When “XX CHECK” is displayed, the item corresponding to XX will be performed.
   When “06 CHECK” completes, the disc loaded at step 3 will be ejected. “DISC IN” will be displayed. Load the check disc (TDYS-1).
6. When the disc is loaded in step 5, the check will automatically be resumed from “07 CHECK”.
7. After completing to test item 12, check OK or NG will be displayed. If all items are OK, “CHECK ALL OK” will be displayed. If any item is NG, it will be displayed as “NG:xxxx”.

When “CHECK ALL OK” is displayed, it means that the optical pick-up is normal. Check the operations of other parts (spindle motor, sled motor, etc.).
When displayed as “NG:xxxx”, it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

4-9. INFORMATION

Display the software version.

Procedure:

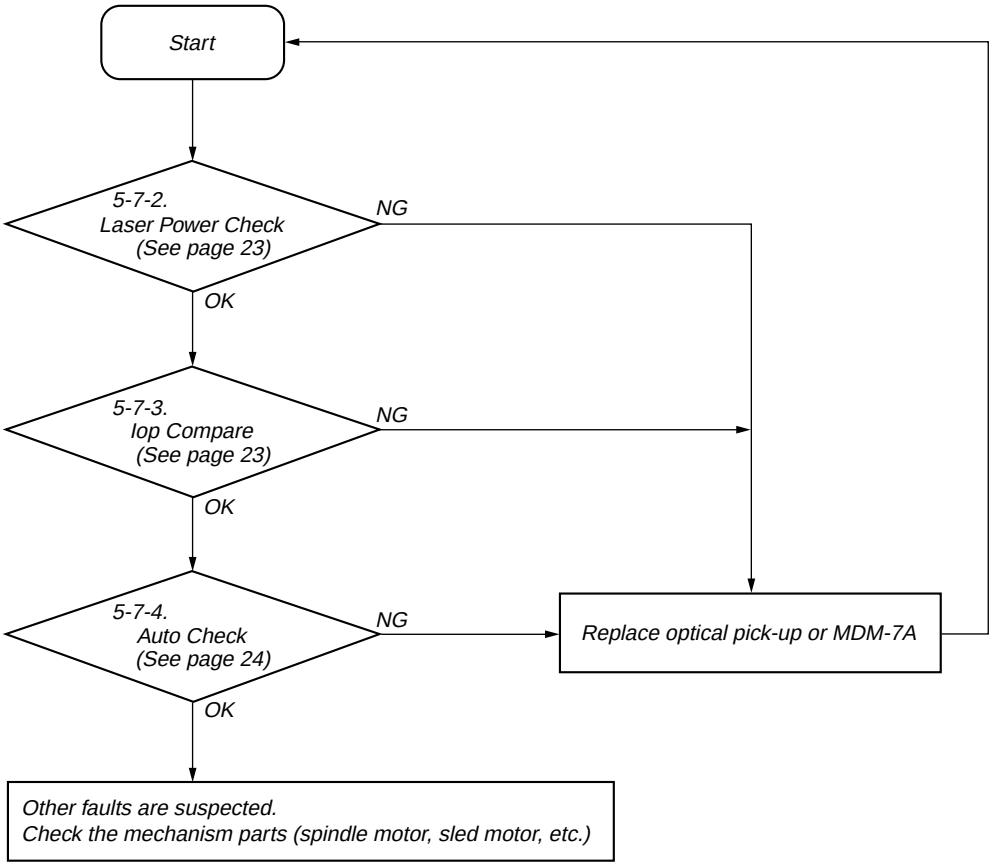
1. Turn the [I◀◀ AMS ▶▶I] knob to display “INFORMATION” (C31).
2. Press the [YES] button.
3. The software version will be displayed.
4. Press the [MENU/NO] button to end this mode.

SECTION 5
ELECTRICAL ADJUSTMENTS

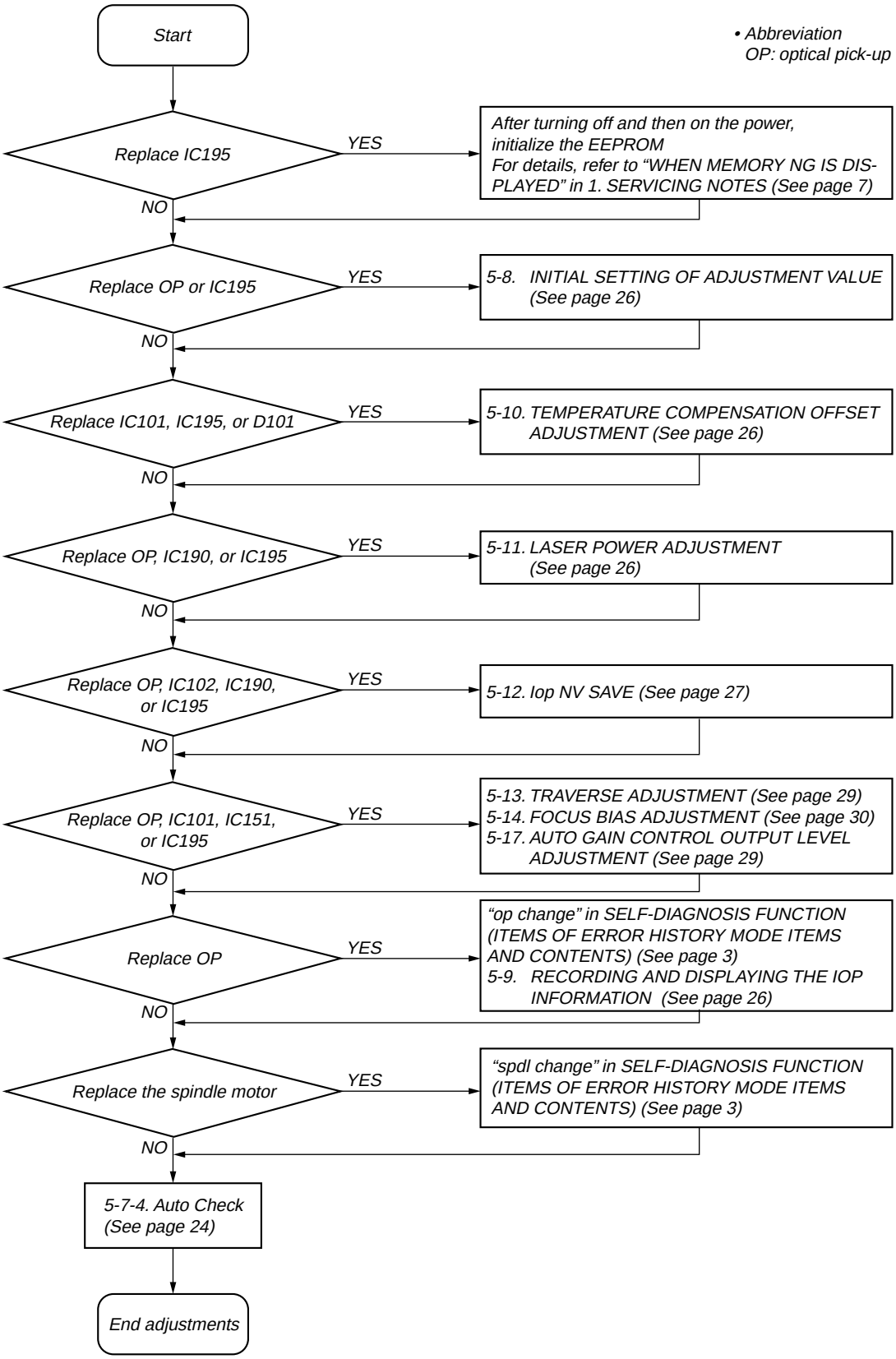
5-1. PARTS REPLACEMENT AND ADJUSTMENTS

If malfunctions caused by optical pick-up such as sound skipping are suspected, follow the following check.

Check before replacement



Adjustment flow

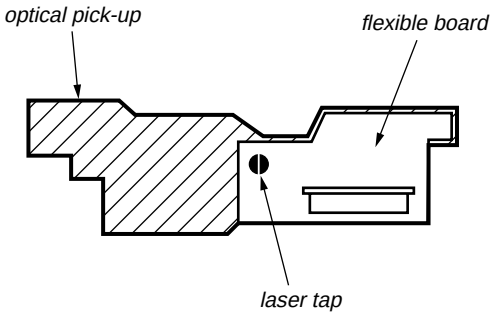


5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

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

5-3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-260B/260E)

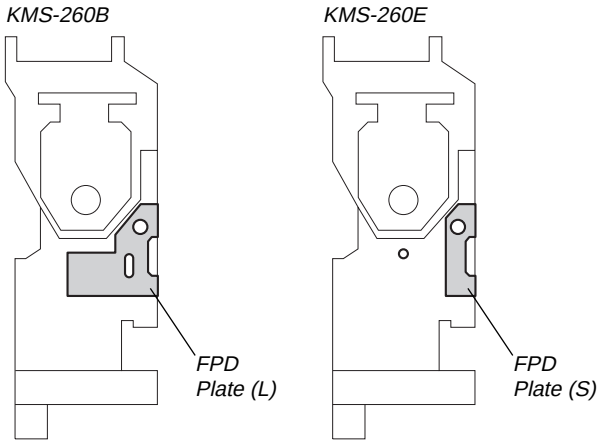
As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent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



Optical pick-up flexible board

5-4. HOW TO DISTINGUISH BETWEEN OPTICAL PICK-UP KMS-260B AND KMS-260E

Two types of optical pick-up, KMS-260B and KMS-260E, are used for this set at manufacturing , and each type has its own specified values for laser power check or laser power adjustment. Terefore, make sure to check which type of optical pick-up is used for the set before laser power check or laser power adjustment.
To find the type of optical pick-up is described as follows.



5-5. PRECAUTIONS FOR ADJUSTMENTS

1. When replacing the following parts, perform the adjustments and checks with ◯ in the order shown in the following table.
2. Set the test mode when performing adjustments.
   After completing the adjustments, release the test mode.
   Perform the adjustments and checks in “Group Service” of the test mode.
3. Perform the adjustments to be needed in the order shown.
4. Use the following tools and measuring devices.
   - Check Disc (TDYS-1) (Part No. : 4-963-646-01)
   - Test Disk (MDW-74/GA-1) (Part No. : 4-229-747-01)
   - Laser power meter LPM-8001 (Part No. : J-2501-046-A)
     or
     MD Laser power meter 8010S (Part No. : J-2501-145-A)*1
   - Oscilloscope (Measure after performing CAL of prove.)
   - Digital voltmeter
   - Thermometer
   - Jig for checking BD board waveform
     (Part No. : J-2501-196-A)
5. 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)
6. Using the above jig enables the waveform to be checked without the need to solder.
   (Refer to Servicing Notes on page 6)
7. As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

*1 **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.

Adjustment	Parts to be replaced						
	Optical Pick-up	IC101	IC102	IC151	IC190	IC195	D101
5-8. Initial setting of adjustment value	◯	×	×	×	×	◯	×
5-9. Recording and displaying of Iop information	◯	×	×	×	×	◯	×
5-10. Temperature compensation offset adjustment	×	◯	×	×	×	◯	◯
5-11. Laser power adjustment	◯	×	×	×	◯	◯	×
5-12. Iop NV Save	◯	×	◯	×	◯	◯	×
5-13. Traverse adjustment	◯	◯	×	◯	×	◯	×
5-14. Focus bias adjustment	◯	◯	×	◯	×	◯	×
5-17. Auto gain adjustment	◯	◯	×	◯	×	◯	×
5-7-4. Auto Check	◯	◯	×	◯	◯	◯	×

5-6. USING THE 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.

1. Insert a disc (blank disc) commercially available.
2. Turn the [I◀◀ AMS ▶▶I] knob to display "CREC 1MODE" (C35).
3. Press the [YES] button to display "CREC 1MID". Display "CREC 1(0300)" and start to recording.
4. Complete recording within 5 minutes.
5. Press the [MENU/NO] button and stop recording .
6. Press the [⏏] button and remove the disc.

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

Note: Be careful not to apply vibration during continuous recording.

5-7. CHECKS PRIOR TO REPAIRS

These checks are performed before replacing parts according to "approximate specifications" to determine the faulty locations. For details, refer to "5-1. Parts Replacement and Adjustments" (see page 20).

5-7-1. Temperature Compensation Offset Check

When performing adjustments, set the internal temperature and room temperature to 22 to 28ºC.

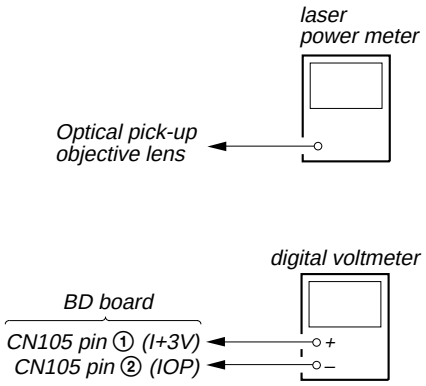
Procedure:

1. Turn the [I◀◀ AMS ▶▶I] knob to display "TEMP CHECK" (C12).
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.)

5-7-2. Laser Power Check

Check the type and IOP value of the optical pick-up before checks. (Refer to 5-4. How to Distinguish between Optical pick-up KMS-260B and KMS-260E (see page 22), 5-9. Recording and Displaying the IOP Information (see page 26))

Connection:



Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀◀] button or [▶▶] button to move the optical pick-up.) Connect the digital voltmeter to CN105 pin ① (I+3V) and CN105 pin ② (IOP).
2. Then, turn the [I◀◀ AMS ▶▶I] knob to display "LDPWR CHECK" (C13).
3. Press the [YES] button once to display "LD 0.9mW$". Check that the reading of the laser power meter become 0.85 to 0.91 mW (KMS-260B) or 0.90 to 0.96 mW (KMS-260E).
4. Press the [YES] button once more to display " LD 7.0mW$". Check that the reading the laser power meter and digital voltmeter satisfy the specified value.

Specified Value:

Laser power meter reading : 7.0 ± 0.2 mW (KMS-260B)
7.25 ± 0.25 mW (KMS-260E)
Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

KMS260B or E
20101
B0825

For details of the method for checking this value, refer to "5-9. Recording and Displaying the IOP Information"

IOP=82.5 mA in this case
IOP (mA) = Digital voltmeter reading (mV)/1 (Ω)

5. Press the [MENU/NO] button to display "LDPWR CHECK" (C13) and stop the laser emission. (The [MENU/NO] button is effective at all times to stop the laser emission.)

Note: After step 4, each time the [YES] button is pressed, the display will be switched between "LD 0.7W$", "LD 6.2mW$", and "LD WPホセイ$ ". Nothing needs to be performed here.

Checking Location: BD board (see page 30)

5-7-3. Iop Compare

The current Iop value at laser power 7.0 mW output and reference Iop value (set at shipment) written in the nonvolatile memory are compared, and the rate of increase/decrease will be displayed in percentage.

Note: Perform this function with the optical pick-up set at room temperature.

Procedure:

1. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop Compare" (C27).
2. Press the [YES] button and start measurements.
3. When measurements complete, the display changes to "± xx% yy". xx is the percentage of increase/decrease, and OK or NG is displayed at yy to indicate whether the percentage of increase/decrease is within the allowable range.
4. Press the [MENU/NO] button to end.

5-7-4. Auto Check

This test mode performs CREC and CPLAY automatically for mainly checking the characteristics of the optical pick-up. To perform this test mode, the laser power must first be checked. Perform Auto Check after the laser power check and Iop compare.

Procedure:

1. Turn the [I◀◀ AMS ▶▶I] knob to display "AUTO CHECK" (C01).
2. Press the [YES] button. If "LDPWR ミチェック" is displayed, it means that the laser power check has not been performed. In this case, perform the laser power check and Iop Compare, and then repeat from enter the test mode.
3. If a disc is in the mechanical deck, it will be ejected forcibly. "DISC IN" will be displayed in this case. Load a test disc (MDW-74/GA-1) which can be recorded.
4. If a disc is loaded at step 3, the check will start automatically.
5. When "XX CHECK" is displayed, the item corresponding to XX will be performed.
   When "06 CHECK" completes, the disc loaded at step 3 will be ejected. "DISC IN" will be displayed. Load the check disc (TDYS-1).
6. When the disc is loaded in the step 5, the check will automatically be resumed from "07 CHECK".
7. After completing to test item 12, check OK or NG will be displayed. If all items are OK, "CHECK ALL OK" will be displayed. If any item is NG, it will be displayed as "NG: xxxx".

When "CHECK ALL OK" is displayed, it means that the optical pick-up is normal. Check the operations of other parts (spindle motor, sled motor, etc.).
When displayed as "NG: xxxx", it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

5-7-5. Other Checks

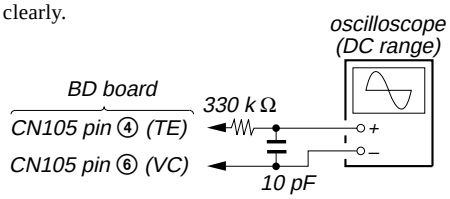
All the following checks are performed by the Auto Check mode. They therefore need not be performed in normal operation.

5-7-6. Traverse Check
5-7-7. Focus Bias Check
5-7-8. C PLAY Check
5-7-9. Self-Recording/Playback Check

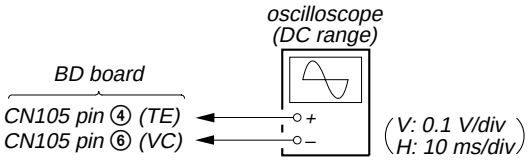
5-7-6. Traverse Check

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.



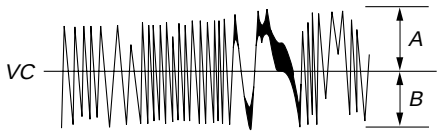
Connection:



Procedure:

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD board.
2. Load a disc (any available on the market). (Refer to Note 1)
3. Press the [▶▶] button to move the optical pick-up outside the pit.
4. Turn the [I◀◀ AMS ▶▶I] knob to display "EF MO CHECK" (C14).
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 [I◀◀ AMS ▶▶I] knob.
   (Read power traverse checking)

Traverse Waveform

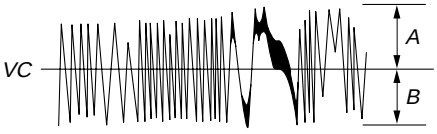


Specified value : Below 10% offset value

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

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 [I◀◀ AMS ▶▶I] knob.
   (Write power traverse checking)

Traverse Waveform



Specified value : Below 10% offset value

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

9. Press the [YES] button to display "EFB = ▯▯ MO-P". Then, the optical pick-up moves to the pit area automatically and servo is imposed.
10. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the [I◄◄ AMS ►►I] knob.

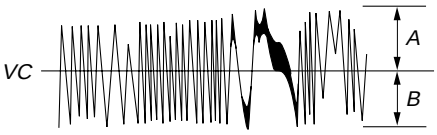
Traverse Waveform

Specified value : Below 10% offset value

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

11. Press the [YES] button to display "EF MO CHECK" (C14). The disc stops rotating automatically.
12. Press the [⏏] button and take out the disc.
13. Load the check disc (TDYS-1).
14. Turn the [I◄◄ AMS ►►I] knob to display "EF CD CHECK" (C15).
15. Press the [YES] button to display "EFB = ▯▯ CD". Servo is imposed automatically.
16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the [I◄◄ AMS ►►I] knob.

Traverse Waveform



Specified value : Below 10% offset value

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

17. Press the [YES] button to display "EF CD CHECK" (C15).
18. Press the [⏏] button and take out the check disc (TDYS-1).

Checking Location: BD board (see page 30)

5-7-7. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

Procedure:

1. Load the test disc (MDW-74/GA-1).
2. Turn the [I◄◄ AMS ►►I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button to display "CPLAY1MID".
4. Press the [MENU/NO] button when "C = ▯▯▯▯ AD = ▯▯)" is displayed.
5. Turn the [I◄◄ AMS ►►I] knob to display "FBIAS CHECK" (C16).
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 20 and ADER is below 2.
7. Press the [YES] button to display "▯▯▯▯/▯▯ b = ▯▯". Check that the C1 error is about 100 and ADER is below 2.
8. Press the [YES] button to display "▯▯▯▯/▯▯ a = ▯▯". Check that the C1 error is about 100 and ADER is below 2.
9. Press the [MENU/NO] button, then press the [⏏] button and take out the test disc (MDW-74/GA-1).

5-7-8. C PLAY Check

MO Error Rate Check

Procedure:

1. Load the test disc (MDW-74/GA-1).
2. Turn the [I◄◄ AMS ►►I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button to display "CPLAY1MID".
4. The display changes to "C = ▯▯▯▯ AD = ▯▯)".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the [MENU/NO] button to stop playback, then press the [⏏] button and take out the test disc (MDW-74/GA-1).

CD Error Rate Check

Procedure:

1. Load the check disc (TDYS-1).
2. Turn the [I◄◄ AMS ►►I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button to display "CPLAY1MID".
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 [⏏] button and take out the check disc (TDYS-1).

5-7-9. Self-Recording/playback Check

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

Procedure:

1. Load a recordable disc (blank disc).
2. Turn the [I◄◄ AMS ►►I] knob to display "CREC 1MODE" (C35).
3. Press the [YES] button to display "CREC 1MID".
4. When recording starts, lights up " **REC** " and display "CREC 1 (@@@@)" (@@@@ is the address).
5. About 1 minute later, press the [MENU/NO] button to stop continuous recording.
6. Turn the [I◄◄ AMS ►►I] knob to display "CPLAY1MODE" (C34).
7. Press the [YES] button to display "CPLAY1MID".
8. "C = ▯▯▯▯ AD = ▯▯)" will be displayed.
9. Check that the C1 error becomes below 20 and the AD error below 2.
10. Press the [MENU/NO] button to stop playback, then press the [⏏] button and take out the disc.

5-8. 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 "5-5. Precautions for Adjustments" (See page 22) and execute the initial setting before the adjustment as required.

Procedure:
1. Turn the [I◀◀ AMS ▶▶I] knob to display "ADJ CLEAR" (C28).
2. Press the [YES] button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" (C28) will be displayed.

5-9. 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 [I◀◀ AMS ▶▶I] knob to display "Iop Write" (C05), and press the [YES] 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 [I◀◀ AMS ▶▶I] knob.
   To select the digit : Press the [I◀◀ AMS ▶▶I] button.
4. When the [YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
5. As the adjustment results are recorded for the step 4 value. Leave it as it is and press the [YES] button.
6. "Complete!!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write" (C05).

Display Procedure:
1. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop Read"(C26).
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 [I◀◀ AMS ▶▶I] knob and [MENU/NO] button to display "Iop Read" (C26).

5-10. 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.

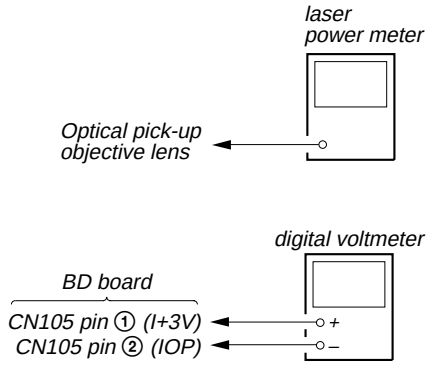
Procedure:
1. Turn the [I◀◀ AMS ▶▶I] knob to display "TEMP ADJUST" (C03).
2. Press the [YES] button to select the "TEMP ADJUST" mode.
3. "TEMP = ⬚ [OK]" and the current temperature data will be displayed.
4. To save the data, press the [YES] button.
   When not saving the data, press the [MENU/NO] button.
5. When the [YES] button is pressed, "TEMP = ⬚ SAVE" will be displayed and turned back to "TEMP ADJUST" (C03) display then. When the [MENU/NO] button is pressed, "TEMP ADJUST" (C03) will be displayed immediately.

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

5-11. LASER POWER ADJUSTMENT

Check the type and IOP value of the optical pick-up before adjustments. (Refer to 5-4. How to Distinguish between Optical pick-up KMS-260B and KMS-260E (see page 22), 5-9. Recording and Displaying the IOP Information)

Connection:



Procedure:
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀◀] button and [▶▶] button to move the optical pick-up)
   Connect the digital voltmeter to CN105 pin ① (I+3V) and CN105pin ② (IOP) on the BD board.
2. Turn the [I◀◀ AMS ▶▶I] knob to display "LDPWR ADJUST" (C04).
   (Laser power : For adjustment)
3. Press the [YES] button once to display "LD 0.9 mW $ ⬚".
4. Turn the [I◀◀ AMS ▶▶I] knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the [YES] button after setting the range knob of the laser power meter becomes 10 mW, and save the adjustment results. ("LD SAVE $ ⬚" will be displayed for a moment)
5. Then "LD 7.0 mW $ ⬚" will be displayed.

6. Turn the [I◀◀ AMS ▶▶I] knob so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the [YES] button to save it. ("LD SAVE $ ⬚⬚" will be displayed for a moment)

Note: Do not perform the emission with 7.0 mW more than 15 seconds continuously.

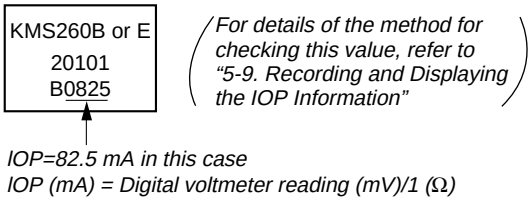
7. Then, turn the [I◀◀ AMS ▶▶I] knob to display "LDPWR CHECK" (C13).
8. Press the [YES] button once to display "LD 0.9mW$ ⬚⬚". Check that the reading of the laser power meter become 0.85 to 0.91 mW (KMS-260B) or 0.90 to 0.96 mW (KMS-260E).
9. Press the [YES] button once more to display "LD 7.0mW$ ⬚⬚". Check that the reading the laser power meter and digital voltmeter satisfy the specified value.
   Note down the digital voltmeter reading value.

Specified Value:

Laser power meter reading: 7.0 ± 0.1 mW (KMS-260B)
7.25 ± 0.05 mW (KMS-260E)

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

(Optical pick-up label)



10. Press the [MENU/NO] button to display "LDPWR CHECK" (C13) and stop the laser emission.
    (The [MENU/NO] button is effective at all times to stop the laser emission)
11. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop Write" (C05).
12. Press the [YES] button. When the display becomes Ref=@@@.@ (@ is an arbitrary number), press the [YES] button to display "Measu=@@@.@" (@ is an arbitrary number).
13. The numbers which can be changed will blink. Input the IOP value noted down at step 9.
    To select the number : Turn the [I◀◀ AMS ▶▶I] knob.
    To select the digit : Press the [I◀◀ AMS ▶▶I] knob.
14. 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" (C05).

Note: After step 9, each time the [YES] button is pressed, the display will be switched "LD 0.7mW$ ⬚⬚", "LD 6.2mW$ ⬚⬚", and "LD WPホセイ$ ⬚⬚". Nothing needs to be performed here.

Adjustment Location: BD board (see page 30)

5-12. Iop NV SAVE

Write the reference values in the nonvolatile memory to perform "Iop compare". As this involves rewriting the reference values, do not perform this procedure except when adjusting the laser power during replacement of the optical pick-up and when replacing the IC102. Otherwise the optical pick-up check may deteriorate.

Note: Perform this function with the optical pick-up set at room temperature.

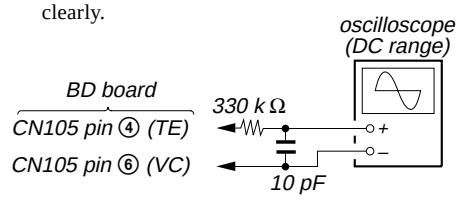
Procedure:

1. Turn the [I◀◀ AMS ▶▶I] knob to display "Iop NV Save" (C06).
2. Press the [YES] button and display "Iop [stop]".
3. After the display changes to "Iop =xxsave?", press the [YES] button.
4. After "Complete!" is displayed momentarily, the display changes to "Iop 7.0mW".
5. After the display changes to "Iop=yysave?", press the [YES] button.
6. When "Complete!" is displayed, it means that Iop NV saving has been completed.

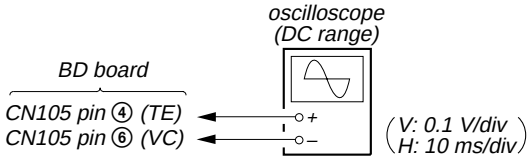
5-13. TRAVERSE ADJUSTMENT

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.



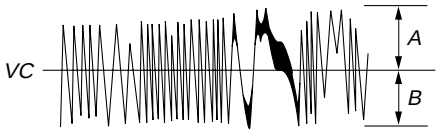
Connection:



Procedure:

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD board.
2. Load a disc (any available on the market). (Refer to Note 1)
3. Press the [▶▶] button to move the optical pick-up outside the pit.
4. Turn the [I◀◀ AMS ▶▶I] knob to display "EF MO ADJUST" (C07).
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. Turn the [I◀◀ AMS ▶▶I] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [I◀◀AMS▶▶I] knob is turned, the ⬚ of "EFB= ⬚" 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

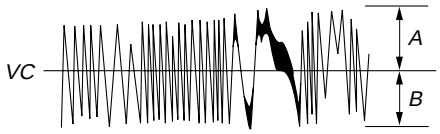


Specification A = B

7. Press the [YES] button and save the result of adjustment to the non-volatile memory ("EFB = ⬚ SAVE" will be displayed for a moment. Then "EFB = ⬚ MO-W" will be displayed).

8. Turn the [I◀◀AMS ▶▶I] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [I◀◀AMS▶▶I] knob is turned, the □□ of "EFB= □□" 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.
   (Write power traverse adjustment)

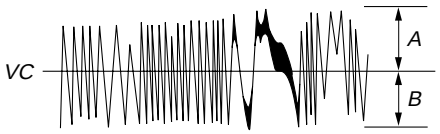
Traverse Waveform



Specification A = B

9. Press the [YES] button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAVE" will be displayed for a moment)
10. "EFB = □□ MO-P" will be displayed.
    The optical pick-up moves to the pit area automatically and servo is imposed.
11. Turn the [I◀◀AMS ▶▶I] knob until the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

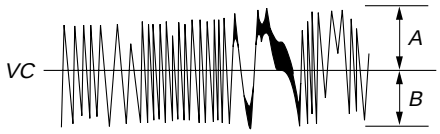
Traverse Waveform



Specification A = B

12. Press the [YES] button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAVE" will be displayed for a moment)
    Next "EF MO ADJUST" (C07) is displayed. The disc stops rotating automatically.
13. Press the [⏏] button and take out the disc.
14. Load the check disc (TDYS-1).
15. Turn the [I◀◀AMS ▶▶I] knob to display "EF CD ADJUST" (C08).
16. Press the [YES] button to display "EFB = □□ CD". Servo is imposed automatically.
17. Turn the [I◀◀AMS ▶▶I] knob so that the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

Traverse Waveform



Specification A = B

18. Press the [YES] button, display "EFB = □□ SAVE" for a moment and save the adjustment results in the non-volatile memory.
    Next "EF CD ADJUST" (C08) will be displayed.
19. Press the [⏏] button and take out the check disc (TDYS-1).

Adjustment Location: BD board (see page 30)

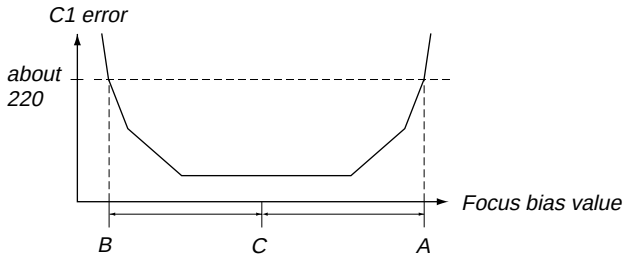
5-14. FOCUS BIAS ADJUSTMENT

Procedure:

1. Load the continuously-recorded disc. (Refer to "5-6. USING THE CONTINUOUSLY RECORDED DISC" (See page 23))
2. Turn the [I◀◀ AMS ▶▶I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button to display "CPLAY1MID".
4. Press the [MENU/NO] button when "C = □□□□ AD = □□)" is displayed.
5. Turn the [I◀◀ AMS ▶▶I] knob to display "FBIAS ADJUST" (C09).
6. Press the [YES] button to display "□□□□/□□ a = □□ T".
   The first four digits indicate the C1 error rate, the two digits after "/ " indicate ADER, and the 2 digits after "a =" indicate the focus bias value.
7. Turn the [I◀◀ AMS ▶▶I] knob in the clockwise and find the focus bias value at which the C1 error rate becomes about 220 (refer to Note 2).
8. Press the [YES] button to display "□□□□/□□ b = □□ T".
9. Turn the [I◀◀AMS▶▶I] knob in the counterclockwise and find the focus bias value at which the C1 error rate becomes about 220.
10. Press the [YES] button to display "□□□□/□□ c = □□ T".
11. Check that the C1 error rate is below 20 and ADER is 00. Then press the [YES] button.
12. If the "(□□)" in "□□ - □□ - □□ (□□)" is above 20, press the [YES] button.
    If below 20, press the [MENU/NO] button and repeat the adjustment from step 2.
13. Press the [⏏] button and take out the disc.

Note 1: The relation between the C1 error and focus bias is as shown in the following figure. Find points A and B in the following figure using the above adjustment. The focal point position C is automatically calculated from points A and B.

Note 2: As the C1 error rate changes, perform the adjustment using the average vale.



5-15. ERROR RATE CHECK

5-15-1. CD Error Rate Check

Procedure:

1. Load the check disc (TDYS-1).
2. Turn the [I◀◀ AMS ▶▶I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button twice and display "CPLAY1MID".
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 [⏏] button and take out the check disc (TDYS-1).

5-15-2. MO Error Rate Check

Procedure:

1. Load the continuously-recorded disc. (Refer to "5-6. USING THE CONTINUOUSLY RECORDED DISC" (See page 23))
2. Turn the [I◀◀ AMS ▶▶I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button to display "CPLAY1MID".
4. The display changes to "C = □□□□ AD = □□)".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the [MENU/NO] button to stop playback, then press the [⏏] button and take out the disc.

5-16. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

Procedure:

1. Load the continuously-recorded disc. (Refer to "5-6. USING THE CONTINUOUSLY RECORDED DISC" (See page 23))
2. Turn the [I◀◀ AMS ▶▶I] knob to display "CPLAY1MODE" (C34).
3. Press the [YES] button twice to display "CPLAY1MID".
4. Press the [MENU/NO] button when "C = □□□□ AD = □□)" is displayed.
5. Turn the [I◀◀ AMS ▶▶I] knob to display "FBIAS CHECK" (C16).
6. Press the [YES] button to display "□□□□/□□ c = □□ T".
   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 20 and ADER is below 2.
7. Press the [YES] button and display "□□□□/□□ b = □□ T".
   Check that the C1 error is below 100 and ADER is below 2.
8. Press the [YES] button and display "□□□□/□□ a = □□ T".
   Check that the C1 error is below 100 and ADER is below 2
9. Press the [MENU/NO] button, then press the [⏏] button and take out the disc.

Note: 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.

5-17. 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.

5-17-1. CD Auto Gain Control Output Level Adjustment

Procedure:

1. Load the check disc (TDYS-1).
2. Turn the [I◀◀AMS▶▶I] knob to display "AG Set (CD)" (C11).
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)" (C11).
4. Press the [⏏] button and take out the check disc (TDYS-1).

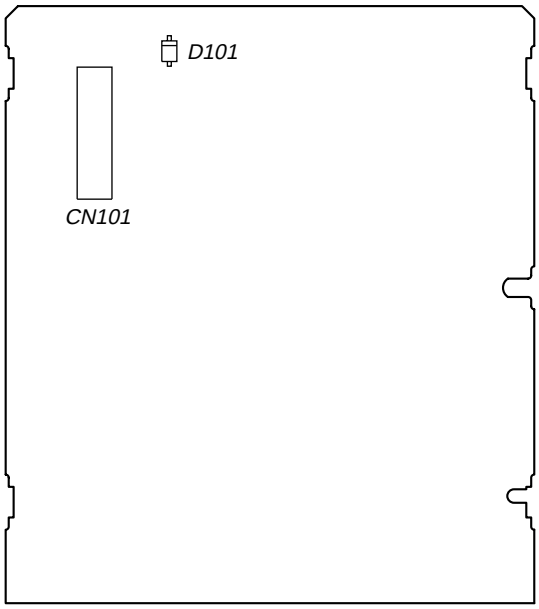
5-17-2. MO Auto Gain Control Output Level Adjustment

Procedure:

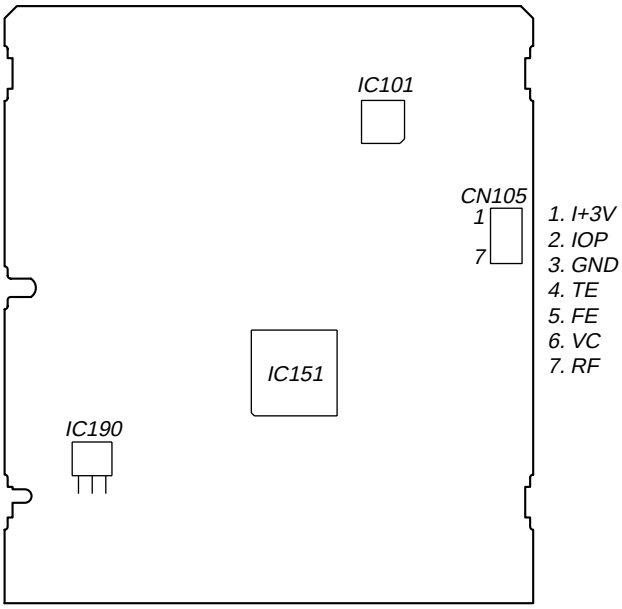
1. Load the test disc (MDW-74/GA-1).
2. Turn the [I◀◀AMS▶▶I] knob to display "AG Set (MO)" (C10).
3. When the [YES] button is pressed, the adjustment will be performed automatically.
   "Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)" (C10).
4. Press the [⏏] button and take out the test disc (MDW-74/GA-1).

Adjustment and checking Loacation:

– BD BOARD (Component Side) –



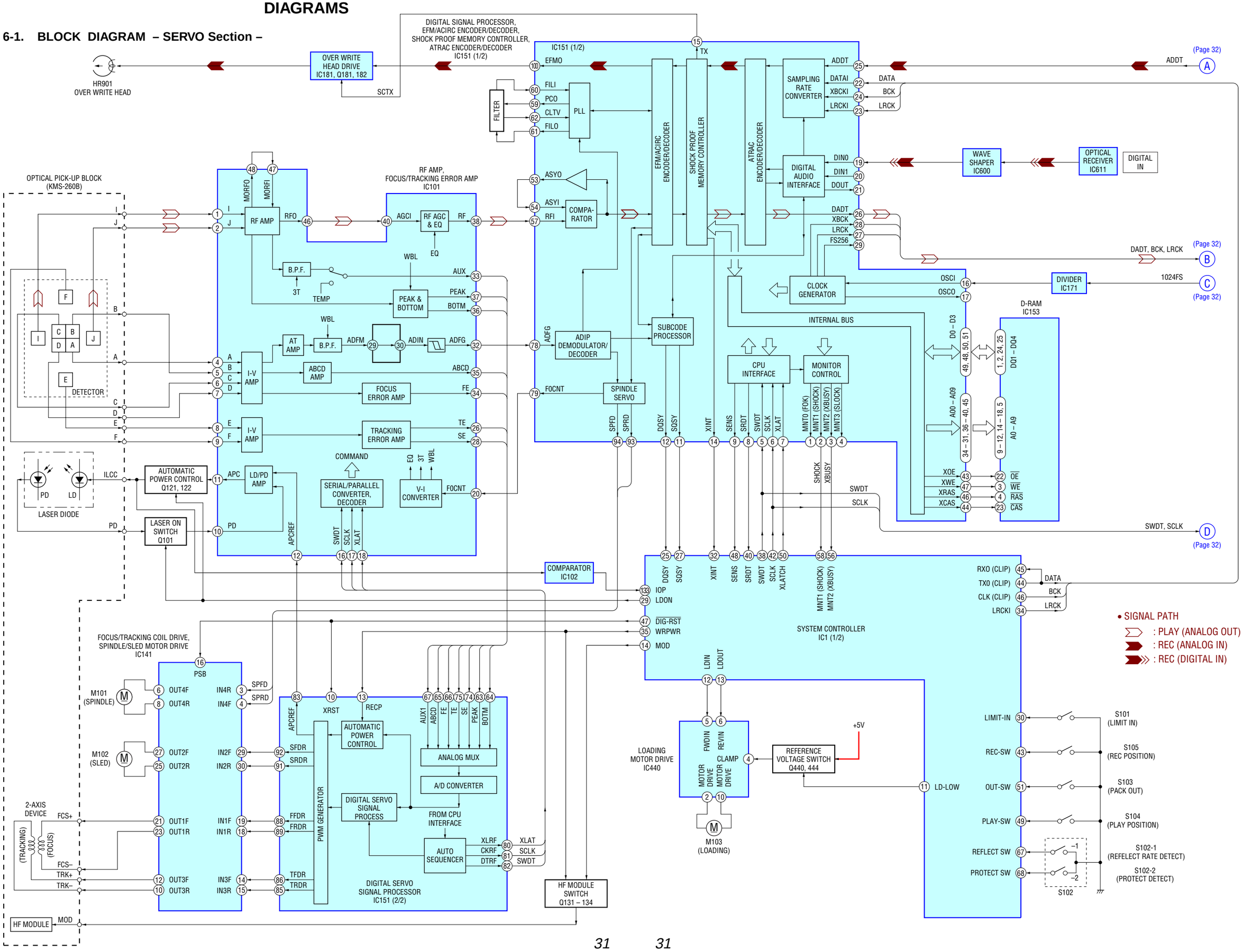
– BD BOARD (Conductor Side) –



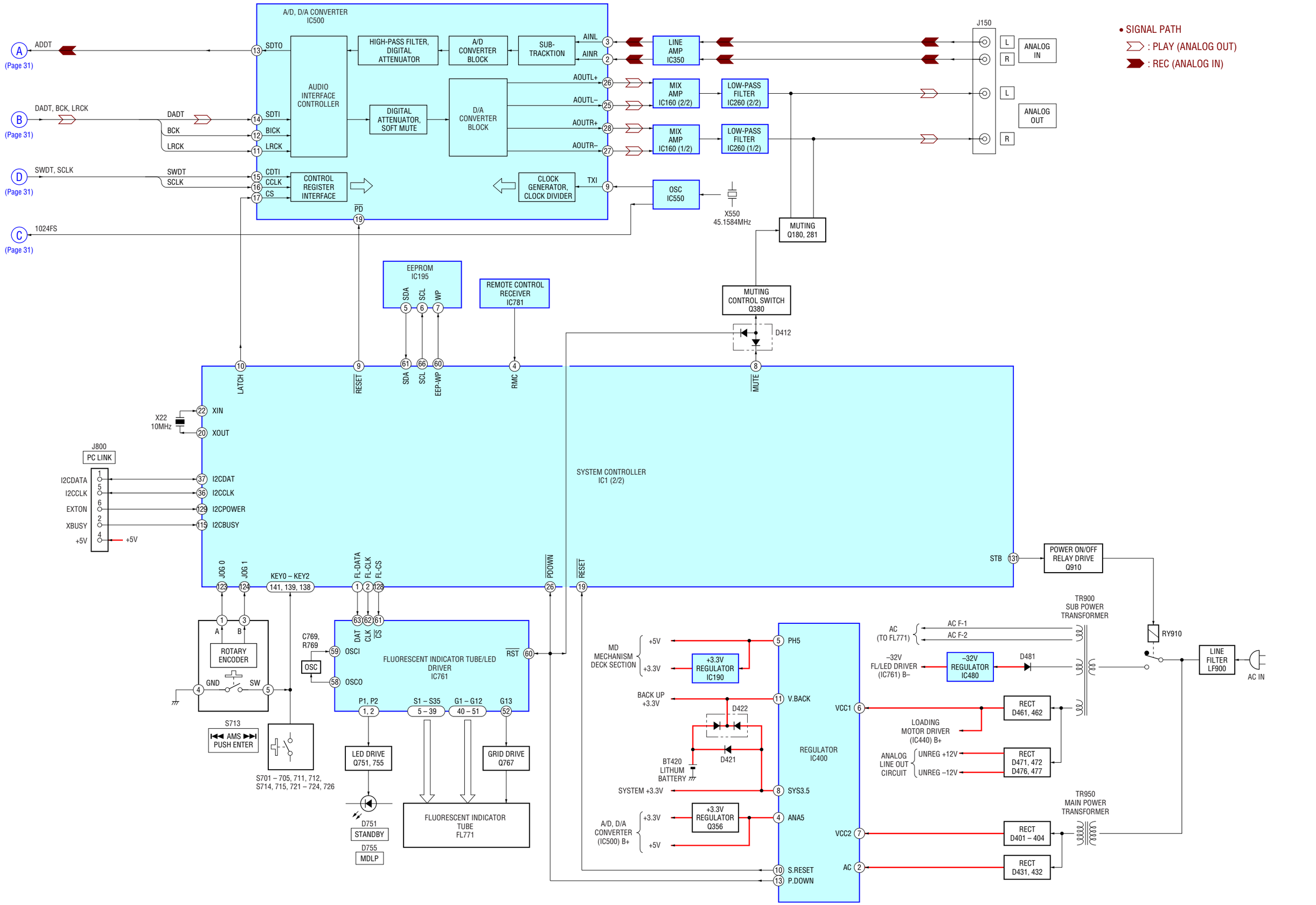
Note: It is useful to use the jig for checking BD board waveform. (Refer to Servicing Notes on page 6)

SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM – SERVO Section –



6-2. BLOCK DIAGRAM – MAIN Section –



6-3. NOTE FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

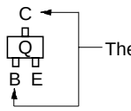
Note on Printed Wiring Board:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▬ : Pattern from the side which enables seeing.

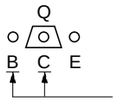
(The other layers' patterns are not indicated.)

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

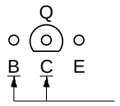
- Indication of transistor



These are omitted.



These are omitted.



These are omitted.

Note on Schematic Diagram:

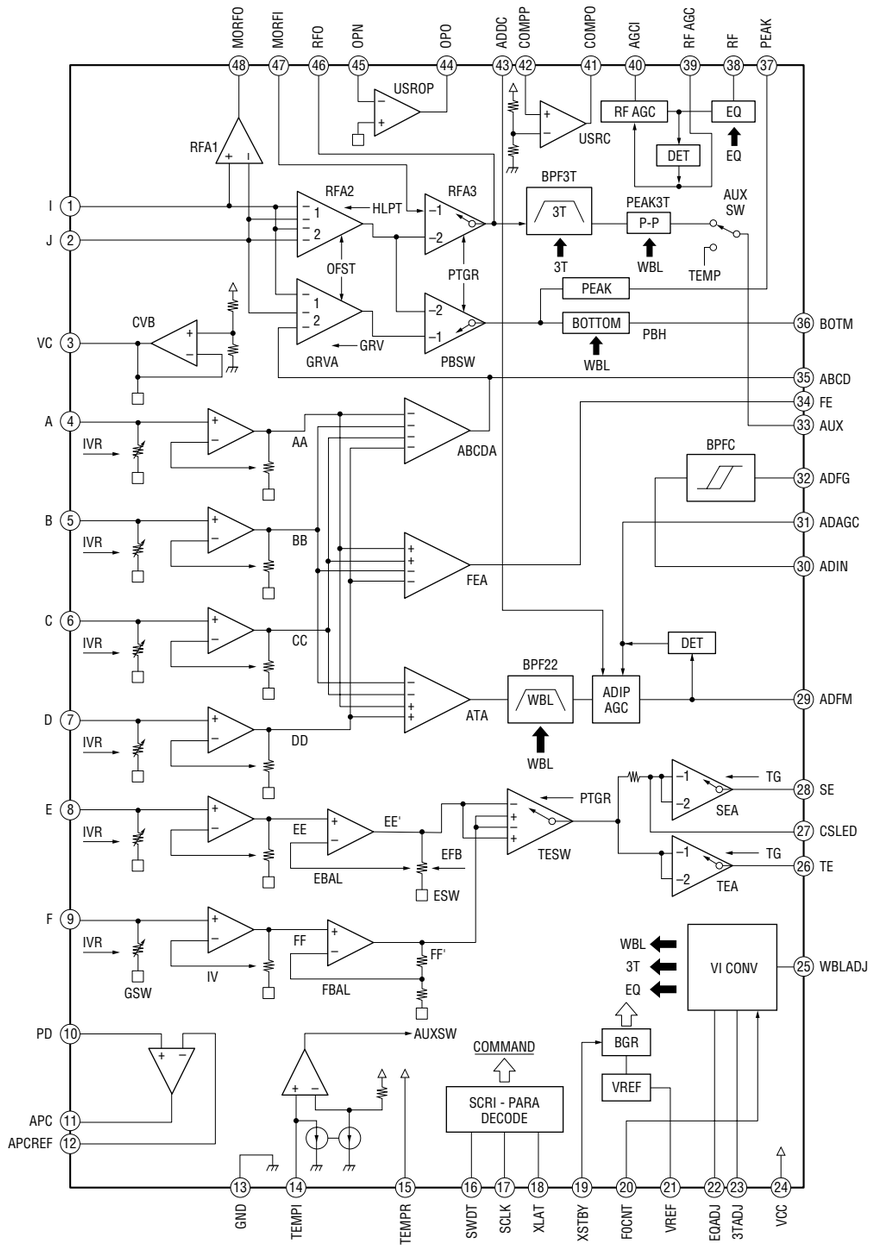
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ⊏⊐ : fusible resistor.
- ▭ : panel designation.

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

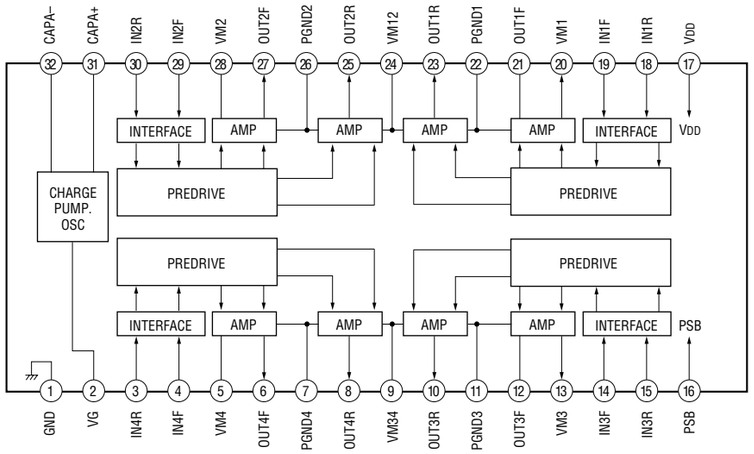
- ▬▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : STOP
  ( ) : PLAY
  < > : REC
  ∗ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : PLAY (ANALOG OUT)
  : REC (ANALOG IN)
  : REC (DIGITAL IN)

• IC Block Diagrams
– BD Board –

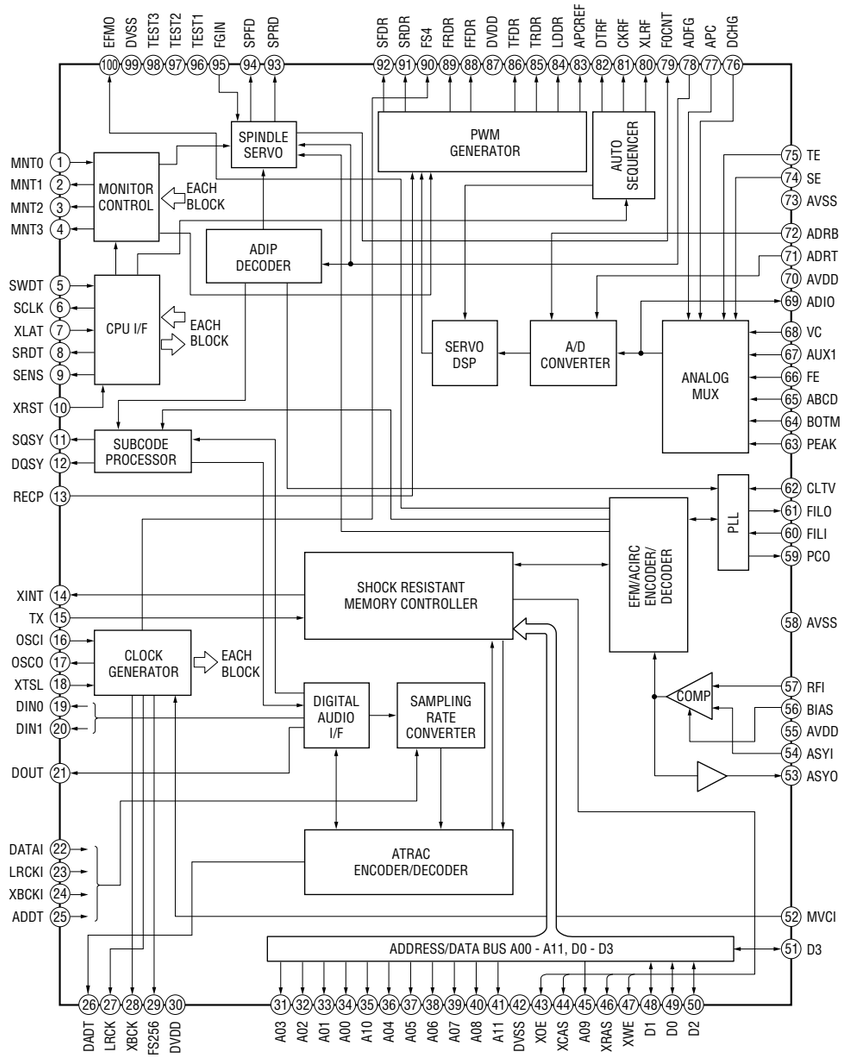
IC101 CXA2523AR



IC141 BH6519FS-E2

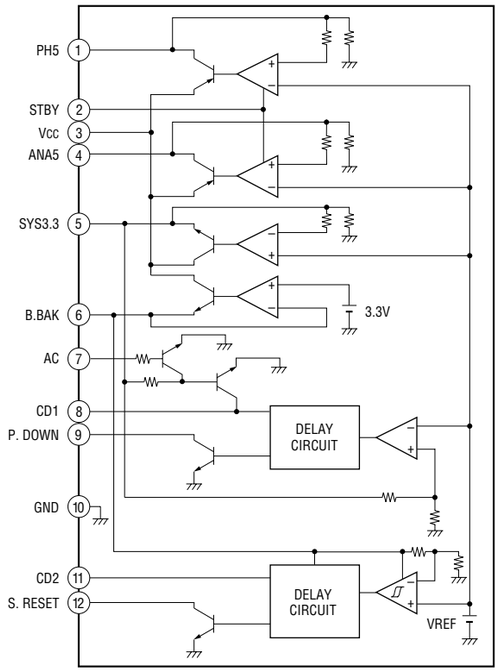


IC151 CXD2662R

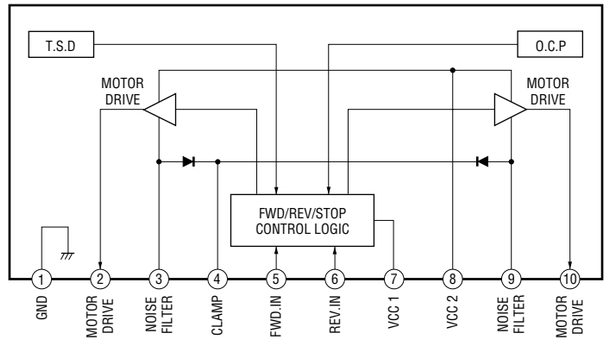


– MAIN Board –

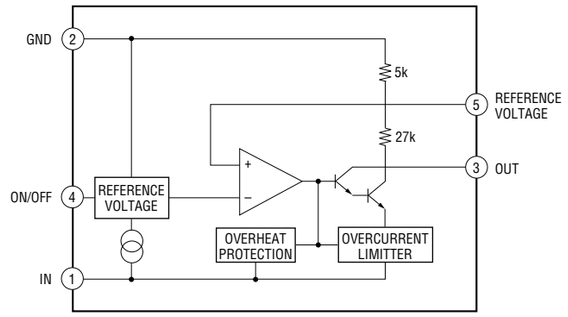
IC400 LA5643



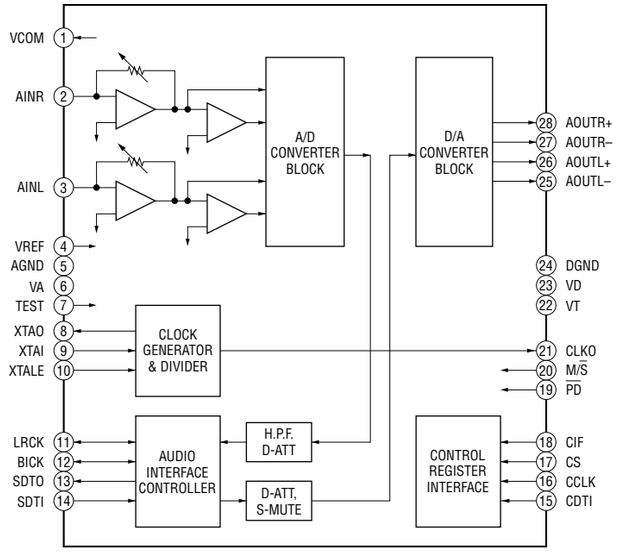
IC440 LB1641



IC480 M5293L

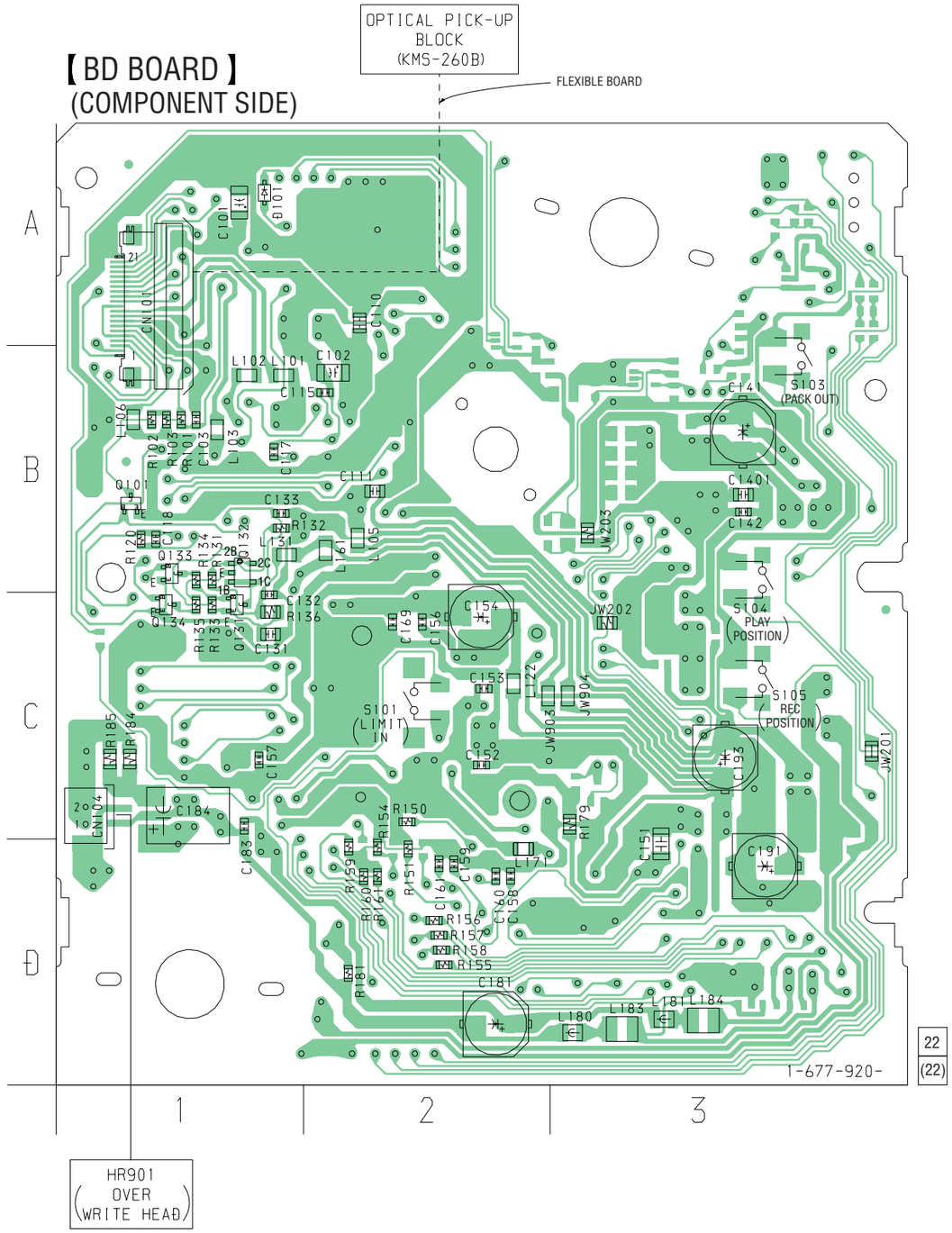


IC500 AK4524

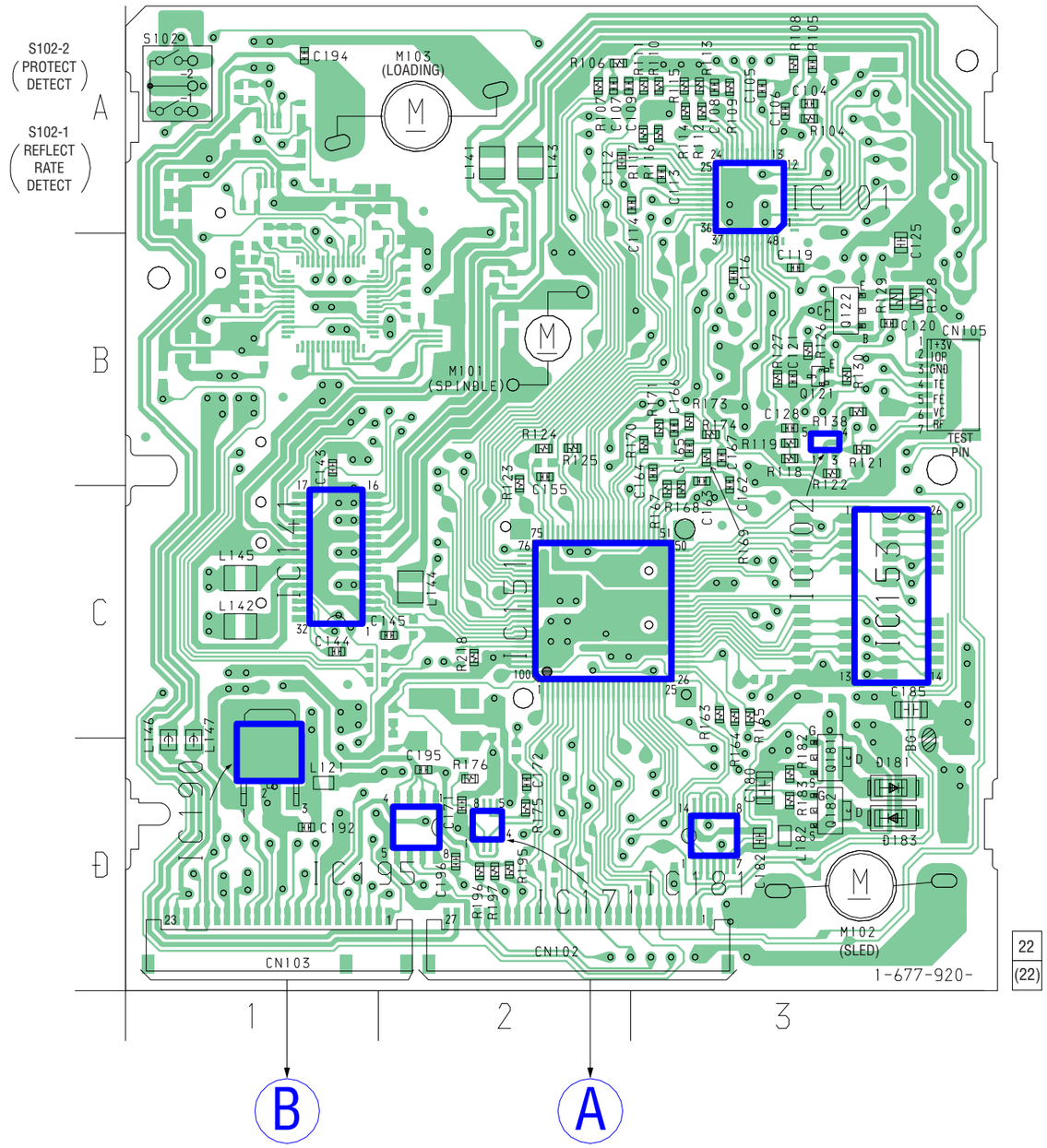


6-4. PRINTED WIRING BOARDS – BD Board –

【BD BOARD】
(COMPONENT SIDE)



【BD BOARD】(CONDUCTOR SIDE)



B
MAIN BOARD CN400
(Page 38)

A
MAIN BOARD CN1
(Page 38)

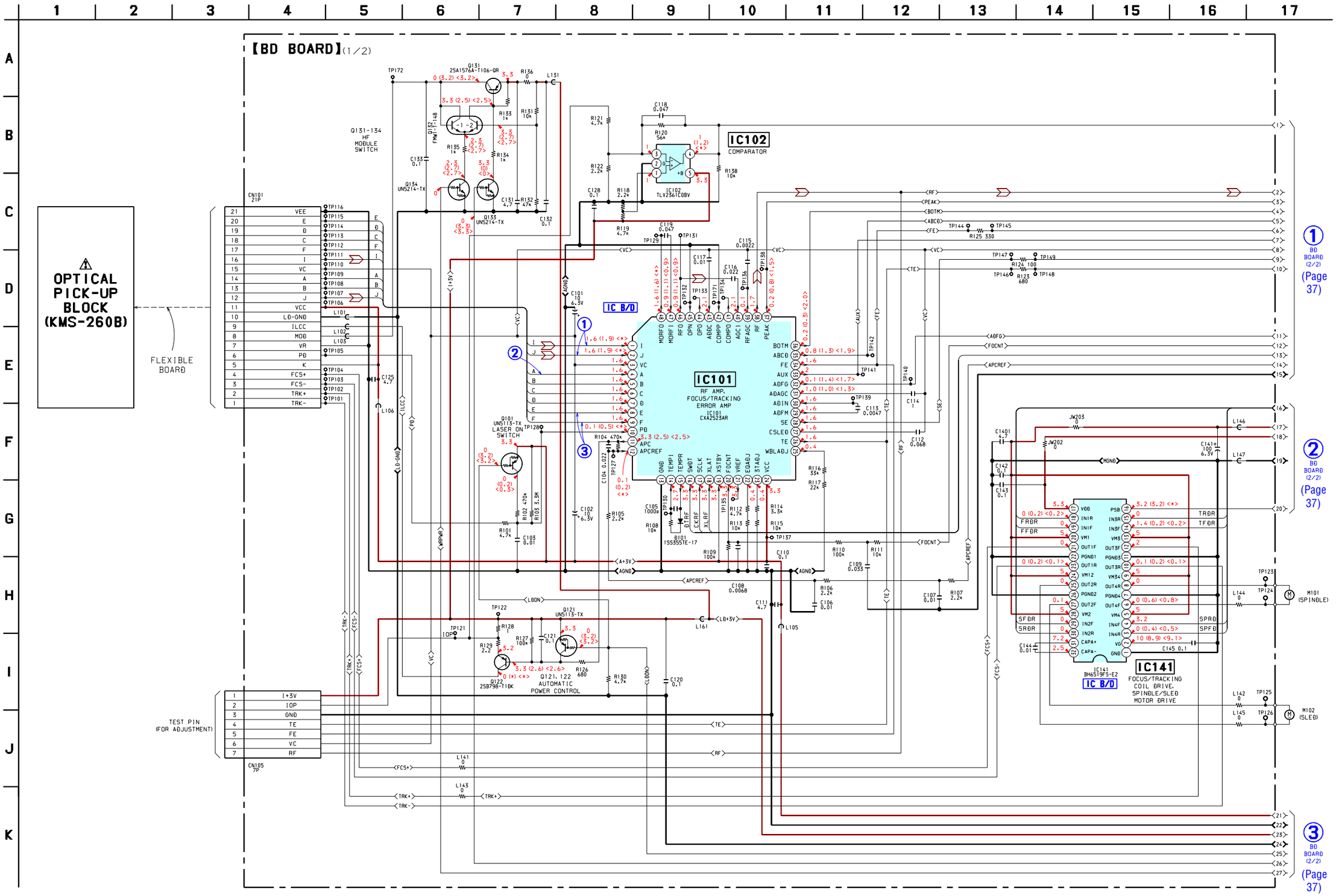
- **Semiconductor Location**

Ref. No.	Location
D101	A-1
Q101	B-1
Q131	C-1
Q132	B-1
Q133	B-1
Q134	C-1

- **Semiconductor Location**

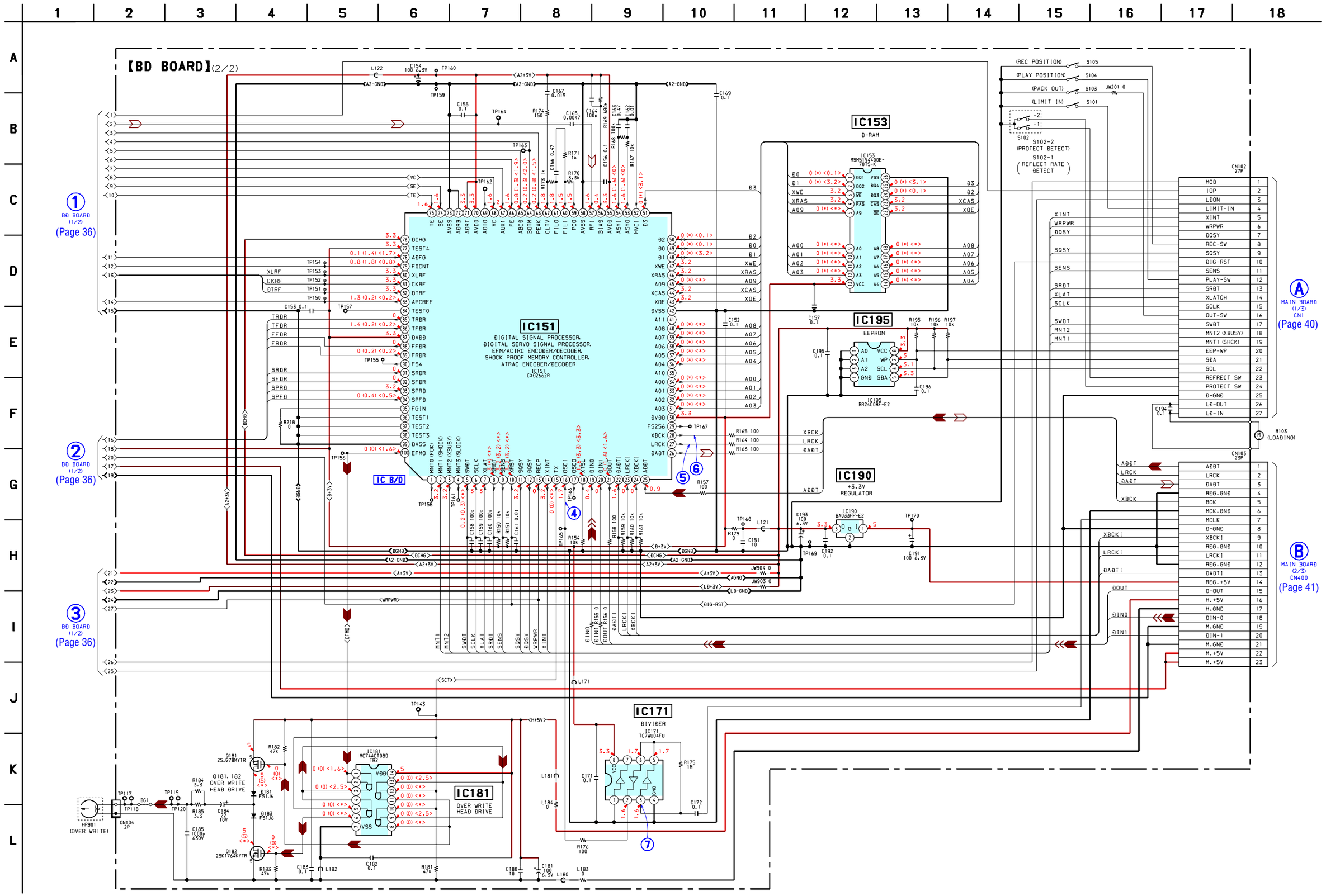
Ref. No.	Location	Ref. No.	Location
D181	D-3	IC181	D-3
D183	D-3	IC190	D-1
		IC195	D-2
IC101	A-3		
IC102	B-3	Q121	B-3
IC141	C-1	Q122	B-3
IC151	C-2	Q181	D-3
IC153	C-3	Q182	D-3
IC171	D-2		

6-5. SCHEMATIC DIAGRAM – BD Board (1/2) – • See page 43 for Waveforms. • See page 33 for IC Block Diagrams.



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

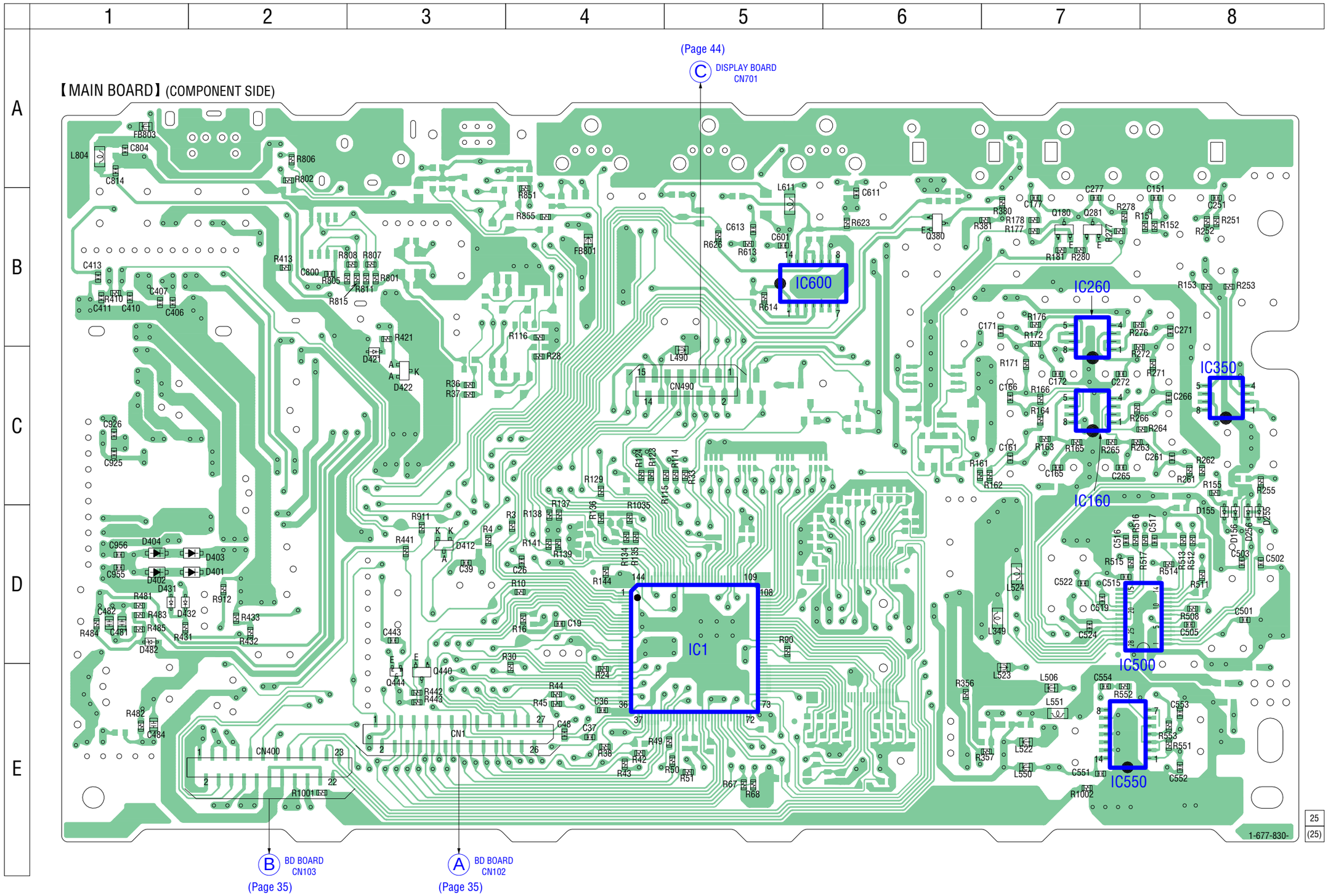
6-6. SCHEMATIC DIAGRAM – BD Board (2/2) – • See page 43 for Waveforms. • See page 33 for IC Block Diagram.



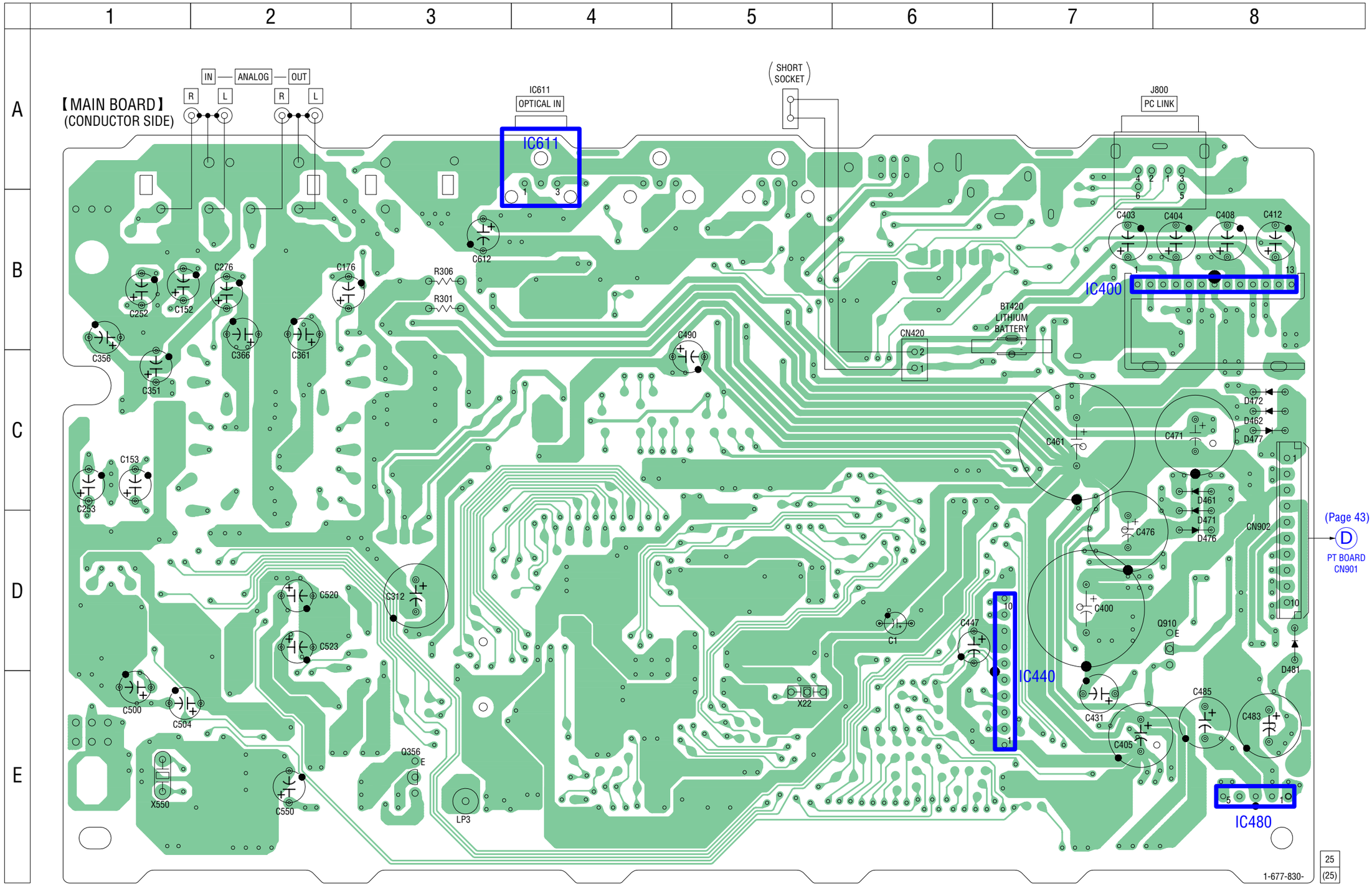
6-7. PRINTED WIRING BOARD – MAIN Board (Component Side) –

- **Semiconductor Location**

Ref. No.	Location
D155	D-8
D156	D-8
D255	D-8
D256	D-8
D401	D-2
D402	D-1
D403	D-2
D404	D-1
D412	D-3
D421	C-3
D422	C-3
D431	D-1
D432	D-1
D482	D-1
IC1	D-5
IC160	C-7
IC260	B-7
IC350	C-8
IC500	D-8
IC550	E-7
IC600	B-5
Q180	B-7
Q281	B-7
Q380	B-6
Q440	E-3
Q444	E-3



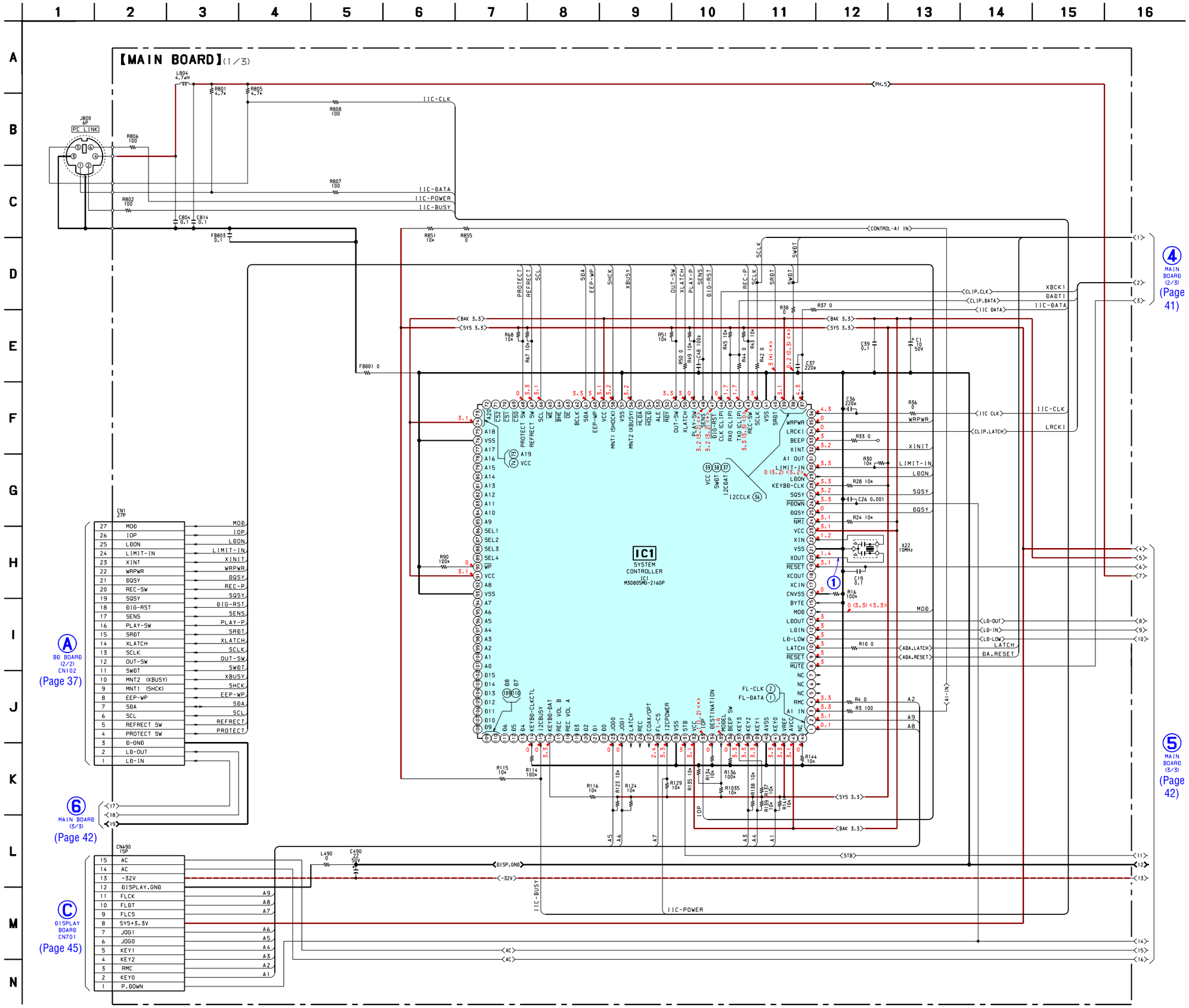
6-8. PRINTED WIRING BOARD – MAIN Board (Conductor Side) –



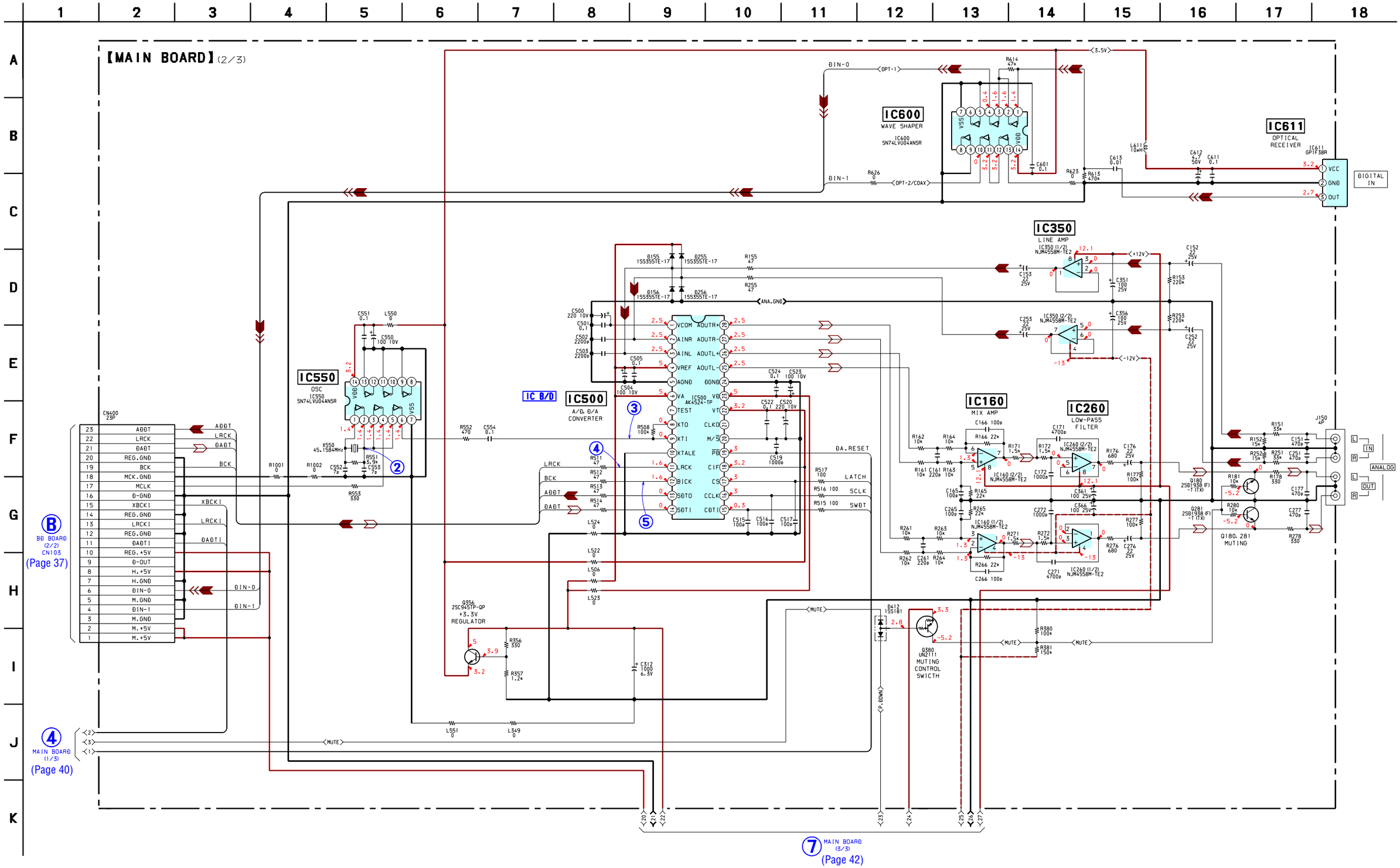
- **Semiconductor Location**

Ref. No.	Location
D461	C-8
D462	C-8
D471	D-8
D472	C-8
D476	D-8
D477	C-8
D481	D-8
IC400	B-8
IC440	E-7
IC480	E-8
IC611	A-4
Q356	E-3
Q910	D-8

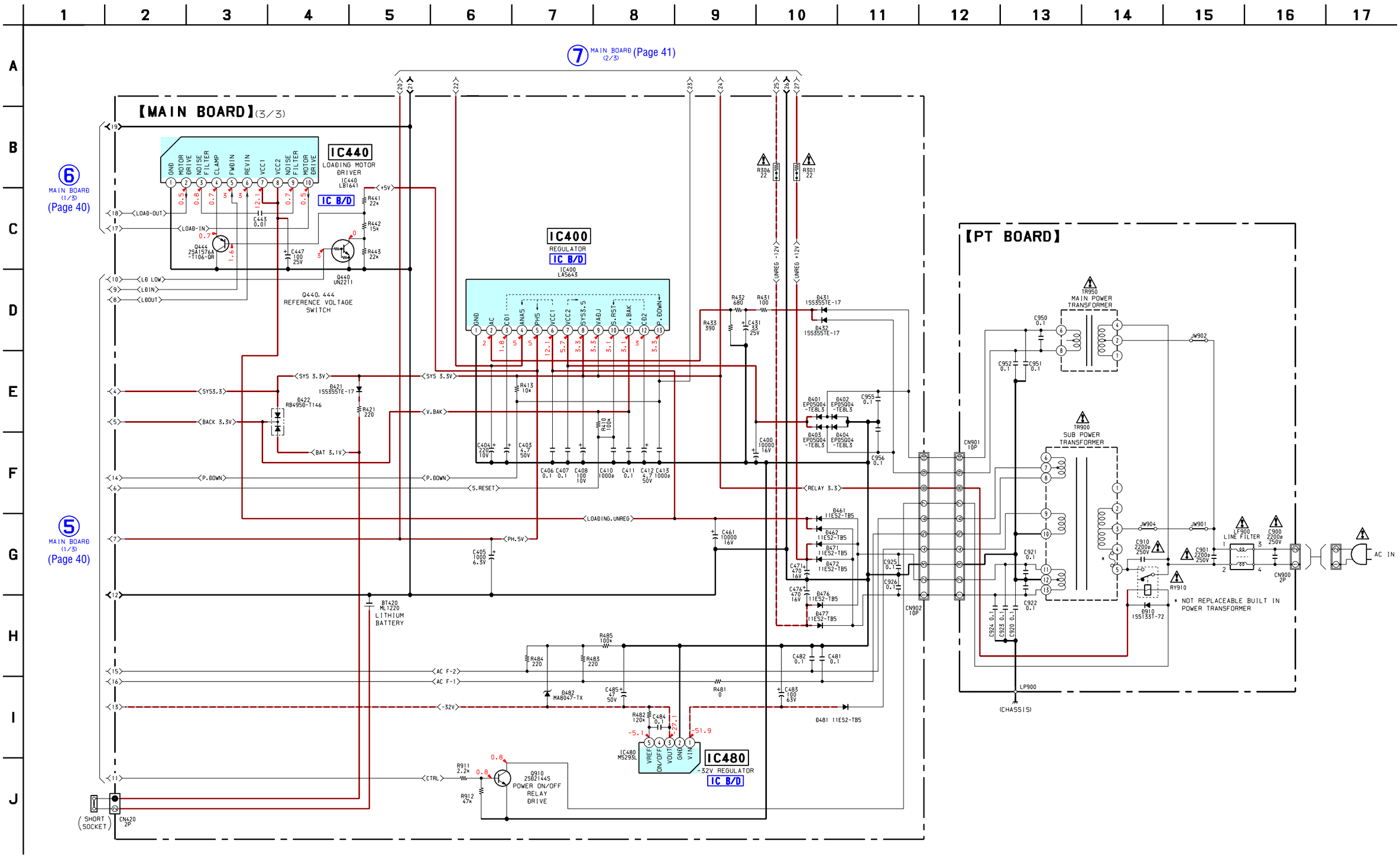
6-9. SCHEMATIC DIAGRAM – MAIN Board (1/3) – • See page 43 for Waveform.



6-10. SCHEMATIC DIAGRAM – MAIN Board (2/3) – • See page 43 for Waveforms. • See page 33 for IC Block Diagram.



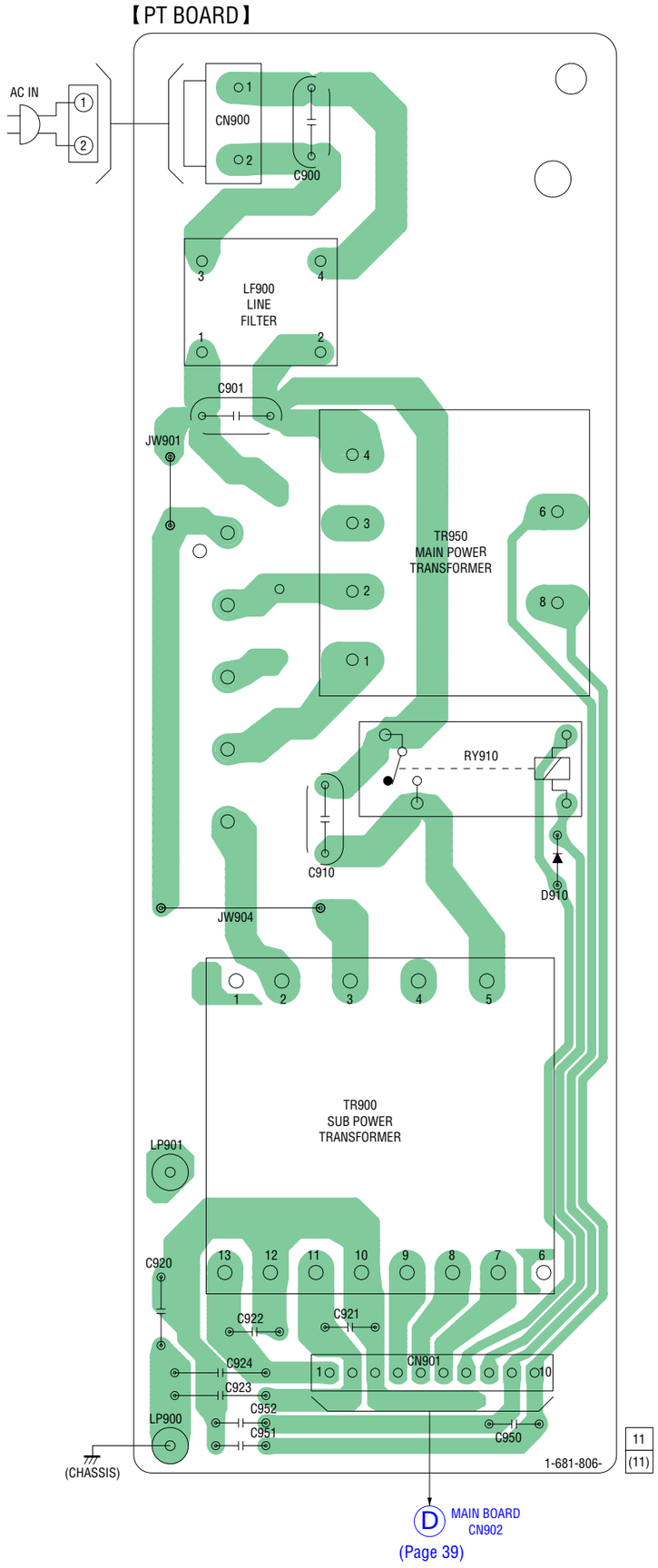
6-11. SCHEMATIC DIAGRAM – MAIN (3/3)/PT Boards – • See page 33 for IC Block Diagrams.



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

6-12. PRINTED WIRING BOARD – PT Board –

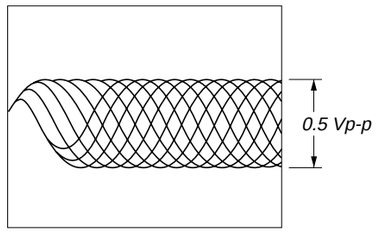
【PT BOARD】



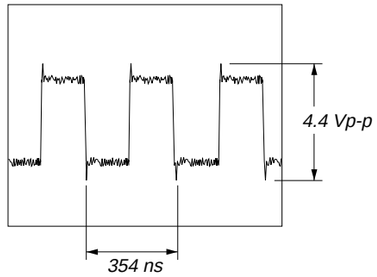
• **Waveforms**

– BD Board –

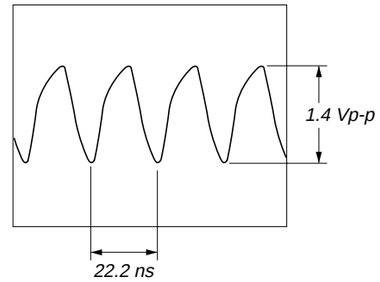
❶ IC101 ① (I), ② (J) (MD Play mode)



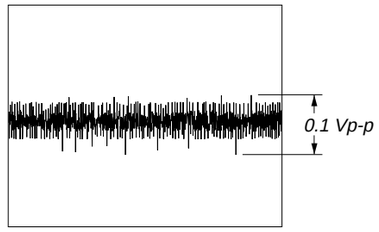
❻ IC151 ㉘ (XBCK)



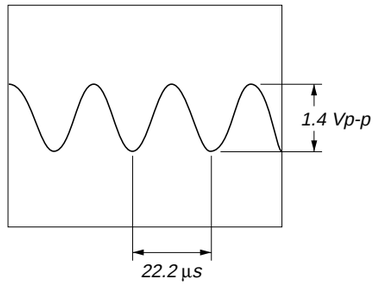
❸ IC500 ⑨ (XTI)



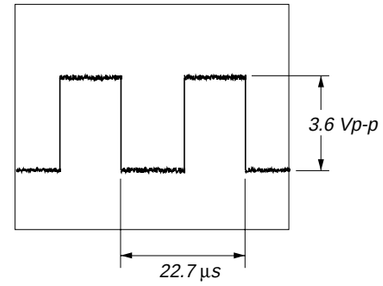
❷ IC101 ④ (A) (MD Play mode)



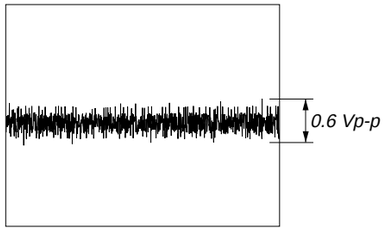
❼ IC171 ③



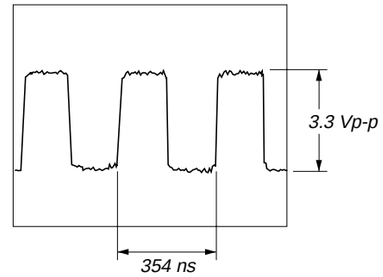
❹ IC500 ⑪ (LRCK)



❸ IC101 ⑧ (E), ⑨ (F) (MD Play mode)

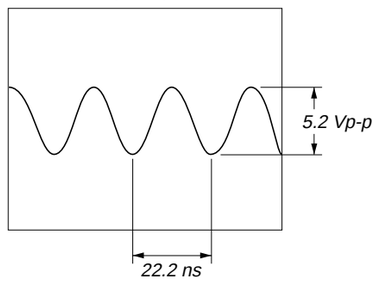


❺ IC500 ⑫ (BICK)

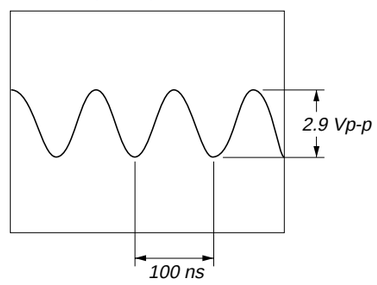


– MAIN Board –

❹ IC151 ⑯ (OSCI)

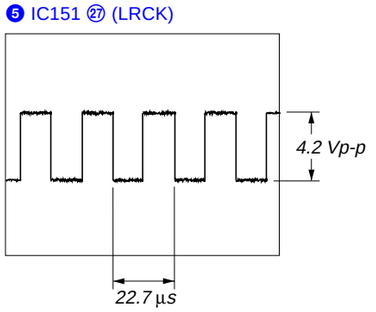


❶ IC1 ⑳ (XOUT)

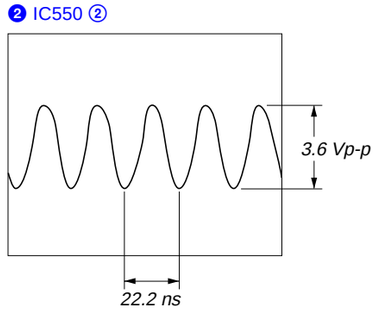


– DISPLAY Board –

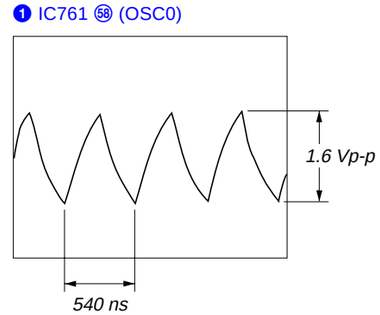
❺ IC151 ㉗ (LRCK)



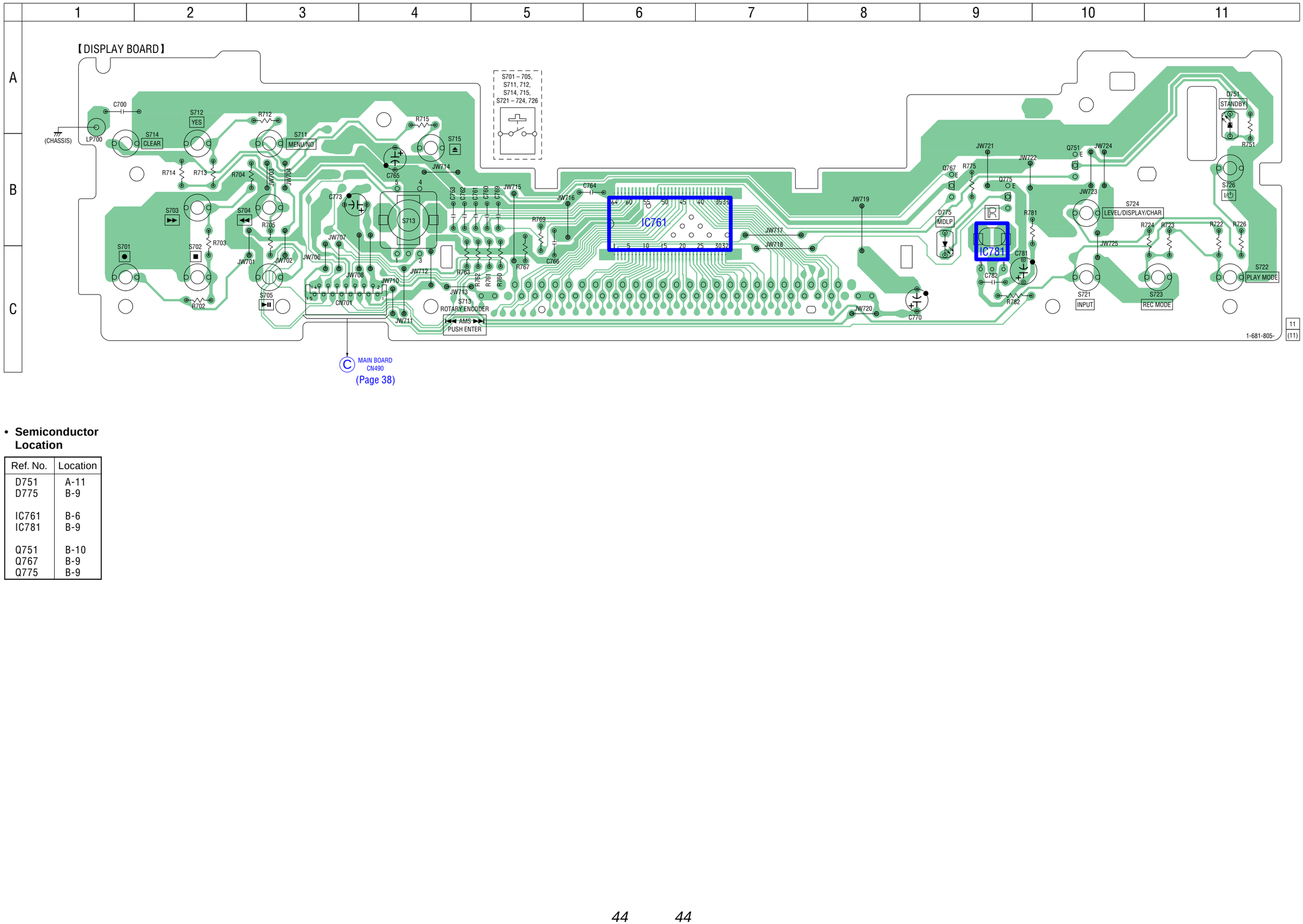
❷ IC550 ②



❶ IC761 ㊽ (OSC0)



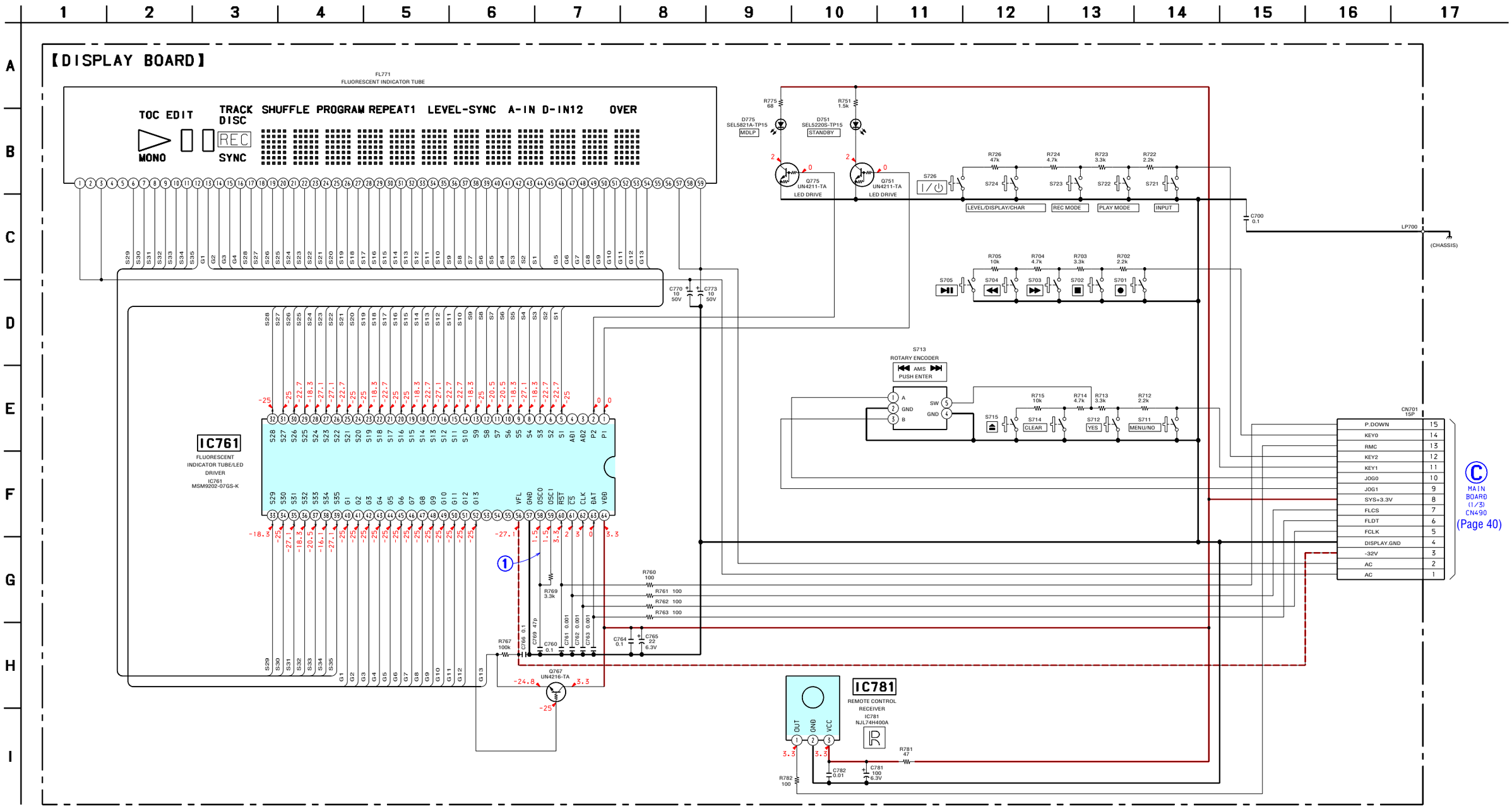
6-13. PRINTED WIRING BOARD – DISPLAY Board –



- **Semiconductor Location**

Ref. No.	Location
D751	A-11
D775	B-9
IC761	B-6
IC781	B-9
Q751	B-10
Q767	B-9
Q775	B-9

6-14. SCHEMATIC DIAGRAM – DISPLAY Board – • See page 43 for Waveform.



6-15. IC PIN FUNCTION DESCRIPTION

• BD 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 to the automatic power control circuit
12	APCREF	I	Reference voltage input for setting laser power from the CXD2662R (IC151)
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 CXD2662R (IC151)
17	SCLK	I	Serial data transfer clock signal input from the CXD2662R (IC151)
18	XLAT	I	Serial data latch pulse signal input from the CXD2662R (IC151)
19	XSTBY	I	Standby control 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 CXD2662R (IC151)
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 CXD2662R (IC151)
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 CXD2662R (IC151)
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 ± 1 kHz) output to the CXD2662R (IC151)
33	AUX	O	Auxiliary signal (I_3 signal/temperature signal) output to the CXD2662R (IC151)
34	FE	O	Focus error signal output to the CXD2662R (IC151)
35	ABCD	O	Light amount signal (ABCD) output to the CXD2662R (IC151)
36	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2662R (IC151)
37	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2662R (IC151)
38	RF	O	Playback EFM RF signal output to the CXD2662R (IC151)
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
47	MORFI	I	Receives a MO RF signal in AC coupling
48	MORFO	O	MO RF signal output

• BD BOARD IC151 CXD2662R (DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL 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 terminal “H” is output when focus is on (“L”: NG) Not used (open)
2	MNT1 (SHOCK)	O	Track jump detection signal output to the system controller (IC1)
3	MNT2 (XBUSY)	O	Busy monitor signal output to the system controller (IC1)
4	MNT3 (SLOCK)	O	Spindle servo lock status monitor signal output terminal Not used (open)
5	SWDT	I	Writing serial data signal input from the system controller (IC1)
6	SCLK	I (S)	Serial data transfer clock signal input from the system controller (IC1)
7	XLAT	I (S)	Serial data latch pulse signal input from the system controller (IC1)
8	SRDT	O (3)	Reading serial data signal output to the system controller (IC1)
9	SENS	O (3)	Internal status (SENSE) output to the system controller (IC1)
10	XRST	I (S)	Reset signal input from the system controller (IC1) “L”: reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system controller (IC1) “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 (IC1) “L” is output every 13.3 msec Almost all, “H” is output
13	RECP	I	Laser power selection signal input from the system controller (IC1) “L”: playback mode, “H”: recording mode
14	XINT	O	Interrupt status output to the system controller (IC1)
15	TX	O	Magnetic head on/off signal output to the over write head drive (IC181)
16	OSCI	I	System clock signal (512Fs=22.5792 MHz) input from the oscillator circuit
17	OSCO	O	System clock signal (512Fs=22.5792 MHz) output terminal Not used (open)
18	XTSL	I	Input terminal for the system clock frequency setting “L”: 22.5792 MHz, “H”: 45.1584 MHz (fixed at “L” 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 (for digital optical input) Not used
21	DOUT	O	Digital audio signal output terminal when playback mode (for digital optical output) Not used
22	DADTAI	I	Serial data input from the system controller (IC1)
23	LRCKI	I	L/R sampling clock signal (44.1 kHz) input from the system controller (IC1)
24	XBCKI	I	Bit clock signal (2.8224 MHz) input from the system controller (IC1)
25	ADDT	I	Recording data input from the A/D, D/A converter (IC500)
26	DADT	O	Playback data output to the A/D, D/A converter (IC500)
27	LRCK	O	L/R sampling clock signal (44.1 kHz) output to the A/D, D/A converter (IC500)
28	XBCK	O	Bit clock signal (2.8224 MHz) output to the A/D, D/A converter (IC500)
29	FS256	O	Clock signal (11.2896 MHz) output terminal Not used (open)
30	DVDD	—	Power supply terminal (+3.3V) (digital system)
31 to 34	A03 to A00	O	Address signal output to the D-RAM (IC153)
35	A10	O	Address signal output to the external D-RAM Not used (open)
36 to 40	A04 to A08	O	Address signal output to the D-RAM (IC153)
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 (IC153) “L” active
44	XCAS	O	Column address strobe signal output to the D-RAM (IC153) “L” active
45	A09	O	Address signal output to the D-RAM (IC153)
46	XRAS	O	Row address strobe signal output to the D-RAM (IC153) “L” active
47	XWE	O	Write enable signal output to the D-RAM (IC153) “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.

46

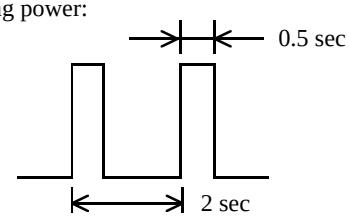
Pin No.	Pin Name	I/O	Description
48	D1	I/O	Two-way data bus with the D-RAM (IC153)
49	D0	I/O	
50	D2	I/O	
51	D3	I/O	
52	MVCI	I (S)	Digital in PLL oscillation input from the external VCO Not used (fixed at “L”)
53	ASYO	O	Playback EFM full-swing output terminal
54	ASYI	I (A)	Playback EFM asymmetry comparator 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_3 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	TEST4	I	Input terminal for the test Not used (fixed at “H”)
78	ADFG	I (S)	ADIP duplex FM signal (22.05 kHz ± 1 kHz) input from the CXA2523AR (IC101)
79	F0CNT	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	TEST0	O	Input terminal for the test Not used (open)
85	TRDR	O	Tracking servo drive PWM signal (–) output to the BH6519FS (IC141)
86	TFDR	O	Tracking servo drive PWM signal (+) output to the BH6519FS (IC141)
87	DVDD	—	Power supply terminal (+3.3V) (digital system)
88	FFDR	O	Focus servo drive PWM signal (+) output to the BH6519FS (IC141)
89	FRDR	O	Focus servo drive PWM signal (–) output to the BH6519FS (IC141)
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 BH6519FS (IC141)
92	SFDR	O	Sled servo drive PWM signal (+) output to the BH6519FS (IC141)
93	SPRD	O	Spindle servo drive PWM signal (–) output to the BH6519FS (IC141)

* 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
94	SPFD	O	Spindle servo drive PWM signal (+) output to the BH6519FS (IC141)
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 IC1 M30805MG-216GP (SYSTEM CONTROLLER)

Pin No.	Pin Name	I/O	Description
1	FL-DATA	O	Serial data output to the fluorescent indicator tube/LED driver (IC761)
2	FL-CLK	O	Serial data transfer clock signal output to the fluorescent indicator tube/LED driver (IC761)
3	A1 IN	I	Sircs remote control signal input terminal of the CONTROL A1II Not used (fixed at "H")
4	RMC	I	Remote control signal input from the remote control receiver (IC781)
5 to 7	NC	O	Not used (open)
8	$\overline{\text{MUTE}}$	O	Audio line muting on/off control signal output "L": line muting on, "H": line muting off
9	$\overline{\text{RESET}}$	O	Reset signal output to the A/D, D/A converter (IC500) "L": reset
10	LATCH	O	Serial data latch pulse signal output to the A/D, D/A converter (IC500)
11	LD-LOW	O	Loading motor drive voltage control signal output for the loading motor driver (IC440) "H" active
12	LDIN	O	Motor control signal output to the loading motor driver (IC440) "L" active *1
13	LDOUT	O	Motor control signal output to the loading motor driver (IC440) "L" active *1
14	MOD	O	Laser modulation selection signal output to the HF module switch circuit Stop: "L", Playback power: "H", Recording power: 
15	BYTE	I	External data bus line byte selection signal input "L": 16 bit, "H": 8 bit (fixed at "L")
16	CNVSS	—	Ground terminal
17	XCIN	I	Sub system clock input terminal (32.768 kHz) Not used (open)
18	XCOUT	O	Sub system clock output terminal (32.768 kHz) Not used (open)
19	$\overline{\text{RESET}}$	I	System reset signal input from the regulator (IC400) "L": reset For several hundreds msec. after the power supply rises, "L" is input, then it changes to "H"
20	XOUT	O	Main system clock output terminal (10 MHz)
21	VSS	—	Ground terminal
22	XIN	I	Main system clock input terminal (10 MHz)
23	VCC	—	Power supply terminal (+3.3V)
24	$\overline{\text{NMI}}$	I	Non-maskable interrupt input terminal "L" active (fixed at "H" in this set)
25	DQSY	I	Digital In U-bit CD format subcode Q sync (SCOR) input from the CXD2662R (IC151) "L" is input every 13.3 msec Almost all, "H" is input
26	$\overline{\text{PDOWN}}$	I	Power down detection signal input from the regulator (IC400) "L": power down, normally: "H"
27	SQSY	I	Subcode Q sync (SCOR) input from the CXD2662R (IC151) "L" is input every 13.3 msec Almost all, "H" is input
28	KEYBD-CLK	I	Serial data transfer clock signal input from the key board Not used (fixed at "H")
29	LDON	O	Laser diode on/off control signal output to the automatic power control circuit "H": laser on
30	LIMIT-IN	I	Detection signal input from the sled limit-in detect switch (S101) The optical pick-up is inner position when "L"
31	A1 OUT	O	Sircs remote control signal output terminal of the CONTROL A1II Not used (open)

*1 Loading motor (M103) control

Mode / Terminal	LOADING	EJECT	BRAKE	STOP
LDIN (pin ⑫)	"L"	"H"	"L"	"H"
LDOUT (pin ⑬)	"H"	"L"	"L"	"H"

Pin No.	Pin Name	I/O	Description
32	XINT	I	Interrupt status input from the CXD2662R (IC151)
33	BEEP	O	Beep sound drive signal and headphone muting on/off control signal output terminal Not used (open)
34	LRCKI	O	L/R sampling clock signal (44.1 kHz) output to the CXD2662R (IC151)
35	WRPWR	O	Laser power selection signal output to the CXD2662R (IC151) and HF module switch circuit "L": playback mode, "H": recording mode
36	I2CCLK	I/O	Serial data transfer clock signal input/output terminal for the IIC bus
37	I2CDAT	I/O	Serial data input/output terminal for the IIC bus
38	SWDT	O	Writing serial data signal output to the CXD2662R (IC151)
39	VCC	—	Power supply terminal (+3.3V)
40	SRDT	I	Reading serial data signal input from the CXD2662R (IC151)
41	VSS	—	Ground terminal
42	SCLK	O	Serial data transfer clock signal output to the CXD2662R (IC151)
43	REC-SW	I	Detection signal input from the recording position of over write head (HR901) detect switch (S105) "L" recording mode
44	TX0 (CLIP)	O	Serial data output to the CXD2662R (IC151)
45	RX0 (CLIP)	I	Serial data input
46	CLK (CLIP)	O	Bit clock signal (2.8224 MHz) output to the CXD2662R (IC151)
47	$\overline{\text{DIG-RST}}$	O	Reset signal output to the CXD2662R (IC151) and BH6519FS (IC141) "L": reset
48	SENS	I	Internal status (SENSE) input from the CXD2662R (IC151)
49	PLAY-SW	I	Detection signal input from the playback position of over write head (HR901) detect switch (S104) "L" playback mode
50	XLATCH	O	Serial data latch pulse signal output to the CXD2662R (IC151)
51	OUT-SW	I	Detection signal input from the loading-out detect switch (S103) "L" at a load-out position, others: "H"
52	$\overline{\text{RDY}}$	O	Not used (open)
53	ALE	O	Not used (open)
54	$\overline{\text{HOLD}}$	O	Not used (open)
55	$\overline{\text{HLDA}}$	O	Not used (open)
56	MNT2 (XBUSY)	I	Busy monitor signal input from the CXD2662R (IC151)
57	VSS	—	Ground terminal
58	MNT1 (SHOCK)	I	Track jump detection signal input from the CXD2662R (IC151)
59	VCC	—	Power supply terminal (+3.3V)
60	EEP-WP	O	Writing protect signal output to the EEPROM (IC195)
61	SDA	I/O	Two-way data bus with the EEPROM (IC195)
62	BCLK	O	Not used (open)
63	$\overline{\text{OE}}$	O	Data reading strobe signal output to the flash memory "L" active Not used (open)
64	$\overline{\text{BHE}}$	O	Not used (open)
65	$\overline{\text{WE}}$	O	Writing enable signal output to the flash memory "L" active Not used (open)
66	SCL	O	Clock signal output to the EEPROM (IC195)
67	REFLECT SW	I	Detection signal input from the disc reflection rate detect switch (S102-1) "L": high reflection rate disc, "H": low reflection rate disc
68	PROTECT SW	I	REC-proof claw detection signal input from the protect detect switch (S102-2) "H": write protect
69 to 71	$\overline{\text{CS0}}$ to $\overline{\text{CS2}}$	O	Chip select signal output to the flash memory "L" active Not used (open)
72, 73	A20, A19	O	Address signal output to the flash memory Not used (open)
74	VCC	—	Power supply terminal (+3.3V)
75	A18	O	Address signal output to the flash memory Not used (open)

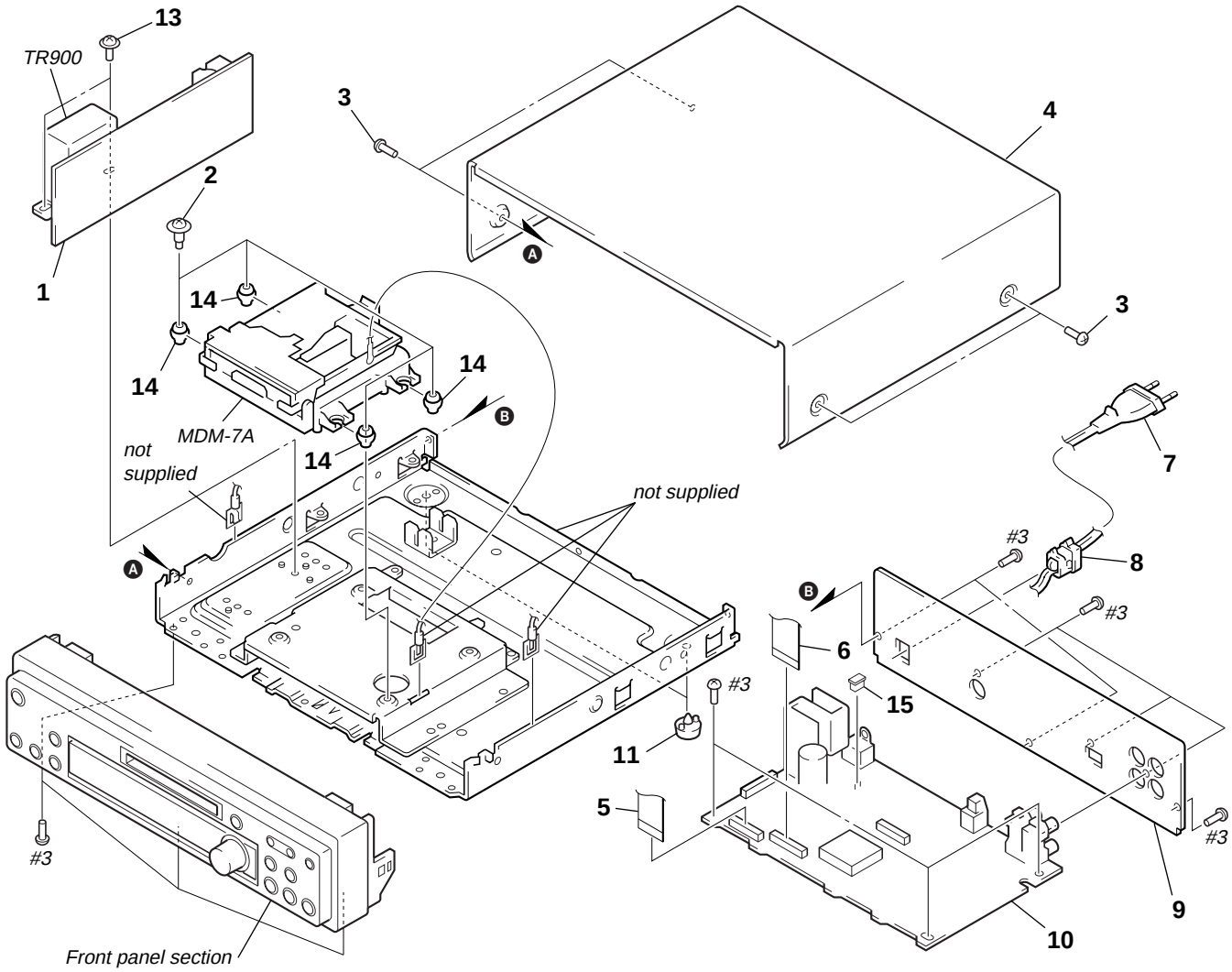
Pin No.	Pin Name	I/O	Description
76	VSS	—	Ground terminal
77 to 85	A17 to A9	O	Address signal output to the flash memory Not used (open)
86 to 89	SEL1 to SEL4	I	Not used (open)
90	$\overline{WP}$	O	Writing protect signal output to the flash memory "L" active Not used (fixed at "L")
91	VCC	—	Power supply terminal (+3.3V)
92	A8	O	Address signal output to the flash memory Not used (open)
93	VSS	—	Ground terminal
94 to 101	A7 to A0	O	Address signal output to the flash memory Not used (open)
102 to 113	D15 to D4	I/O	Two-way data bus with the flash memory Not used (open)
114	KEYBD-CLKCTL	O	Clock control signal output to the key board Not used (pull down)
115	I2CBUSY	I	Busy monitor signal input from the IIC bus
116	KEYBD-DAT	I	Serial data input from the key board Not used (fixed at "H")
117	REC VOL A	O	Not used (open)
118	REC VOL B	O	Not used (open)
119 to 122	D3 to D0	I/O	Two-way data bus with the flash memory Not used (open)
123	JOG0	I	JOG dial pulse input from the rotary encoder (S713 ⏮ AMS ⏭) (A phase input)
124	JOG1	I	JOG dial pulse input from the rotary encoder (S713 ⏮ AMS ⏭) (B phase input)
125	LATCH	O	Not used (open)
126	REC	O	Power on/off control signal output terminal for the beep sound drive Not used (open)
127	COAX/OPT	O	Optical in or coaxial in selection signal output terminal "L": optical in, "H": coaxial in Not used (open)
128	FL-CS	O	Chip select signal output to the fluorescent indicator tube/LED driver (IC761)
129	I2CPOWER	I	Power supply detection signal input from the IIC bus
130	VSS	—	Ground terminal
131	STB	O	Relay drive signal output for the power on/off "L": standby, "H": power on
132	VCC	—	Power supply terminal (+3.3V)
133	IOP	I	Optical pick-up voltage detection signal input from the automatic power control circuit
134	DESTINATION	I	Destination setting input terminal Fixed at "L" in this set
135	MODEL	I	Model setting input terminal Fixed at "M" in this set
136	BEEP SW	I	Beep switch input terminal Not used (fixed at "L")
137	KEY3	I	Key input terminal (A/D input) Not used (fixed at "H")
138	KEY2	I	Key input terminal (A/D input) S721 to S724 and S726 (INPUT, PLAY MODE, REC MODE, LEVEL/DISPLAY/CHAR, I/⏻) keys input
139	KEY1	I	Key input terminal (A/D input) S711 to S715 (MENU/NO, YES, PUSH ENTER, CLEAR, ⏏) keys input
140	AVSS	—	Ground terminal (for analog system)
141	KEY0	I	Key input terminal (A/D input) S701 to S705 (●, ■, ▶▶, ◀◀, ▶II) keys input
142	VREF	I	Reference voltage (+3.3V) input terminal (for A/D converter)
143	AVCC	—	Power supply terminal (+3.3V) (for analog system)
144	NC	O	Not used (pull down)

SECTION 7
EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

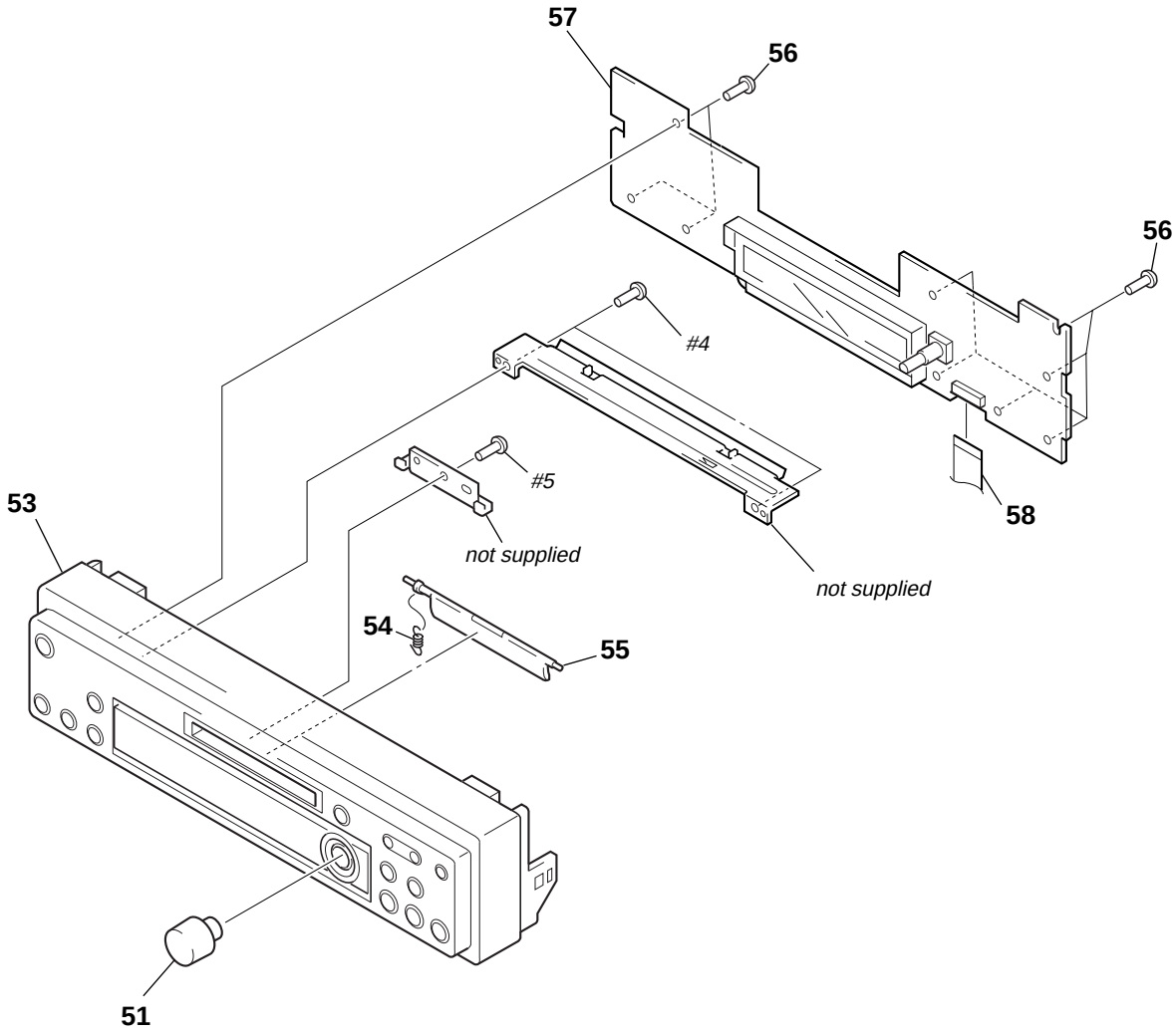
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

7-1. CASE SECTION



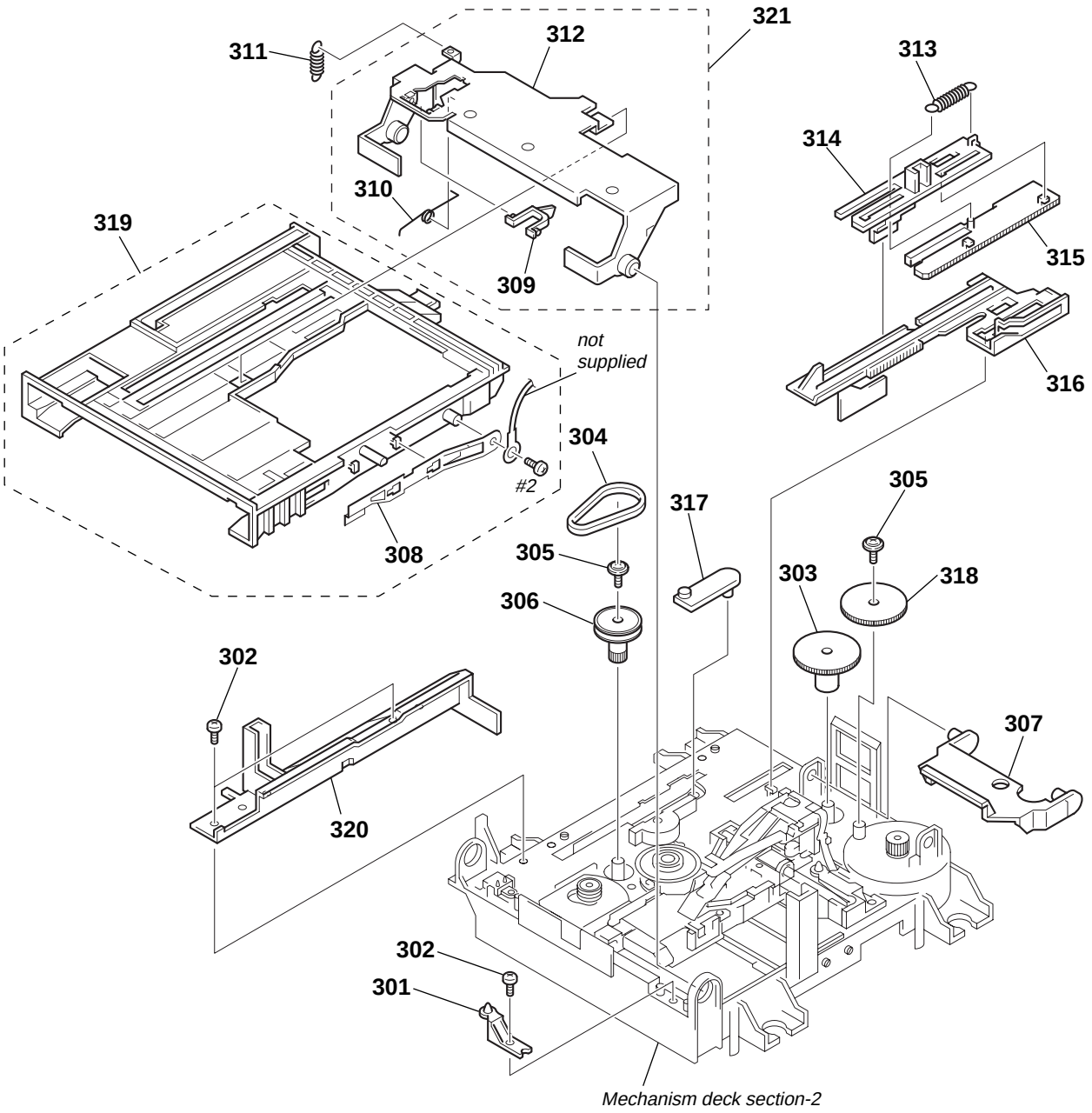
Ref. No.	Part No.	Description	Remark
1	1-681-806-11	PT BOARD	
2	4-228-643-11	SCREW (+BVTTWH M3), STEP	
3	3-363-099-21	SCREW (CASE 3 TP2)	
4	4-229-363-51	CASE	
5	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)	
6	1-792-812-11	WIRE (FLAT TYPE) (27 CORE)	
⚠7	1-777-071-61	CORD, POWER	
* 8	3-703-244-00	BUSHING (2104), CORD	
9	4-235-438-01	PANEL, BACK	
10	A-4726-240-A	MAIN BOARD, COMPLETE	
11	4-965-822-01	FOOT	
13	4-221-887-11	SCREW, +PTTWH (M3) (S) TITE	
14	4-228-689-01	INSULATOR	
* 15	1-569-972-21	SOCKET, SHORT 2P	
⚠TR900	1-435-544-11	TRANSFORMER, POWER	

7-2. FRONT PANEL SECTION



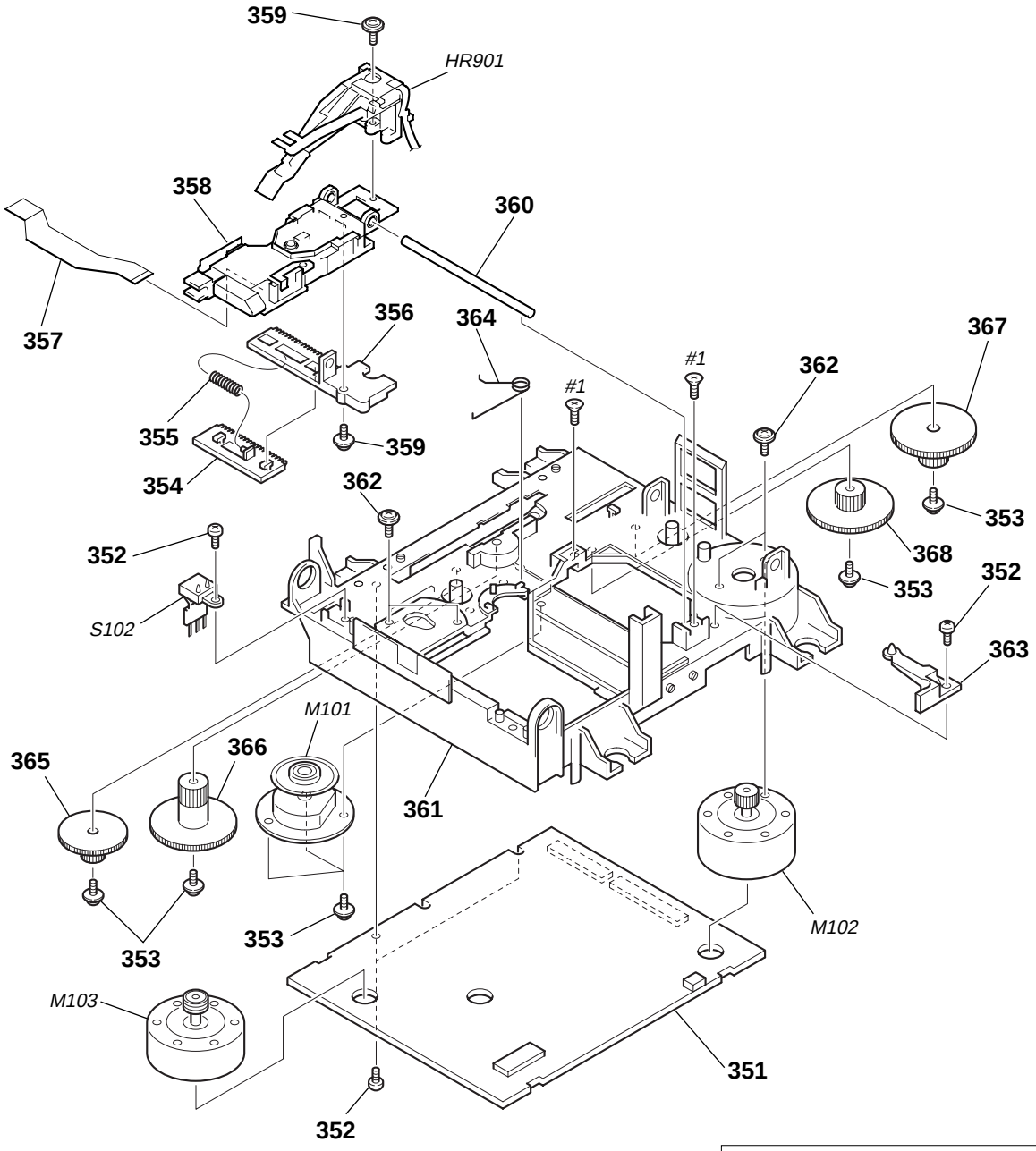
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-235-123-01	KNOB (AMS)		55	4-228-629-62	LID (MD)	
53	X-4953-948-1	PANEL ASSY, FRONT		57	A-4726-238-A	DISPLAY BOARD, COMPLETE	
54	4-228-630-01	SPRING (LID), TENSION COIL		58	1-792-813-11	WIRE (FLAT TYPE) (15 CORE)	

7-3. MECHANISM DECK SECTION-1 (MDM-7A)



Ref. No.	Part No.	Description	Remark
* 301	4-996-267-01	BASE (BU-D)	
302	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI	
303	4-227-007-01	GEAR (SB)	
304	4-227-025-01	BELT (LOADING)	
305	3-372-761-01	SCREW (M1.7), TAPPING	
306	4-227-002-01	GEAR, PULLEY	
307	4-226-999-01	LEVER (HEAD)	
308	X-4952-665-1	SPRING (SHT) ASSY, LEAF	
309	A-4680-638-A	LOCK (HOLDER)	
310	4-229-533-02	SPRING (STOPPER), TORSION	
311	4-227-012-01	SPRING (HOLDER), TENSION	
312	4-227-019-03	PLATE (HOLDER) ASSY, RETAINER	
313	4-227-013-01	SPRING (EJ), TENSION	
314	4-226-995-01	SLIDER (EJ)	
315	4-226-996-03	LIMITTER (EJ)	
316	4-226-997-04	SLIDER	
317	4-226-998-01	LEVER (CHG)	
318	4-227-006-01	GEAR (SA)	
319	A-4735-075-A	HOLDER ASSY	
320	4-226-994-01	GUIDE (L)	
321	A-4680-638-B	RETAINER COMPLETE ASSY	

7-4. MECHANISM DECK SECTION-2 (MDM-7A)



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

Ref. No.	Part No.	Description	Remark
351	A-4725-471-A	BD BOARD, COMPLETE	
352	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI	
353	3-372-761-01	SCREW (M1.7), TAPPING	
354	4-226-993-01	RACK	
355	4-227-014-01	SPRING (RACK), COMPRESSION	
356	4-226-992-01	BASE, SL	
357	1-678-514-11	FLEXIBLE, BOARD	
⚠358	A-4672-541-A	OPTICS ASSY (KMS-260B)	
359	4-988-560-01	SCREW (+P 1.7X6)	
360	4-996-265-01	SHAFT, MAIN	
361	4-226-989-01	CHASSIS	
362	4-232-270-01	SCREW (1.7X3.5), +PWH	
363	4-226-990-01	BASE (BU-A)	
364	4-227-023-01	SPRING (SPINDLE), TORSION	
365	4-227-004-01	GEAR (LC)	
366	4-227-005-01	GEAR (LD)	
367	4-227-008-01	GEAR (SC)	
368	4-227-009-01	GEAR (SD)	
HR901	1-500-670-11	HEAD, OVER WRITE	
M101	A-4672-898-A	MOTOR ASSY, SPINDLE	
M102	A-4735-076-A	MOTOR ASSY, SLED	
M103	A-4735-074-A	MOTOR ASSY, LOADING	
S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT RATE DETECT, PROTECT DETECT)	

SECTION 8
ELECTRICAL PARTS LIST

BD

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: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

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

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

Ref. No.	Part No.	Description			Remark
	A-4725-471-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C102	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C105	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C106	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C107	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C108	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C109	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C110	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C111	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C112	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C113	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C114	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C115	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C116	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C117	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C119	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C120	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C121	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C125	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C131	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C132	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C133	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C141	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C142	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C143	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C144	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C145	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C151	1-117-370-11	CERAMIC CHIP	10uF		10V
C152	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C153	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C154	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C155	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C156	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C157	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C158	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C159	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C160	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C161	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C162	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C163	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C164	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C165	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C166	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C167	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C169	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C171	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C172	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C180	1-117-370-11	CERAMIC CHIP	10uF		10V
C181	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C182	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C183	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C184	1-117-970-11	ELECT CHIP	22uF	20%	10V
C185	1-131-872-11	CERAMIC CHIP	1000PF	10%	630V
C191	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C192	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C193	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C194	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C195	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C196	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C1401	1-117-720-11	CERAMIC CHIP	4.7uF		10V
		< CONNECTOR >			
CN101	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN102	1-784-835-21	CONNECTOR, FFC (LIF (NON-ZIF)) 27P			
CN103	1-784-834-21	CONNECTOR, FFC (LIF (NON-ZIF)) 23P			
* CN104	1-580-055-21	PIN, CONNECTOR (SMD) 2P			
CN105	1-784-859-21	CONNECTOR, FFC (LIF (NON-ZIF)) 7P			
		< DIODE >			
D101	8-719-988-61	DIODE 1SS355TE-17			
D181	8-719-080-81	DIODE FS1J6			
D183	8-719-080-81	DIODE FS1J6			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			
IC102	8-759-473-51	IC TLV2361CDBV			
IC141	8-759-836-79	IC BH6519FS-E2			
IC151	8-752-404-64	IC CXD2662R			
IC153	8-759-671-27	IC MSM51V4400E-70TS-K			

Ref. No.	Part No.	Description			Remark
IC171	8-759-096-87	IC TC7WU04FU (TE12R)			
IC181	8-759-481-17	IC MC74ACT08DTR2			
IC190	8-759-460-72	IC BA033FP-E2			
IC195	8-759-640-41	IC BR24C08F-E2			
		< SHORT >			
JW201	1-216-295-11	SHORT	0		
JW202	1-216-295-11	SHORT	0		
JW203	1-216-295-11	SHORT	0		
JW903	1-216-295-11	SHORT	0		
JW904	1-216-295-11	SHORT	0		
		< FERRITE BEAD/SHORT >			
L101	1-500-245-11	FERRITE	0uH		
L102	1-500-245-11	FERRITE	0uH		
L103	1-500-245-11	FERRITE	0uH		
L105	1-414-235-22	FERRITE	0uH		
L106	1-500-245-11	FERRITE	0uH		
L121	1-500-245-11	FERRITE	0uH		
L122	1-500-245-11	FERRITE	0uH		
L131	1-500-245-11	FERRITE	0uH		
L141	1-216-296-11	SHORT	0		
L142	1-216-296-11	SHORT	0		
L143	1-216-296-11	SHORT	0		
L144	1-216-296-11	SHORT	0		
L145	1-216-296-11	SHORT	0		
L146	1-469-855-21	FERRITE	0uH		
L147	1-469-855-21	FERRITE	0uH		
L161	1-500-245-11	FERRITE	0uH		
L171	1-500-245-11	FERRITE	0uH		
L180	1-469-855-21	FERRITE	0uH		
L181	1-469-855-21	FERRITE	0uH		
L182	1-500-245-11	FERRITE	0uH		
L183	1-216-296-11	SHORT	0		
L184	1-216-296-11	SHORT	0		
		< TRANSISTOR >			
Q101	8-729-403-35	TRANSISTOR	UN5113		
Q121	8-729-403-35	TRANSISTOR	UN5113		
Q122	8-729-101-07	TRANSISTOR	2SB798-DL		
Q131	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR		
Q132	8-729-903-10	TRANSISTOR	FMW1		
Q133	8-729-402-93	TRANSISTOR	UN5214		
Q134	8-729-402-93	TRANSISTOR	UN5214		
Q181	8-729-018-75	FET	2SJ278MY		
Q182	8-729-017-65	FET	2SK1764KY		
		< RESISTOR >			
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R102	1-216-853-11	METAL CHIP	470K	5%	1/16W
R103	1-216-863-11	RES-CHIP	3.3M	5%	1/16W
R104	1-216-853-11	METAL CHIP	470K	5%	1/16W
R105	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R106	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R107	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R108	1-216-833-11	METAL CHIP	10K	5%	1/16W
R109	1-216-845-11	METAL CHIP	100K	5%	1/16W
R110	1-216-845-11	METAL CHIP	100K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R111	1-216-833-11	METAL CHIP	10K	5%	1/16W
R112	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R113	1-216-833-11	METAL CHIP	10K	5%	1/16W
R114	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W
R116	1-216-839-11	METAL CHIP	33K	5%	1/16W
R117	1-216-837-11	METAL CHIP	22K	5%	1/16W
R118	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R119	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R120	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R121	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R122	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R123	1-216-819-11	METAL CHIP	680	5%	1/16W
R124	1-216-809-11	METAL CHIP	100	5%	1/16W
R125	1-216-815-11	METAL CHIP	330	5%	1/16W
R126	1-216-819-11	METAL CHIP	680	5%	1/16W
R127	1-216-845-11	METAL CHIP	100K	5%	1/16W
R128	1-219-724-11	METAL CHIP	1	1%	1/4W
R129	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R130	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R131	1-216-833-11	METAL CHIP	10K	5%	1/16W
R132	1-216-841-11	METAL CHIP	47K	5%	1/16W
R133	1-216-821-11	METAL CHIP	1K	5%	1/16W
R134	1-216-821-11	METAL CHIP	1K	5%	1/16W
R135	1-216-821-11	METAL CHIP	1K	5%	1/16W
R136	1-216-295-11	SHORT	0		
R138	1-216-833-11	METAL CHIP	10K	5%	1/16W
R150	1-216-833-11	METAL CHIP	10K	5%	1/16W
R151	1-216-833-11	METAL CHIP	10K	5%	1/16W
R154	1-216-833-11	METAL CHIP	10K	5%	1/16W
R155	1-216-864-11	METAL CHIP	0	5%	1/16W
R156	1-216-864-11	METAL CHIP	0	5%	1/16W
R157	1-216-809-11	METAL CHIP	100	5%	1/16W
R158	1-216-809-11	METAL CHIP	100	5%	1/16W
R159	1-216-833-11	METAL CHIP	10K	5%	1/16W
R160	1-216-833-11	METAL CHIP	10K	5%	1/16W
R161	1-216-833-11	METAL CHIP	10K	5%	1/16W
R163	1-216-809-11	METAL CHIP	100	5%	1/16W
R164	1-216-809-11	METAL CHIP	100	5%	1/16W
R165	1-216-809-11	METAL CHIP	100	5%	1/16W
R167	1-216-833-11	METAL CHIP	10K	5%	1/16W
R168	1-216-845-11	METAL CHIP	100K	5%	1/16W
R169	1-216-855-11	METAL CHIP	680K	5%	1/16W
R170	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R171	1-216-821-11	METAL CHIP	1K	5%	1/16W
R173	1-216-821-11	METAL CHIP	1K	5%	1/16W
R174	1-216-811-11	METAL CHIP	150	5%	1/16W
R175	1-216-857-11	METAL CHIP	1M	5%	1/16W
R176	1-216-809-11	METAL CHIP	100	5%	1/16W
R179	1-216-295-11	SHORT	0		
R181	1-216-841-11	METAL CHIP	47K	5%	1/16W
R182	1-216-841-11	METAL CHIP	47K	5%	1/16W
R183	1-216-841-11	METAL CHIP	47K	5%	1/16W
R184	1-220-942-11	METAL CHIP	3.3	1%	1/4W
R185	1-220-942-11	METAL CHIP	3.3	1%	1/4W
R195	1-216-833-11	METAL CHIP	10K	5%	1/16W
R196	1-216-833-11	METAL CHIP	10K	5%	1/16W
R197	1-216-833-11	METAL CHIP	10K	5%	1/16W

BD DISPLAY MAIN

Ref. No.	Part No.	Description			Remark
R218	1-216-864-11	METAL CHIP	0	5%	1/16W
		< SWITCH >			
S101	1-762-596-21	SWITCH, PUSH (1 KEY) (LIMIT IN)			
S103	1-771-956-21	SWITCH, PUSH (1 KEY) (PACK OUT)			
S104	1-771-955-21	SWITCH, PUSH (1 KEY) (PLAY POSITION)			
S105	1-771-955-21	SWITCH, PUSH (1 KEY) (REC POSITION)			
**********					
	A-4726-238-A	DISPLAY BOARD, COMPLETE			
		**********			
	4-212-590-22	HOLDER (FL)			
*	4-949-935-31	CUSHION (FL)			
		< CAPACITOR >			
C700	1-164-159-11	CERAMIC	0.1uF		50V
C760	1-164-159-11	CERAMIC	0.1uF		50V
C761	1-162-294-31	CERAMIC	0.001uF	10%	50V
C762	1-162-294-31	CERAMIC	0.001uF	10%	50V
C763	1-162-294-31	CERAMIC	0.001uF	10%	50V
C764	1-164-159-11	CERAMIC	0.1uF		50V
C765	1-126-153-11	ELECT	22uF	20%	6.3V
C766	1-164-159-11	CERAMIC	0.1uF		50V
C769	1-162-215-31	CERAMIC	47PF	5%	50V
C770	1-124-261-00	ELECT	10uF	20%	50V
C773	1-124-261-00	ELECT	10uF	20%	50V
C781	1-124-584-00	ELECT	100uF	20%	10V
C782	1-162-306-11	CERAMIC	0.01uF	20%	16V
		< CONNECTOR >			
CN701	1-779-552-21	CONNECTOR, FFC (LIF (NON-ZIF)) 15P			
		< LED >			
D751	8-719-812-44	LED TL0124 (STANDBY)			
D775	8-719-046-39	LED SEL5821A-TP15 (MDLP)			
		< FLUORESCENT INDICATOR TUBE >			
FL771	1-517-986-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC761	8-759-659-03	IC MSM9202-07GS-K			
IC781	8-759-826-34	IC NJL74H400A (REMOTE CONTROL RECEIVER)			
		< TRANSISTOR >			
Q751	8-729-900-80	TRANSISTOR	DTC114ES		
Q767	8-729-900-74	TRANSISTOR	DTC143TS		
Q775	8-729-900-80	TRANSISTOR	DTC114ES		
		< RESISTOR >			
R702	1-249-421-11	CARBON	2.2K	5%	1/4W
R703	1-247-843-11	CARBON	3.3K	5%	1/4W
R704	1-249-425-11	CARBON	4.7K	5%	1/4W
R705	1-249-429-11	CARBON	10K	5%	1/4W
R712	1-249-421-11	CARBON	2.2K	5%	1/4W
R713	1-247-843-11	CARBON	3.3K	5%	1/4W
R714	1-249-425-11	CARBON	4.7K	5%	1/4W

Ref. No.	Part No.	Description			Remark
R715	1-249-429-11	CARBON	10K	5%	1/4W
R722	1-249-421-11	CARBON	2.2K	5%	1/4W
R723	1-247-843-11	CARBON	3.3K	5%	1/4W
R724	1-249-425-11	CARBON	4.7K	5%	1/4W
R726	1-249-437-11	CARBON	47K	5%	1/4W
R751	1-249-409-11	CARBON	220	5%	1/4W
R760	1-247-807-31	CARBON	100	5%	1/4W
R761	1-247-807-31	CARBON	100	5%	1/4W
R762	1-247-807-31	CARBON	100	5%	1/4W
R763	1-247-807-31	CARBON	100	5%	1/4W
R767	1-249-441-11	CARBON	100K	5%	1/4W
R769	1-247-843-11	CARBON	3.3K	5%	1/4W
R775	1-249-409-11	CARBON	220	5%	1/4W
R781	1-249-401-11	CARBON	47	5%	1/4W
R782	1-247-807-31	CARBON	100	5%	1/4W
		< SWITCH/ROTARY ENCODER >			
S701	1-762-875-21	SWITCH, KEYBOARD (●)			
S702	1-762-875-21	SWITCH, KEYBOARD (■)			
S703	1-762-875-21	SWITCH, KEYBOARD (▶▶)			
S704	1-762-875-21	SWITCH, KEYBOARD (◀◀)			
S705	1-762-875-21	SWITCH, KEYBOARD (▶II)			
S711	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)			
S712	1-762-875-21	SWITCH, KEYBOARD (YES)			
S713	1-475-543-11	ENCODER, ROTARY (I◀◀ AMS ▶▶I, PUSH ENTER)			
S714	1-762-875-21	SWITCH, KEYBOARD (CLEAR)			
S715	1-762-875-21	SWITCH, KEYBOARD (⏏)			
S721	1-762-875-21	SWITCH, KEYBOARD (INPUT)			
S722	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE)			
S723	1-762-875-21	SWITCH, KEYBOARD (REC MODE)			
S724	1-762-875-21	SWITCH, KEYBOARD (LEVEL/DISPLAY/CHAR)			
S726	1-762-875-21	SWITCH, KEYBOARD (I/⏻)			
**********					
	A-4726-240-A	MAIN BOARD, COMPLETE			
		**********			
	7-685-546-19	SCREW +BTP 3X8 TYPE2 N-S			
		< CAPACITOR >			
C1	1-126-964-11	ELECT	10uF	20%	50V
C19	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C26	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C36	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C37	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C39	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C48	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C151	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C152	1-128-551-11	ELECT	22uF	20%	25V
C153	1-128-551-11	ELECT	22uF	20%	25V
C161	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C165	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C166	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C171	1-137-368-11	MYLAR	0.0047uF	5%	50V
C172	1-130-471-00	MYLAR	0.001uF	5%	50V
C176	1-128-551-11	ELECT	22uF	20%	25V
C177	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C251	1-164-315-11	CERAMIC CHIP	470PF	5%	50V

MAIN

Ref. No.	Part No.	Description			Remark
C252	1-128-551-11	ELECT	22uF	20%	25V
C253	1-128-551-11	ELECT	22uF	20%	25V
C261	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C265	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C266	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C271	1-137-368-11	MYLAR	0.0047uF	5%	50V
C272	1-130-471-00	MYLAR	0.001uF	5%	50V
C276	1-128-551-11	ELECT	22uF	20%	25V
C277	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C312	1-126-916-11	ELECT	1000uF	20%	6.3V
C351	1-104-665-11	ELECT	100uF	20%	25V
C356	1-104-665-11	ELECT	100uF	20%	25V
C361	1-104-665-11	ELECT	100uF	20%	25V
C366	1-104-665-11	ELECT	100uF	20%	25V
C400	1-126-939-11	ELECT	10000uF	20%	16V
C403	1-126-963-11	ELECT	4.7uF	20%	50V
C404	1-126-934-11	ELECT	220uF	20%	10V
C405	1-126-916-11	ELECT	1000uF	20%	6.3V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C407	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C408	1-104-665-11	ELECT	100uF	20%	10V
C410	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C411	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C412	1-126-963-11	ELECT	4.7uF	20%	50V
C413	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C431	1-104-663-11	ELECT	33uF	20%	25V
C443	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C447	1-104-665-11	ELECT	100uF	20%	25V
C461	1-126-939-11	ELECT	10000uF	20%	16V
C471	1-126-935-11	ELECT	470uF	20%	16V
C476	1-126-935-11	ELECT	470uF	20%	16V
C481	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C482	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C483	1-128-576-11	ELECT	100uF	20%	63V
C484	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C485	1-126-967-11	ELECT	47uF	20%	50V
C490	1-126-965-11	ELECT	22uF	20%	50V
C500	1-126-934-11	ELECT	220uF	20%	10V
C501	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C502	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C503	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C504	1-104-665-11	ELECT	100uF	20%	10V
C505	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C515	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C516	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C517	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C519	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C520	1-126-934-11	ELECT	220uF	20%	10V
C522	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C523	1-104-665-11	ELECT	100uF	20%	10V
C524	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C550	1-104-665-11	ELECT	100uF	20%	10V
C551	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C552	1-162-912-11	CERAMIC CHIP	7PF	0.5PF	50V
C553	1-162-912-11	CERAMIC CHIP	7PF	0.5PF	50V
C554	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C601	1-164-156-11	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
C611	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C612	1-126-963-11	ELECT	4.7uF	20%	50V
C613	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C804	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C814	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C925	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C926	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C955	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C956	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN1	1-784-384-11	CONNECTOR, FFC/FPC 27P			
CN400	1-793-991-11	CONNECTOR, FFC/FPC 23P			
CN420	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P			
CN490	1-784-374-21	CONNECTOR, FFC/FPC 15P			
* CN902	1-764-333-11	PLUG, CONNECTOR 10P			
		< DIODE >			
D155	8-719-988-61	DIODE 1SS355TE-17			
D156	8-719-988-61	DIODE 1SS355TE-17			
D255	8-719-988-61	DIODE 1SS355TE-17			
D256	8-719-988-61	DIODE 1SS355TE-17			
D401	8-719-081-08	DIODE EP05Q04-TE8L3			
D402	8-719-081-08	DIODE EP05Q04-TE8L3			
D403	8-719-081-08	DIODE EP05Q04-TE8L3			
D404	8-719-081-08	DIODE EP05Q04-TE8L3			
D412	8-719-820-05	DIODE 1SS181			
D421	8-719-988-61	DIODE 1SS355TE-17			
D422	8-719-074-34	DIODE RB495D-T146			
D431	8-719-988-61	DIODE 1SS355TE-17			
D432	8-719-988-61	DIODE 1SS355TE-17			
D461	8-719-200-82	DIODE 11ES2			
D462	8-719-200-82	DIODE 11ES2			
D471	8-719-200-82	DIODE 11ES2			
D472	8-719-200-82	DIODE 11ES2			
D476	8-719-200-82	DIODE 11ES2			
D477	8-719-200-82	DIODE 11ES2			
D481	8-719-200-82	DIODE 11ES2			
D482	8-719-422-23	DIODE MA8047			
		< SHORT/CAPACITOR >			
FB801	1-216-295-11	SHORT	0		
FB803	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< IC >			
IC1	6-800-334-01	IC M30805MG-216GP			
IC160	8-759-100-96	IC uPC4558G2			
IC260	8-759-100-96	IC uPC4558G2			
IC350	8-759-100-96	IC uPC4558G2			
IC400	8-759-678-77	IC LA5643			
IC440	8-759-822-09	IC LB1641			
IC480	8-759-633-42	IC M5293L			
IC500	8-759-579-68	IC AK4524			
IC550	8-759-548-87	IC SN74LVU04ANSR			
IC600	8-759-548-87	IC SN74LVU04ANSR			
IC611	8-749-012-70	IC GP1F38R (DIGITAL IN)			

MAIN

Ref. No.	Part No.	Description			Remark
		< JACK/CONNECTOR >			
J150	1-784-429-11	JACK, PIN 4P (ANALOG IN/OUT)			
J800	1-580-394-11	CONNECTOR, DIN 6P (PC LINK)			
		< SHORT/COIL >			
L349	1-216-296-11	SHORT	0		
L490	1-216-295-11	SHORT	0		
L506	1-216-295-11	SHORT	0		
L522	1-216-295-11	SHORT	0		
L523	1-216-295-11	SHORT	0		
L524	1-216-296-11	SHORT	0		
L550	1-216-295-11	SHORT	0		
L551	1-216-296-11	SHORT	0		
L611	1-414-267-21	INDUCTOR	10uH		
L804	1-414-265-21	INDUCTOR	4.7uH		
		< TRANSISTOR >			
Q180	8-729-046-97	TRANSISTOR	2SD1938 (F) -T (TX).SO		
Q281	8-729-046-97	TRANSISTOR	2SD1938 (F) -T (TX).SO		
Q356	8-729-194-57	TRANSISTOR	2SC945-P		
Q380	8-729-424-08	TRANSISTOR	UN2111		
Q440	8-729-421-22	TRANSISTOR	UN2211		
Q444	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR		
Q910	8-729-922-37	TRANSISTOR	2SD2144S-UVW		
		< RESISTOR >			
R3	1-216-809-11	METAL CHIP	100	5%	1/16W
R4	1-216-864-11	METAL CHIP	0	5%	1/16W
R10	1-216-864-11	METAL CHIP	0	5%	1/16W
R16	1-216-845-11	METAL CHIP	100K	5%	1/16W
R24	1-216-833-11	METAL CHIP	10K	5%	1/16W
R28	1-216-833-11	METAL CHIP	10K	5%	1/16W
R30	1-216-833-11	METAL CHIP	10K	5%	1/16W
R33	1-216-864-11	METAL CHIP	0	5%	1/16W
R36	1-216-864-11	METAL CHIP	0	5%	1/16W
R37	1-216-864-11	METAL CHIP	0	5%	1/16W
R38	1-216-864-11	METAL CHIP	0	5%	1/16W
R42	1-216-864-11	METAL CHIP	0	5%	1/16W
R43	1-216-833-11	METAL CHIP	10K	5%	1/16W
R44	1-216-864-11	METAL CHIP	0	5%	1/16W
R45	1-216-833-11	METAL CHIP	10K	5%	1/16W
R49	1-216-833-11	METAL CHIP	10K	5%	1/16W
R50	1-216-864-11	METAL CHIP	0	5%	1/16W
R51	1-216-833-11	METAL CHIP	10K	5%	1/16W
R67	1-216-833-11	METAL CHIP	10K	5%	1/16W
R68	1-216-833-11	METAL CHIP	10K	5%	1/16W
R90	1-216-845-11	METAL CHIP	100K	5%	1/16W
R114	1-216-845-11	METAL CHIP	100K	5%	1/16W
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W
R116	1-216-833-11	METAL CHIP	10K	5%	1/16W
R123	1-216-833-11	METAL CHIP	10K	5%	1/16W
R124	1-216-833-11	METAL CHIP	10K	5%	1/16W
R129	1-216-833-11	METAL CHIP	10K	5%	1/16W
R134	1-216-833-11	METAL CHIP	10K	5%	1/16W
R135	1-216-833-11	METAL CHIP	10K	5%	1/16W
R136	1-216-845-11	METAL CHIP	100K	5%	1/16W
R137	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R138	1-216-833-11	METAL CHIP	10K	5%	1/16W
R139	1-216-833-11	METAL CHIP	10K	5%	1/16W
R141	1-216-833-11	METAL CHIP	10K	5%	1/16W
R144	1-216-833-11	METAL CHIP	10K	5%	1/16W
R151	1-216-839-11	METAL CHIP	33K	5%	1/16W
R152	1-216-835-11	METAL CHIP	15K	5%	1/16W
R153	1-216-849-11	METAL CHIP	220K	5%	1/16W
R155	1-216-805-11	METAL CHIP	47	5%	1/16W
R161	1-216-833-11	METAL CHIP	10K	5%	1/16W
R162	1-216-833-11	METAL CHIP	10K	5%	1/16W
R163	1-216-833-11	METAL CHIP	10K	5%	1/16W
R164	1-216-833-11	METAL CHIP	10K	5%	1/16W
R165	1-218-724-11	METAL CHIP	22K	0.5%	1/16W
R166	1-218-724-11	METAL CHIP	22K	0.5%	1/16W
R171	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R172	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R176	1-216-819-11	METAL CHIP	680	5%	1/16W
R177	1-216-845-11	METAL CHIP	100K	5%	1/16W
R178	1-216-815-11	METAL CHIP	330	5%	1/16W
R181	1-216-833-11	METAL CHIP	10K	5%	1/16W
R251	1-216-839-11	METAL CHIP	33K	5%	1/16W
R252	1-216-835-11	METAL CHIP	15K	5%	1/16W
R253	1-216-849-11	METAL CHIP	220K	5%	1/16W
R255	1-216-805-11	METAL CHIP	47	5%	1/16W
R261	1-216-833-11	METAL CHIP	10K	5%	1/16W
R262	1-216-833-11	METAL CHIP	10K	5%	1/16W
R263	1-216-833-11	METAL CHIP	10K	5%	1/16W
R264	1-216-833-11	METAL CHIP	10K	5%	1/16W
R265	1-218-724-11	METAL CHIP	22K	0.5%	1/16W
R266	1-218-724-11	METAL CHIP	22K	0.5%	1/16W
R271	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R272	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R276	1-216-819-11	METAL CHIP	680	5%	1/16W
R277	1-216-845-11	METAL CHIP	100K	5%	1/16W
R278	1-216-815-11	METAL CHIP	330	5%	1/16W
R280	1-216-833-11	METAL CHIP	10K	5%	1/16W
⚠R301	1-219-786-11	FUSIBLE	22	5%	1/4W F
⚠R306	1-219-786-11	FUSIBLE	22	5%	1/4W F
R356	1-216-815-11	METAL CHIP	330	5%	1/16W
R357	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R380	1-216-845-11	METAL CHIP	100K	5%	1/16W
R381	1-216-847-11	METAL CHIP	150K	5%	1/16W
R410	1-216-845-11	METAL CHIP	100K	5%	1/16W
R413	1-216-833-11	METAL CHIP	10K	5%	1/16W
R421	1-216-813-11	METAL CHIP	220	5%	1/16W
R431	1-216-809-11	METAL CHIP	100	5%	1/16W
R432	1-216-819-11	METAL CHIP	680	5%	1/16W
R433	1-216-816-11	METAL CHIP	390	5%	1/16W
R441	1-216-837-11	METAL CHIP	22K	5%	1/16W
R442	1-216-835-11	METAL CHIP	15K	5%	1/16W
R443	1-216-837-11	METAL CHIP	22K	5%	1/16W
R481	1-216-864-11	METAL CHIP	0	5%	1/16W
R482	1-216-846-11	METAL CHIP	120K	5%	1/16W
R483	1-216-813-11	METAL CHIP	220	5%	1/16W
R484	1-216-813-11	METAL CHIP	220	5%	1/16W
R485	1-216-845-11	METAL CHIP	100K	5%	1/16W
R508	1-216-845-11	METAL CHIP	100K	5%	1/16W
R511	1-216-805-11	METAL CHIP	47	5%	1/16W

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

Ref. No.	Part No.	Description			Remark
R512	1-216-805-11	METAL CHIP	47	5%	1/16W
R513	1-216-805-11	METAL CHIP	47	5%	1/16W
R514	1-216-805-11	METAL CHIP	47	5%	1/16W
R515	1-216-809-11	METAL CHIP	100	5%	1/16W
R516	1-216-809-11	METAL CHIP	100	5%	1/16W
R517	1-216-809-11	METAL CHIP	100	5%	1/16W
R551	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R552	1-216-817-11	METAL CHIP	470	5%	1/16W
R553	1-216-815-11	METAL CHIP	330	5%	1/16W
R613	1-216-853-11	METAL CHIP	470K	5%	1/16W
R614	1-216-841-11	METAL CHIP	47K	5%	1/16W
R623	1-216-864-11	METAL CHIP	0	5%	1/16W
R626	1-216-864-11	METAL CHIP	0	5%	1/16W
R801	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R802	1-216-809-11	METAL CHIP	100	5%	1/16W
R805	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R806	1-216-809-11	METAL CHIP	100	5%	1/16W
R807	1-216-809-11	METAL CHIP	100	5%	1/16W
R808	1-216-809-11	METAL CHIP	100	5%	1/16W
R851	1-216-833-11	METAL CHIP	10K	5%	1/16W
R855	1-216-864-11	METAL CHIP	0	5%	1/16W
R911	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R912	1-216-841-11	METAL CHIP	47K	5%	1/16W
R1001	1-216-864-11	METAL CHIP	0	5%	1/16W
R1002	1-216-864-11	METAL CHIP	0	5%	1/16W
R1035	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< VIBRATOR >			
X22	1-795-004-21	VIBRATOR, CERAMIC (10MHz)			
X550	1-781-998-11	VIBRATOR, CRYSTAL (45.1584MHz)			
**********					
	1-681-806-11	PT BOARD			
		*********			
		< CAPACITOR >			
⚠C900	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C901	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C910	1-113-920-11	CERAMIC	0.0022uF	20%	250V
C920	1-164-159-11	CERAMIC	0.1uF		50V
C921	1-164-159-11	CERAMIC	0.1uF		50V
C922	1-164-159-11	CERAMIC	0.1uF		50V
C923	1-164-159-11	CERAMIC	0.1uF		50V
C924	1-164-159-11	CERAMIC	0.1uF		50V
C950	1-164-159-11	CERAMIC	0.1uF		50V
C951	1-164-159-11	CERAMIC	0.1uF		50V
C952	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN900	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
		< DIODE >			
D910	8-719-911-19	DIODE 1SS119-25			
		< LINE FILTER >			
⚠LF900	1-419-625-11	COIL, LINE FILTER			

Ref. No.	Part No.	Description	Remark
		< LEAD >	
* LP900	1-690-880-31	LEAD (WITH CONNECTOR)	
		< RELAY >	
⚠RY910	1-755-356-11	RELAY	
		< TRANSFORMER >	
⚠TR950	1-435-548-11	TRANSFORMER, POWER	
**********			
		MISCELLANEOUS	
		**********	
5	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)	
6	1-792-812-11	WIRE (FLAT TYPE) (27 CORE)	
⚠7	1-777-071-61	CORD, POWER	
* 15	1-569-972-21	SOCKET, SHORT 2P	
58	1-792-813-11	WIRE (FLAT TYPE) (15 CORE)	
357	1-678-514-11	FLEXIBLE, BOARD	
⚠358	A-4672-541-A	OPTICS ASSY (KMS-260B)	
HR901	1-500-670-11	HEAD, OVER WRITE	
M101	A-4672-898-A	MOTOR ASSY, SPINDLE	
M102	A-4735-076-A	MOTOR ASSY, SLED	
M103	A-4735-074-A	MOTOR ASSY, LOADING	
S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT RATE DETECT, PROTECT DETECT)	
⚠TR900	1-435-544-11	TRANSFORMER, POWER	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT	
#2	7-685-850-04	SCREW +BVTT 2X3 (S)	
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#4	7-685-533-19	SCREW +BTP 2.6X6 TYPE S N-S	
#5	7-685-532-14	SCREW +BTP 2.6X5 TYPE S N-S	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-476-057-11	REMOTE COMMANDER (RM-D47M)	
	1-558-271-11	CORD, CONNECTION (AUDIO CONNECTING CORD)	
	1-574-264-11	CORD, LIGHT PLUG (OPTICAL CABLE)	
⚠	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)	
	4-235-443-11	MANUAL, INSTRUCTION (ENGLISH)	
	4-235-443-21	MANUAL, INSTRUCTION (FRENCH, SPANISH) (AEP)	
	4-235-443-31	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (AEP)	
	4-235-443-41	MANUAL, INSTRUCTION (SWEDISH, PORTUGUESE) (AEP)	
	4-981-643-11	COVER, BATTERY (for RM-D47M)	

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

REVISION HISTORY

Clicking the version allows you to jump to the revised page.
Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	2001.06	New