MDS-JE480

SERVICE MANUAL

Self Diagnosis
Supported model

Ver. 1.5 2006.12

US Model
AEP Model
UK Model

US and foreign patents licensed form Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-JE470
MD Mechanism Type	MDM-7S1A
Optical Pick-up Type	KMS-260B/260E

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 200mm 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 ±0.5 dB during play
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 OPTICAL 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

US model:	120 V AC, 60Hz
European model:	230 V AC, 50/60Hz
Power consumption	14 W (0.5 W in standby mode)
Dimensions (approx.)	430 x 95 x 285 mm
	(w/h/d) incl. projecting
	parts and controls
Mass (approx.)	3.0 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

SONY®

SAFETY CHECK-OUT

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

LEAKAGE

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

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.

2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

Fig. A. Using an AC voltmeter to check AC leakage.
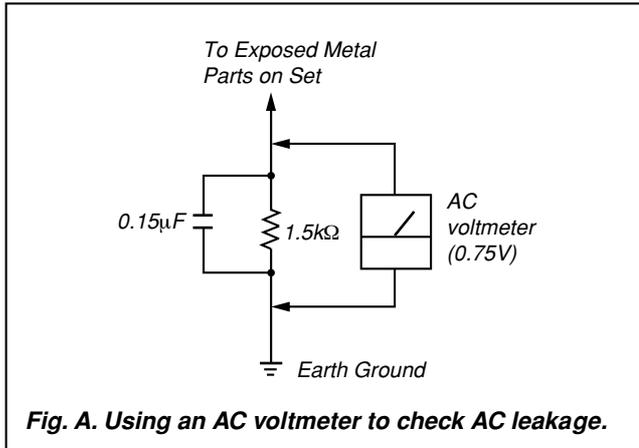
NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

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.

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

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

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

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHEREITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÄR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYAZAT! : A BURKOLAT NYITÁSAKOR LÁTHATATLAN LÉZERSUGÁRVESZÉLY! KERÜLJE A BESUGÁRZÁST!

This caution label is located inside the unit.

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

Notes on 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 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.

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.

SELF-DIAGNOSIS FUNCTION

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

Self-diagnosis function

The deck'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.

Three- or five-digit code/ Message	Cause/Remedy
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.

Three- or five-digit code/ Message	Cause/Remedy
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.
E0001/ MEMORY NG	There is an error in the internal data that the deck needs in order to operate. ➡ Consult your nearest Sony dealer.
E0101/ LASER NG	There is a problem with the optical pickup. ➡ The optical pick-up may have failed. Consult your nearest Sony dealer.
E0201 LOADING NG	There is a problem with the loading. ➡The loading may have failed. Consult your nearest Sony dealer.

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 $\boxed{\text{MENU/NO}}$ button to exit the mode.

1. While pressing the ⎹◄◄AMS►►⎸ knob and ■ button, connect the power plug to the outlet, and release the ⎹◄◄AMS►►⎸ knob and ■ button.
   When the test mode is set, "[Check]" will be displayed.
2. Rotate the ⎹◄◄AMS►►⎸ knob and when "[Service]" is displayed, press the YES button.
3. Rotate the ⎹◄◄AMS►►⎸ knob and display "Err Display".
4. Pressing the YES button sets the error history mode and displays "op rec tm".
5. Select the contents to be displayed or executed using the ⎹◄◄AMS►►⎸ knob.
6. Pressing the ⎹◄◄AMS►►⎸ knob will display or execute the contents selected.
7. Pressing the ⎹◄◄AMS►►⎸ knob another time returns to step 4.
8. Pressing the MENU/NO button displays "Err Display" and exits the error history mode.
9. To exit the test mode, press the REPEAT button. The unit sets into the STANDBY state, the disc is ejected, and the test mode ends.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS
Selecting the Test Mode

Display	History
op rec tm	Displays the total recording time. When the total recording time is more than 1 minute, displays the hour and minute When less than 1 minute, displays "Under 1 min" The display time is the time the laser is set to high power, which is about 1/4 of the actual recording time.
op play tm	Displays the total playback time. When the total playback time is more than 1 minute, displays the hour and minute When less than 1 minute, displays "Under 1 min"
spdl rp tm	Displays the total rotating time of the spindle motor. When the total rotating time is more than 1 minute, displays the hour and minute When less than 1 minute, displays "Under 1 min"
retry err	Displays the total number of retry errors during recording and playback Displays "r xx p yy". xx is the number of errors during recording. yy is the number of errors during playback. This is displayed in hexadecimal from 00 to FF.
total err	Displays the total number of errors Displays "total xx". This is displayed in hexadecimal from 00 to FF.
err history	Displays the past ten errors. Displays "0x ErrCd@@". X is the history number. The younger the number, the more recent is the history (00 is the latest). @@ is the error code. Select the error history number using the ⎹◄◄AMS►►⎸ knob.
retry adrs	Displays the past five retry addresses. Displays "xx ADRS yyyy", xx is the history number, yyyy is the cluster with the retry error. Select the error history number using the ⎹◄◄AMS►►⎸ knob.
er refresh	Mode for erasing the error and retry address histories Procedure 1. Press the ⎹◄◄AMS►►⎸ knob when displayed as "er refresh". 2. Press the YES button when the display changes to "er refresh?". When "complete!" is displayed, it means erasure has completed. Be sure to check the following after executing this mode. *Data has been erased. *Perform recording and playback, and check that the mechanism is normal.
tm change	Mode for erasing the total time of recording and playback Procedure 1. Press the ⎹◄◄AMS►►⎸ knob when displayed as "tm refresh". 2. Press the YES button when the display changes to "tm refresh?". When "complete!" is displayed, it means erasure has completed.
op change	Mode for erasing the total time of op rec tm, op play tm. These histories are based on the time of replacement of the optical pickup. If the optical pick-up has been replaced, perform this procedure and erase the history. Procedure 1. Press the ⎹◄◄AMS►►⎸ knob when displayed as "op change". 2. Press the YES button when the display changes to "op chang?". When "Complete!" is displayed, it means erasure has completed.

Display	History
spdl change	Mode for erasing the total spdl rp tm time These histories are based on the time of replacement of the spindle motor. If the spindle motor has been replaced, perform this procedure and erase the history. Procedure 1. Press the ⟦⫷⫷AMS▷▷⟧ knob when displayed as "spdl change" 2. Press the ⟦YES⟧ button when the display changes to "spdl chang?" When "Complete!" is displayed, it means erasure has completed.

Table of Error Codes

Error Code	Description
10	Could not load
12	Loading switches combined incorrectly
20	Timed out without reading the top of PTOC
21	Could read top of PTOC, but detected error
22	Timed out without accessing UTOC
23	Timed out without reading UTOC
24	Error in UTOC
30	Could not start playback
31	Error in sector
40	Retry cause generated during normal recording
41	Retried in DRAM overflow
42	Retry occurred during TOC writing
43	Retry aborted during S.F editing
50	Other than access processing, and could not read address.
51	Focus NG occurred and overran.

MODEL IDENTIFICATION
— *BACK PANEL* —

Part No.
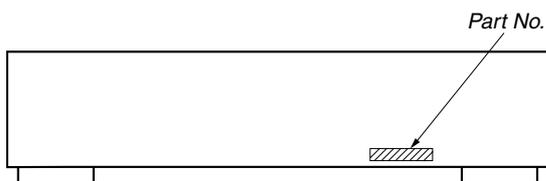
MODEL	PARTS No.
US model	4-238-633-0□
AEP and Russian models	4-238-633-5□
UK model	4-238-633-6□

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SECTION 1
SERVICE NOTES

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.

GND : Ground
I+3V : For measuring Iop (Check the deterioration of the optical pick-up laser)
Iop : For measuring Iop (Check the deterioration of the optical pick-up laser)
TE : TRK error signal (Traverse adjustment)
VC : Reference level for checking the signal
RF : RF signal (Check jitter)
FE : Focus error signal
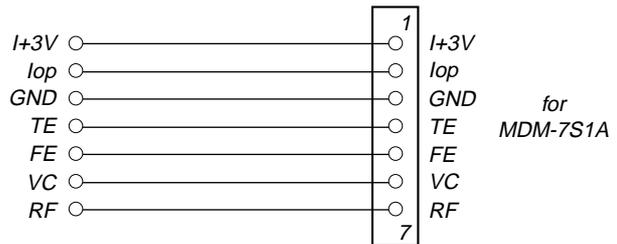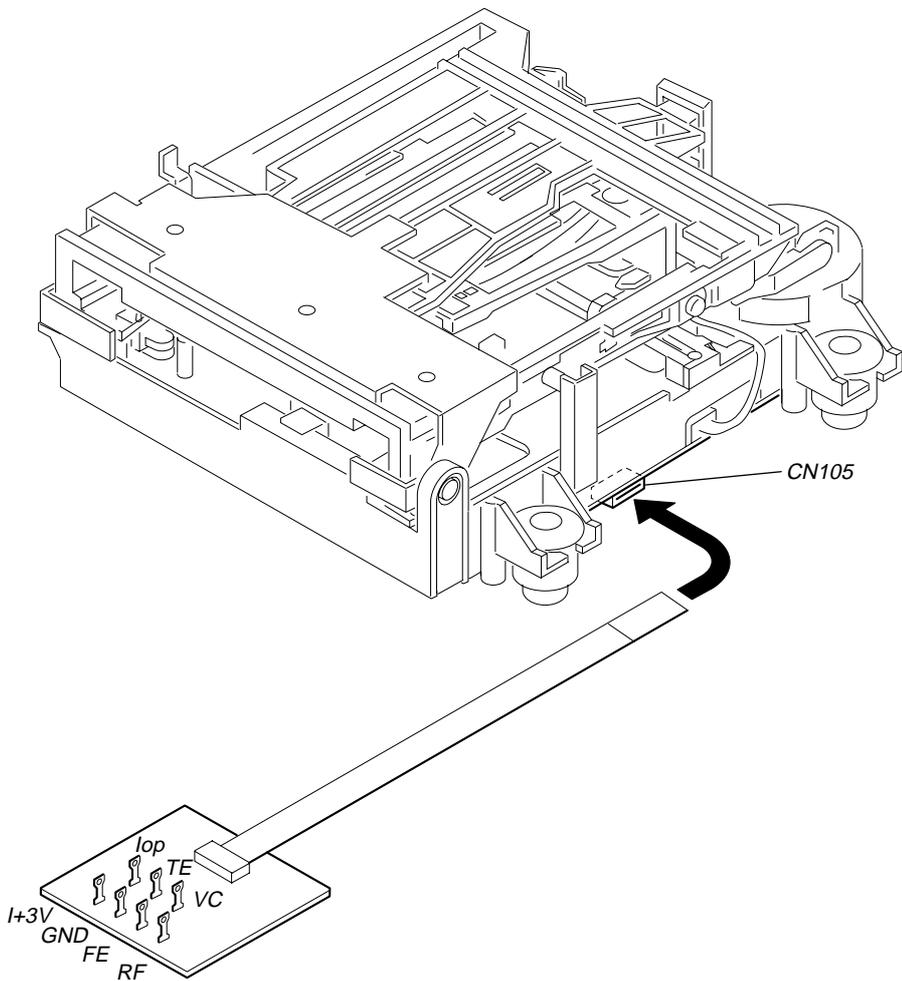
Iop DATA RECORDING AND DISPLAY WHEN OPTICAL PICK-UP AND NON-VOLATILE MEMORY (IC195 OF BD BOARD) ARE REPLACED

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 Procedure:
1. While pressing the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and $\boxed{\blacksquare}$ button, connect the power plug to the outlet, and release the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and $\boxed{\blacksquare}$ button.
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "[Service]", and press the $\boxed{\text{YES}}$ button.
3. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "Iop Write" (C05), and press the $\boxed{\text{YES}}$ 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 : Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob.
   To select the digit   : Press the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob.
6. When the $\boxed{\text{YES}}$ 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 $\boxed{\text{YES}}$ button.
8. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".
9. Press the $\boxed{\text{REPEAT}}$ button to complete.
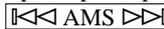
Display Procedure:
1. While pressing the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and $\boxed{\blacksquare}$ button, connect the power plug to the outlet, and release the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and $\boxed{\blacksquare}$ button.
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "[Service]", and press the $\boxed{\text{YES}}$ button.
3. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "Iop Read" (C26).
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 $\boxed{\text{I◁◁ AMS ▷▷I}}$ button or $\boxed{\text{MENU/NO}}$ button to display "Iop Read". Then press the $\boxed{\text{REPEAT}}$ button.

OPTICAL PICK-UP BLOCK TYPE DISCRIMINATION

There are two types of the optical pick-up block in this model.
These are compatible except for the laser power.
Check the type of the optical pick-up block before replacement.
Ajdust following items after replacing the optical pick-up block.
• 5-6-2. Laser Power Check (See page 28)
• 5-10. LASER POWER ADJUSTMENT (See page 31)

Differences

	KMS-260B	KMS-260E
Color of the adhesive agent at PDIC portion	Pink	White
Form of FPC retainer plate	Close the hole on SL base	Not close the hole on SL base
APC variable resistor	Small volume (2 type)	Big variable resistor (3 type) and chip resistor (Fig. A)
		Small variable resistor (2 type) and chip resistor (Fig. B)

Fig. B type is for repair.
• Abbreviation
260B: KMS-260B model
260E: KMS-260E model

KSN-260B

Hold on SL base

APC variable resistor

Adhesive agent at PDIC portion

FPC retainer plate

KSN-260E

Hold on SL base

FPC retainer plate

Adhesive agent at PDIC portion

(Fig A)
CHIP
3 type variable resistor

(Fig B)
CHIP
2 type variable resistor
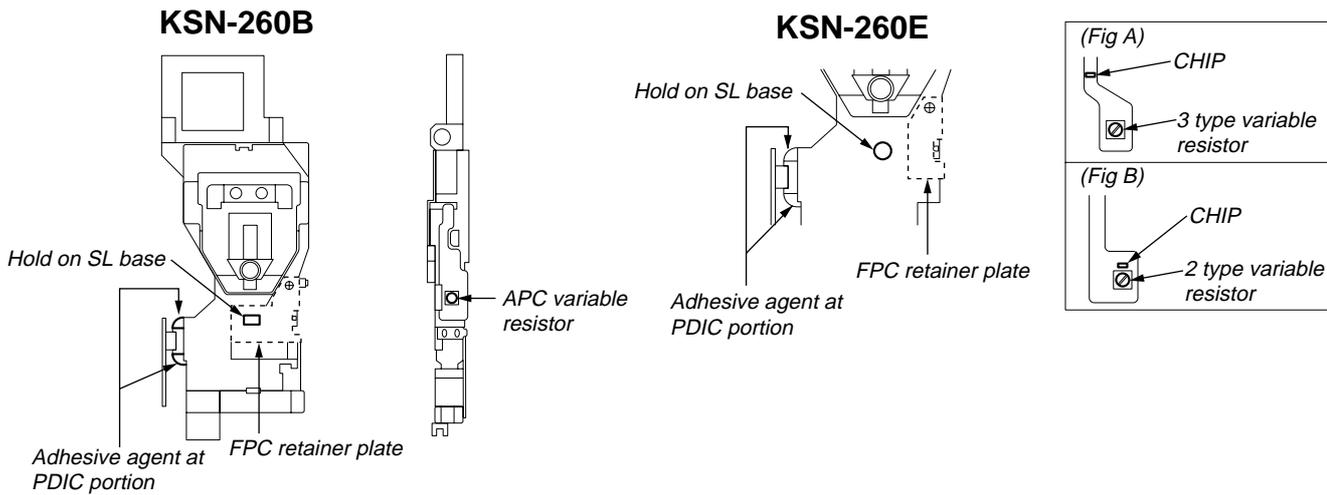
CHECKS PRIOR TO PARTS REPLACEMENT AND ADJUSTMENTS

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

• 5-6-2. Laser power check (see page 28)
• 5-6-3. Iop Compare (see page 28)
• 5-6-4. Auto Check (see page 29)

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

FORCED RESET

The system microprocessor can be reset in the following procedure.
Use these procedure when the unit cannot be operated normally due to the overrunning of the microprocessor, etc.
Procedure :
Remove the short-pin attached to CN406, and then attach it again.

[MAIN BOARD] (Component Side)

CN406

MDS-JE480
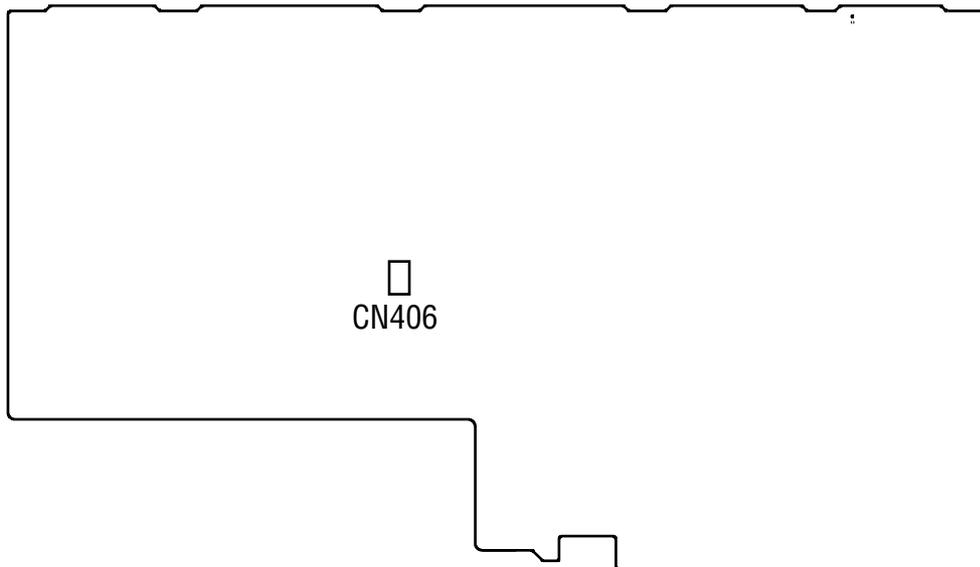
RETRY CAUSE DISPLAY MODE

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

Procedure:
1. Insert the recordable disc.
2. Press MENU/NO button to display "Edit Menu" on the fluorescent display.
3. Turn ⏮ AMS ⏭ button to display "All Erase?" on the fluorescent display.
4. Press YES button to display "All Erase??" on the fluorescent display.
5. Press YES button, "Complete!" is displayed on the fluorescent display and it turns off immediately.
6. Procedure 1: Press the ■ button continuously for about 10 seconds.
   Procedure 2: Press the LEVEL/DISPLAY/CHAR button while pressing the ■ button and MENU/NO button.
7. When the mode is set, "RTs 00c 00e 000" is displayed.
8. Press the ● REC button to start recording. Then press the ❚❚ button and start recording.
9. To check the "track mode", press the ▷ button to start play.
10. To exit the test mode, press the I/⏻ button, and turn OFF the power. When "TOC" disappears, disconnect the power plug from the outlet.
    If the test mode cannot be exited, refer to "Forced Reset" on page 9.

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

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

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

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

@@###**$$
Fluorescent display tube display

@@ : Parts No. (name of area named on TOC)
: Cluster } Address (Physical address on disc)
** : Sector
$$: 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 → b2
The retry cause in this case is combined of "access fault", "IVR rec error", and "ader5".

Reading the Track Mode Display

Hexadecimal	Higher Bits				Lower Bits				Hexa-decimal	Details	
	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 exists", and "write allowed".

Example When 07 is displayed:
Higher bit : 0 = 1000 → All 0
Lower bit : 7 = 0111 → b0+b1+b2
In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of "emphasis ON", "stereo", "original", "copyright exists", and "write prohibited".

Hexadecimal → Binary Conversion Table

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

MDS-JE480

This section is extracted from instruction manual.

Main unit

ALPHABETICAL ORDER

A - M

AMS 19 (10) (16) (18) (21) (23) (25)
CLEAR 18 (17) (22)
Display window 13
EJECT ⏏ 4 (8) (16) (17)
INPUT 14 (8)
LEVEL/DISPLAY/CHAR 12 (8) (16) (21)
MD (insertion slot) 2
MDLP (indicator) 3 (9) (16)
MENU/NO 8 (9) (10) (11) (21)

P - Z

PLAY MODE 10 (15)
PUSH ENTER 19 (10)
REC MODE 16 (9) (16)
REC ● 17 (8)
REPEAT 11 (15)
STANDBY (indicator) 1 (8) (15)
YES 9 (16)

BUTTON DESCRIPTIONS

I/⏻ 1 (8) (15) (17)
▷ 5 (8) (15)
II 6 (8) (16)
■ 7 (8) (16) (17)
◀◀/▶▶ 15 (16) (18)

12
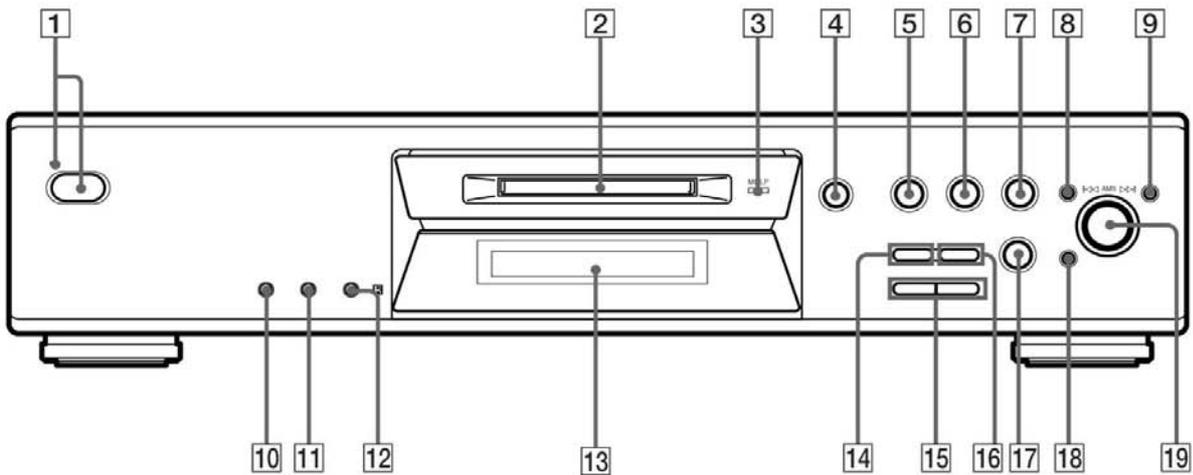
SECTION 3
DISASSEMBLY

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

3-1. DISASSEMBLY FLOW

```
                          ┌─────────┐
                          │  SET    │
                          └─────────┘
                               │
                               ▼
                   ┌───────────────────────┐
                   │ 3-2 UPPER CASE (408226)│
                   └───────────────────────┘
                               │
        ┌──────────────┬───────┴───────┬──────────────────┐
        ▼              ▼               ▼                  ▼
┌──────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────────┐
│3-3 FRONT PANEL│ │3-4 MAIN BOARD│ │3-5 PT BOARD  │ │3-6 MECHANISM DECK │
│   SECTION    │ │              │ │              │ │SECTION (MDM-7S1A) │
└──────────────┘ └──────────────┘ └──────────────┘ └──────────────────┘
                                                            │
                            ┌───────────────────────────────┴───────┐
                            ▼                                        ▼
                   ┌ ─ ─ ─ ─ ─ ─ ─ ─ ┐            ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
                   │ ┌─────────────┐ │            │ ┌──────────────────┐ │
                   │ │3-7 BD BOARD │ │            │ │3-7 OVER LIGHT HEAD│ │
                   │ └─────────────┘ │            │ │     (HR901)      │ │
                   │ ┌─────────────┐ │            │ └──────────────────┘ │
                   │ │3-8 HOLDER ASSY│            │ ┌──────────────────┐ │
                   │ └─────────────┘ │            │ │  3-7 BD BOARD    │ │
                   └ ─ ─ ─ ─ ─ ─ ─ ─ ┘            │ └──────────────────┘ │
                            │                     │ ┌──────────────────┐ │
              ┌─────────────┴──────┐              │ │ 3-8 HOLDER ASSY  │ │
              ▼                    ▼              │ └──────────────────┘ │
      ┌──────────────┐   ┌──────────────────┐    └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
      │3-10 SLED MOTOR│  │3-9 LOADING MOTOR │              │
      │  ASSY (M102) │   │   ASSY (M103)    │              ▼
      └──────────────┘   └──────────────────┘    ┌──────────────────┐
                                                 │3-11 OPTICAL PICK-UP│
                                                 │  (KMS-260B/260E)  │
                                                 └──────────────────┘
                                                          │
                                                          ▼
                                                 ┌──────────────────┐
                                                 │3-12 SPINDLE MOTOR │
                                                 │   ASSY (M101)    │
                                                 └──────────────────┘
```
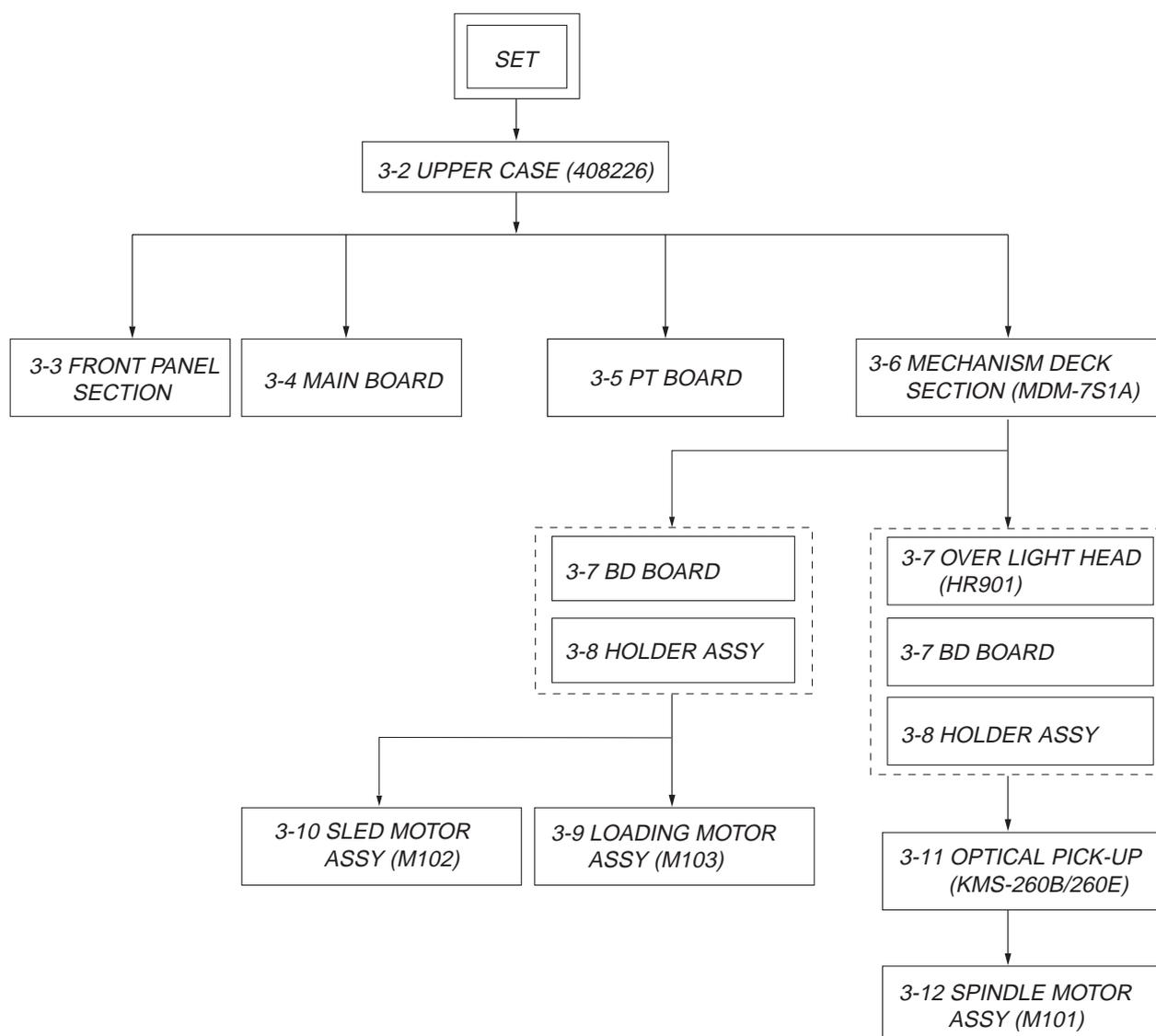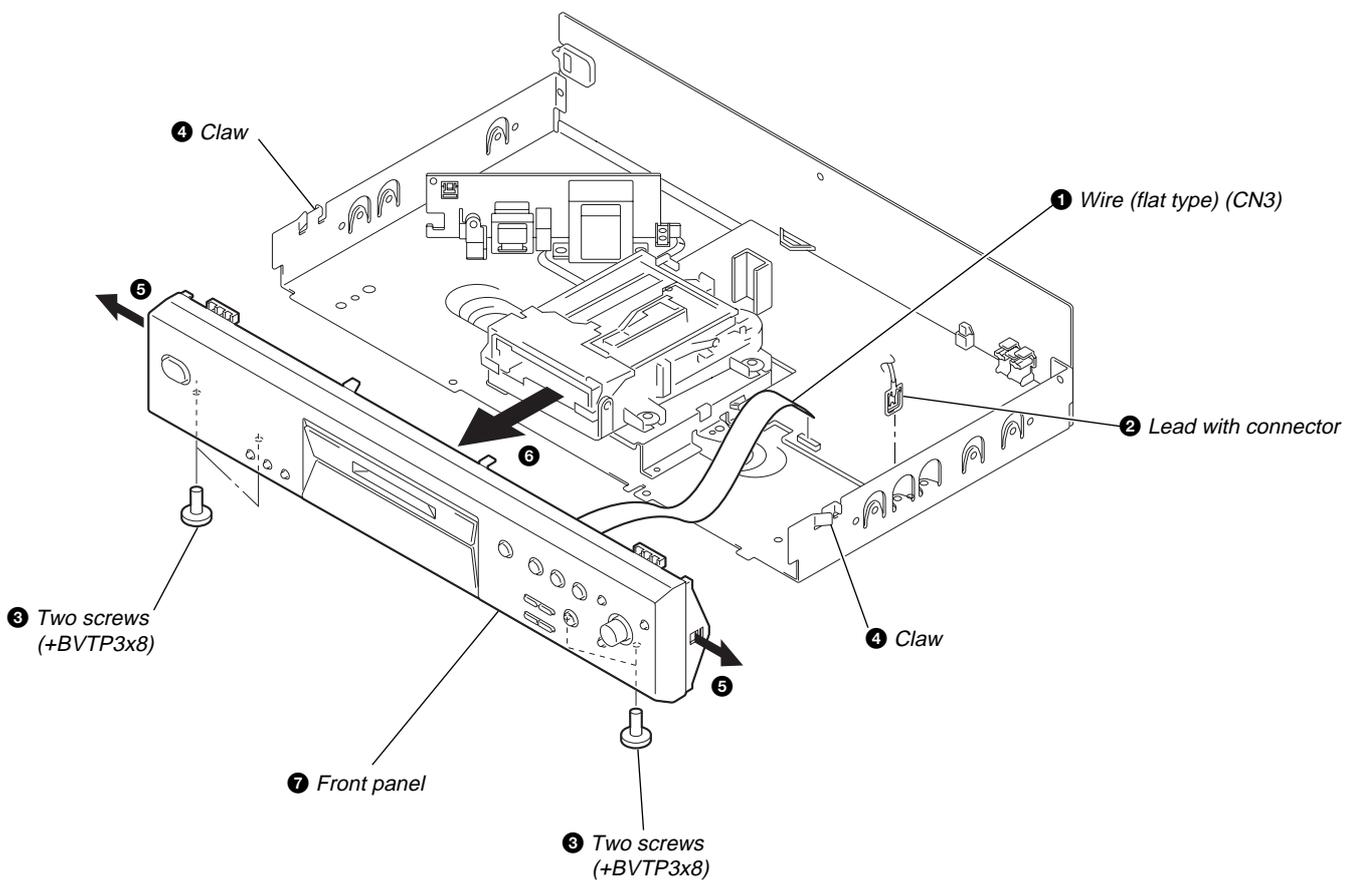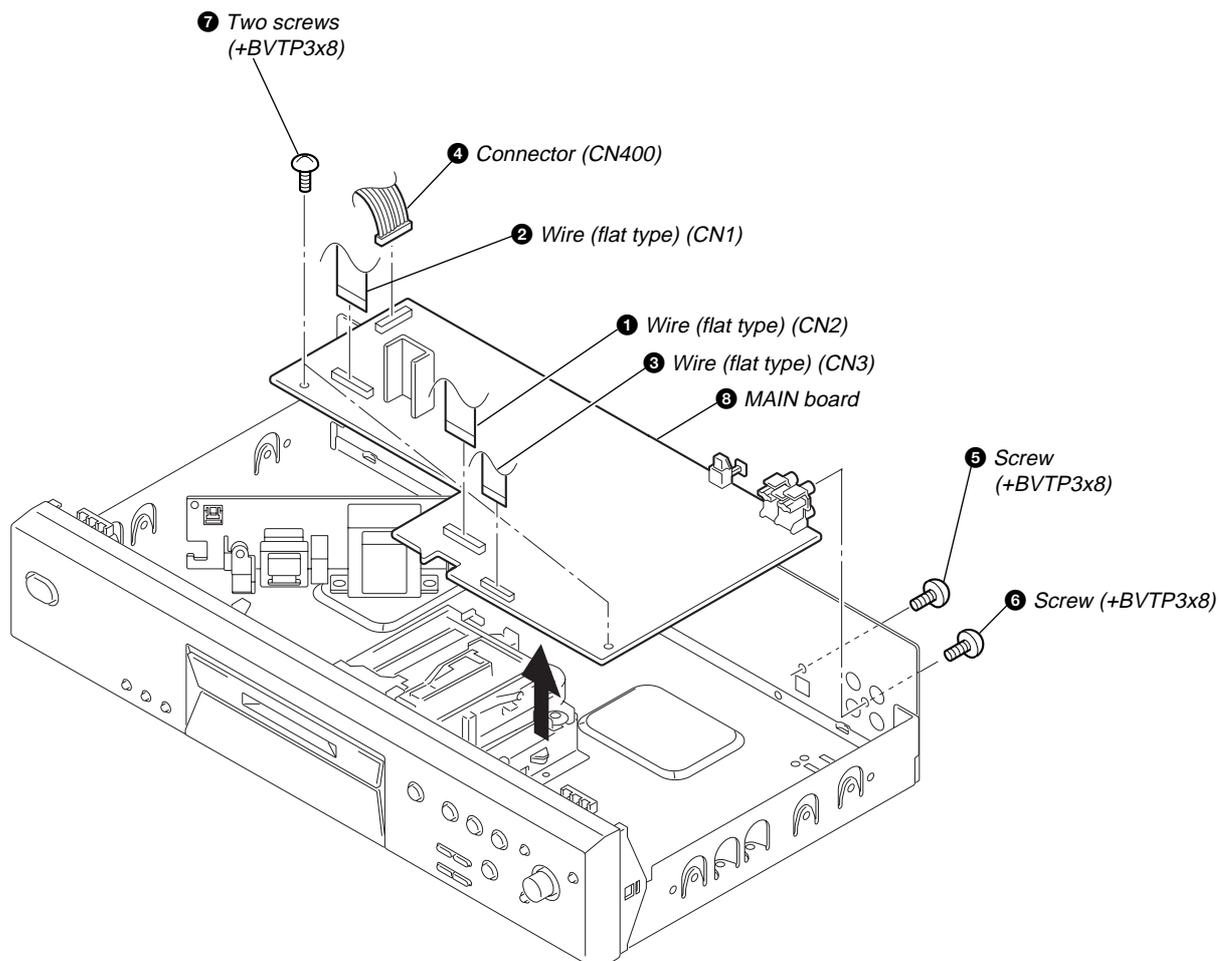
Note 1: The processes enclosed with ⌐ ¯ ¯ ¬ , remove in the any order.
Note 2: You cannot go to the next process until every process enclosed with ⌐ ¯ ¯ ¬ has done.

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3-2. UPPER CASE (408226)

❷ Case (408226)

❶ Two screws
(CASE 3TP2)

❶ Screw
(CASE 3TP2)

❶ Two screws
(CASE 3TP2)

3-3. FRONT PANEL SECTION

❹ Claw

❶ Wire (flat type) (CN3)

❺

❷ Lead with connector

❻

❸ Two screws
(+BVTP3x8)

❹ Claw

❺

❼ Front panel

❸ Two screws
(+BVTP3x8)

14

3-4. MAIN BOARD

❼ Two screws
(+BVTP3x8)

❹ Connector (CN400)

❷ Wire (flat type) (CN1)

❶ Wire (flat type) (CN2)

❸ Wire (flat type) (CN3)

❽ MAIN board

❺ Screw
(+BVTP3x8)

❻ Screw (+BVTP3x8)

3-5. PT BOARD

❸ Three screws
(+PTTWH M3)

❹ PT board

❶ Connector (CN900)

❷ Nylon rivet (dia 3)

MDS-JE480

3-6. MECHANISM DECK SECTION (MDM-7S1A)

❷ Two step screws
(+BVTTWH M3)

❸ Mechanism deck (MDM-7S1A)

❷ Two step screws
(+BVTTWH M3)

❶ Lead with connector
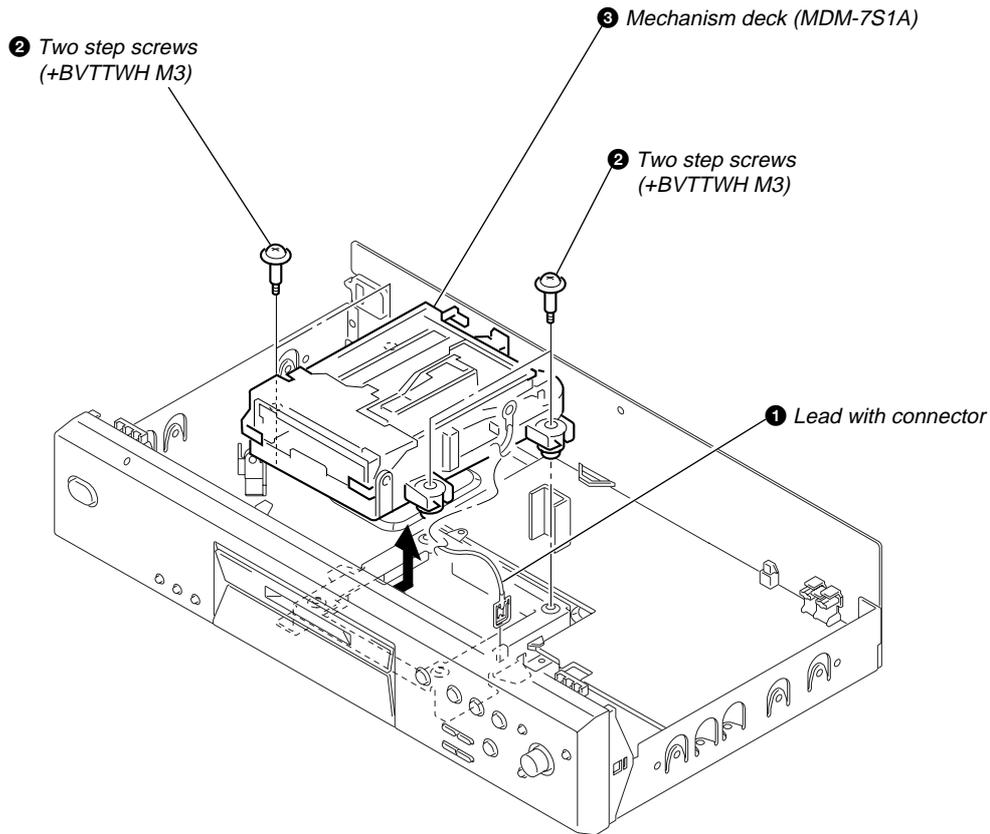
3-7. OVER LIGHT HEAD (HR901), BD BOARD

Note 1: If you disconnect the connector (CN104), you can remove the
BD board without removing the over write head (HR901).
Note 2: Be careful to handle the over write head (HR901) because it is
easy to be damaged.

❷ Screw (P1.7X6)

❸ Over light head (HR901)

❺ Remove the solder (four portion)

❾ BD board

❼

❶ Connector (CN104)

❽ FLEXIBLE board (CN101)

❹ Remove the solder (five portion)

❻ Two screws (BTP2X6)

3-8. HOLDER ASSY

❼ *Holder Assy*

❸ *Claw*

❹

❺

❻ *Boss*

❷

❶ *Tension spring (holder)*

❻ *Boss*

3-9. LOADING MOTOR ASSY (M103)

❶ *Belt (loading)*

❷ *Two screws (PWH1.7x2.5)*

❸
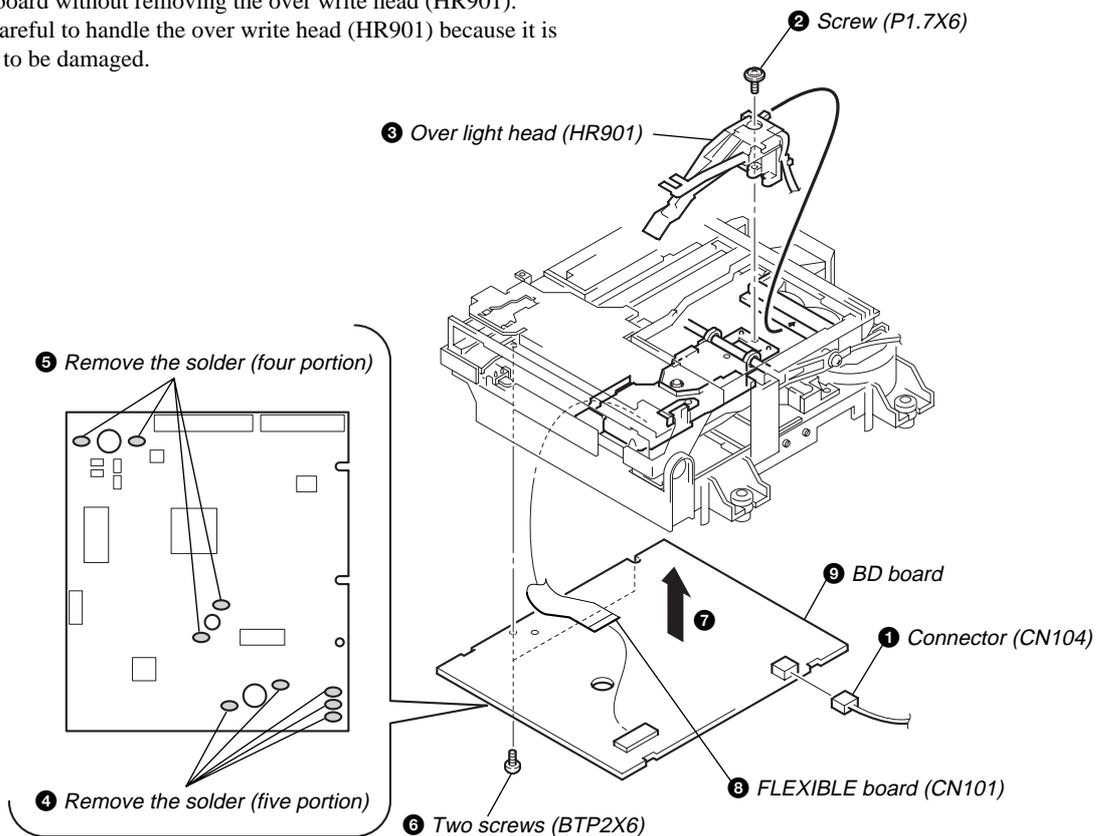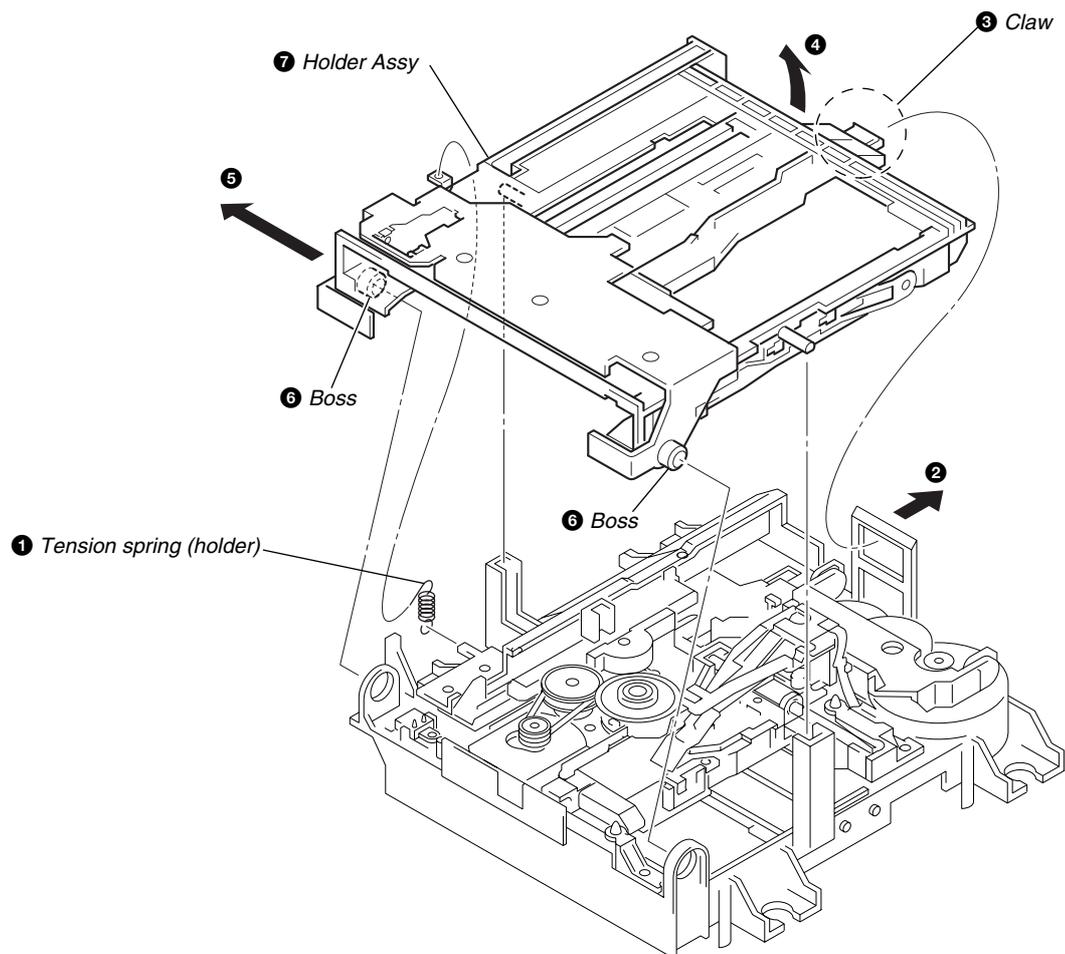
❹ *Loading motor Assy (M103)*
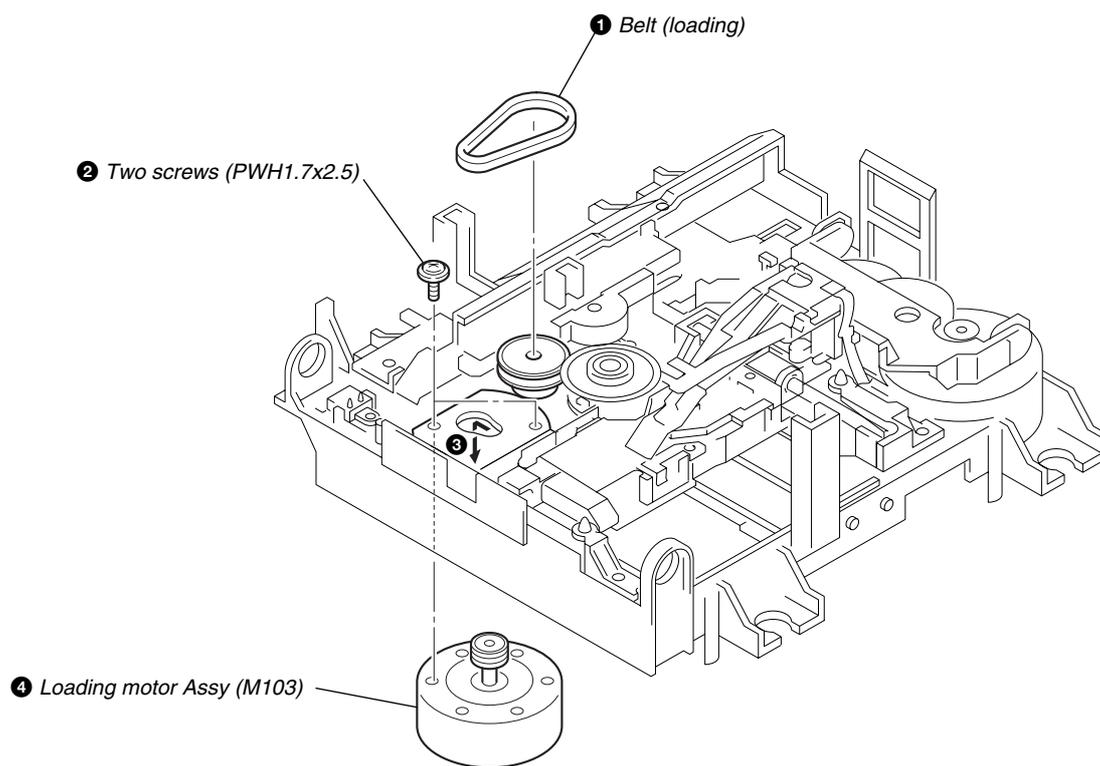
3-10. SLED MOTOR ASSY (M102), SLIDER

❺ Remove the claw.
Shift the slider in the arrow
Ⓐ direction.

❸

❹ Slider (EJ)

❻ Slider

Ⓐ

❽ Lever (head)

❶ Two screws (BTP2X6)

❷ Guide (L)

❼ Lever (CHG)

❾ Two screws
(PWH1.7X2.5)

❿ Motor Assy, sled
(M102)

3-11. OPTICAL PICK-UP

⓫ Optical pick-up
(KMS-260B/260E)

❶ FLEXIBLE board

❼ Main shaft

❿ SL base

❾ Screw (P1.7X6)

❻ Two screws (K2X6)

❽

❹ Screw (BTP2X6)

❺ Base (BU-A)

❸ Gear (SD)

❷ Screw (M1.7), tapping

3-12. SPINDLE MOTOR ASSY (M101)

❸ *Spindle motor Assy (M101)*

❶ *Three screws (M1.7), tapping*
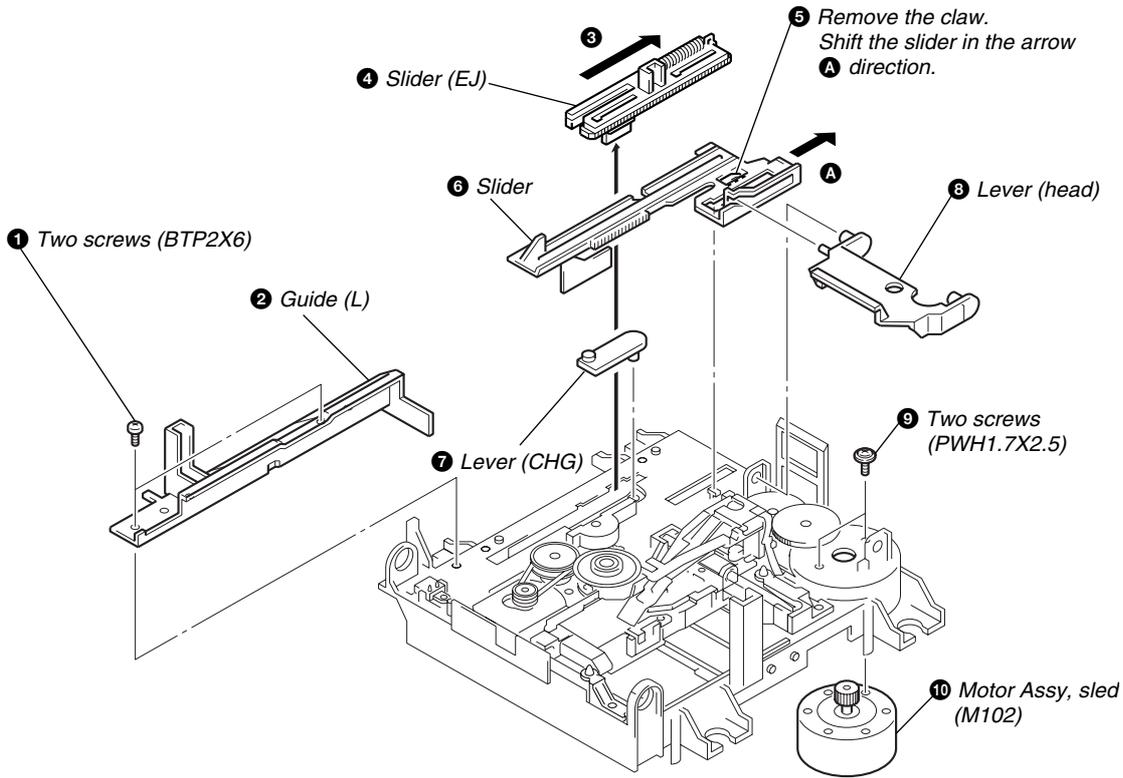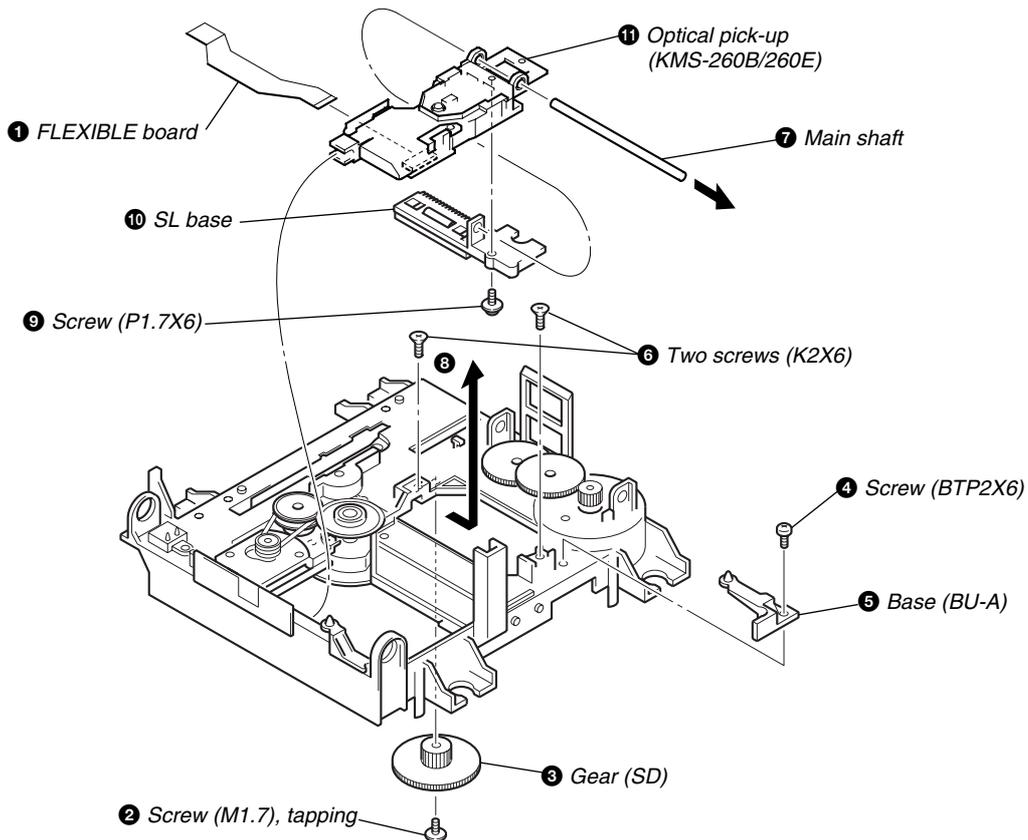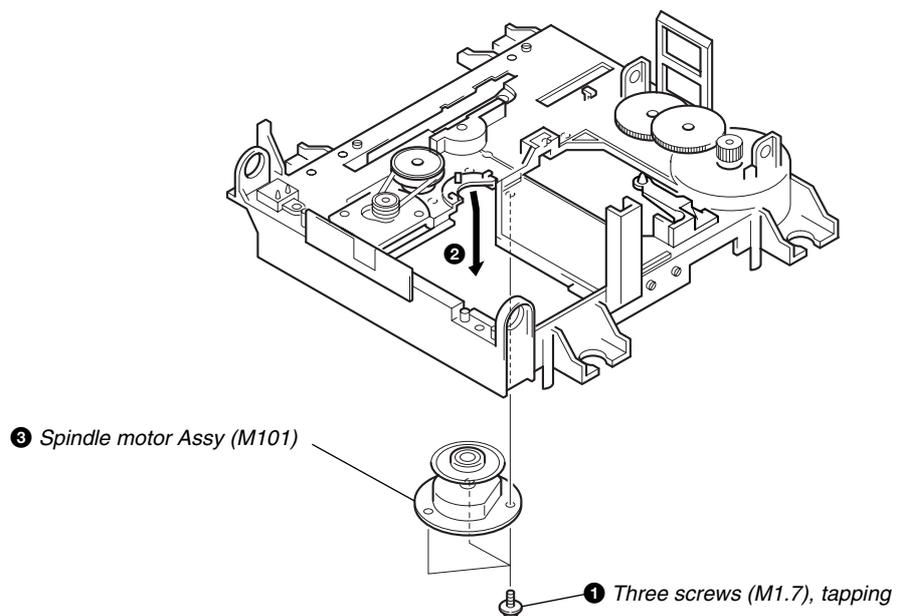
SECTION 4
TEST MODE

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 ⏏ EJECT button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.

  Therefore, it will be ejected while rotating.

  Be sure to press the ⏏ EJECT button after pressing the MENU/NO button and the rotation of disc is stopped.

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

- Continuous recording mode (CREC 1MODE) (C35)
- Laser power check mode (LDPWR CHECK) (C13)
- Laser power adjustment mode (LDPWR ADJUST) (C04)
- Iop check (Iop Compare) (C27)
- Iop value nonvolatile writing (Iop NV Save) (C06)
- Traverse (MO) check (EF MO CHECK) (C14)
- Traverse (MO) adjustment (EF MO ADJUST) (C07)
- When pressing the ● REC button.

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: While pressing the |◁◁ AMS ▷▷| knob and ■ button, connect the power plug to an outlet, and release the |◁◁ AMS ▷▷| knob and ■ button.

When the test mode is set, "[Check]" will be displayed. Rotating the |◁◁ AMS ▷▷| knob switches between the following three groups; ··· ←→ Check ←→ Service ←→ Develop ←→ ···.

Procedure 2: While pressing the |◁◁ AMS ▷▷| knob, connect the power plug to the outlet and release the |◁◁ AMS ▷▷| knob.

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

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.

4-3. EXITING THE TEST MODE

Press the REPEAT button. The disc is ejected when loaded, and "Standby" display blinks, and the STANDBY state is set.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the |◁◁ AMS ▷▷| knob, YES button, and MENU/NO button.

The functions of these buttons are as follows.

Function name		Function
MENU/NO button		Cancel or move to top hierarchy
YES button		Set
AMS knob	Left or Right	Select
	Push	Set submenu

4-5. SELECTING THE TEST MODE

There are 25 types of test modes as shown below. The groups can be switched by rotating the $\boxed{\mathrm{I \triangleleft \triangleleft \ AMS \ \triangleright \triangleright I}}$ knob. After selecting the group to be used, press the $\boxed{\mathrm{YES}}$ button. After setting a certain group, rotating the $\boxed{\mathrm{I \triangleleft \triangleleft \ AMS \ \triangleright \triangleright I}}$ knob switches between these modes. Refer to "Group" in the table for details selected.

All adjustments and checks during servicing can be performed in the test mode in the Service group.

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 $\boxed{\mathrm{MENU/NO}}$ button immediately to exit the [Develop] group.

Display	No.	Details	Mark	Group Check	Group 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	Focus, tracking gain adjustment (MO)			◯
AG Set (CD)	C11	Focus, tracking gain 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 3.
• If a different mode has been selected by mistake, press the $\boxed{\mathrm{MENU/NO}}$ button to exit 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 $\boxed{\mathrm{MENU/NO}}$ button to exit 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 Rotate the ⏮ AMS ⏭ knob and display "CPLAY1 MODE"(C34).
   ③ Press the YES button to change the display to "CPLAY1 MID".
   ④ When access completes, the display changes to "C = ▯▯▯▯▯ AD = ▯▯".
   Note : The numbers "▯" displayed show you error rates and ADER.
2. Changing the parts to be played back
   ① Press the YES button during continuous playback to change the display as below.
   "CPLAY1 MID" → "CPLAY1 OUT" → "CPLAY1 IN" ⌐

   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 "CPLAY1 MODE"(C34).
   ② Press the ⏏EJECT button to remove 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/playback check.)

1. Entering the continuous recording mode
   ① Set a recordable disc in the unit.
   ② Rotate the ⏮ AMS ⏭ knob and display "CREC1 MODE" (C35).
   ③ Press the YES button to change the display to "CREC1 MID".
   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.
   "CREC1 MID" → "CREC1 OUT" → "CREC1 IN" ⌐

   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 "CREC1 MODE" (C35) and **REC** goes off.
   ② Press the ⏏ EJECT button to remove 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
▷	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.
REPEAT	Exits 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 and CREC are started, the display will forcibly be switched to the error rate display as the initial mode.

1. Mode display
Displays "TEMP ADJUST", "CPLAY1MODE", etc.

2. Error rate display
Displays the error rate in the following way.
    C = □□□□ AD = □□
    C = Indicates the C error.
    AD = Indicates ADER.

3. Address display
The address is displayed as follows. (MO:recordable disc, CD:playback only disc)
If the REC MODE button is pressed , the display switches from groove to pit or vice versa.
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 cannnot be read.

Mode display
↓
Error rate display
↓
Address display
↓
Auto gain display (Not used in servicing)
↓
Detrack check display (Not used in servicing)
↓
IVR display (Not used in servicing)
↓
C1 error and Jitter display
(Not used in servicing)
↓
AD error and Jitter display
(Not used in servicing)
↓
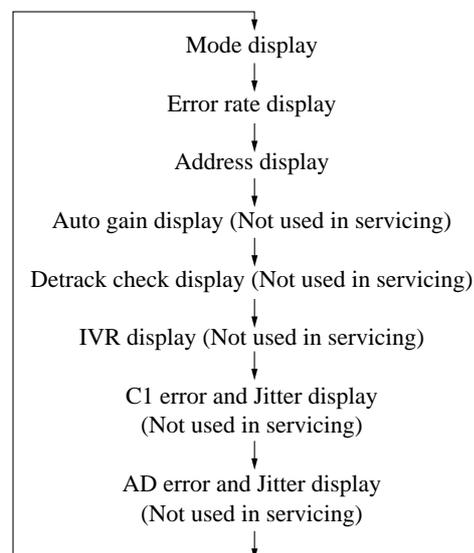
4-8. MEANINGS OF OTHER DISPLAYS

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	
REC MODE	Pit	Groove
DISC/LP2	High reflection	Low reflection
SLEEP/SHUF	CLV S	CLV A
MONO	CLV LOCK	CLV UNLOCK

4-9. 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 check.

Procedure
1. 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 step 1.
2. 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.
3. If a disk is loaded at step 2, the check will start automatically.
4. When "XX CHECK" is displayed, the item corresponding to XX will be performed.
   When "06 CHECK" completes, the disc loaded at step 2 will be ejected. "DISC IN" will be displayed. Load the check disc (MD) TDYS-1.
5. When the disc is loaded in step 4, the check will automatically be resumed from "07 CHECK".
6. 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 the other spindle motor, thread motor, etc.
When displayed as "NG:xxxx", it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

4-10. INFORMATION

Display the software version.

Procedure
1. If displayed as "INFORMATION", press the YES button.
2. The software version will be displayed.
3. Press the MENU/NO button to end this mode.

4-11. 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. Set the test mode. (Refer to 4-2.)
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 STOP button and ⏏ EJECT button together.
4. Rotate the |◁◁ AMS ▷▷| knob and select MDM-7S1A.
5. Press the |◁◁ AMS ▷▷| knob. 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.

Note: When this setting is doing, readjustment is necessary.
(Adjustment it same as IC195 exchanged)

SECTION 5
ELECTRICAL ADJUSTMENTS

Note : 260B: KMS-260B
260E: KMS-260E

5-1. PARTS REPLACEMENT AND ADJUSTMENT

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

Check before replacement

MDS-JE480

Adjustment flow

Start

• Abbreviation
OP: Optical pick-up

Replace IC195 — YES →
After turning off and then on the power,
initialize the EEPROM
For details, refer to 4-11. WHEN MEMORY NG IS
DISPLAYED (See page 24)

NO ↓

Replace OP or IO195 — YES →
5-7. INITIAL SETTING OF ADJUSTMENT VALUE
(See page 31)

NO ↓

Replace IC101, IC195, or D101 — YES →
5-9. TEMPERATURE COMPENSATION OFFSET
ADJUSTMENT (See page 31)

NO ↓

Replace OP, IC933, or IC195 — YES →
5-10. LASER POWER ADJUSTMENT (See page 31)

NO ↓

Replace OP, IC701, IC933,
or IC195 — YES →
5-11. Iop NV SAVE (See page 32)

NO ↓

Replace OP, IC101, IC201,
or IC195 — YES →
5-12. TRAVERSE ADJUSTMENT (See page 32)
5-13. FOCUS BIAS ADJUSTMENT (See page 33)
5-16. AUTO GAIN CONTROL OUTPUT LEVEL
ADJUSTMENT (See page 34)

NO ↓

Replace OP — YES →
OP change in Err Display mode
Iop write

NO ↓

Replace the spindle motor — YES →
Spdl change in Err Display mode

NO ↓

5-6-4. Auto Check
(See page 29)

↓

End adjustments

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.

pick-up

flexible board

laser tap
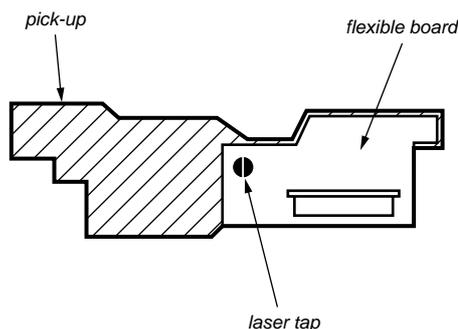
Optical pick-up flexible board

5-4. 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, exit the test mode.
   Perform the adjustments and checks in "group S" 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 (MD) TDYS-1
     (Parts No. 4-963-646-01)
   - Test Disk (MDW-74/GA-1) (Parts No. 4-229-747-01)
   - Laser power meter LPM-8001 (Parts No. J-2501-046-A)
   or
     MD Laser power meter 8010S (Parts No. J-2501-145-A)
   - Oscilloscope (Measure after performing CAL of prove.)
   - Digital voltmeter
   - Thermometer
   - Jig for checking BD board waveform
     (Parts 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 Note on page 6.)
7) As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

Adjustment	Parts to be replaced						
	Optical Pick-up	IC101	IC701	IC201	IC933	IC195	D101
5-7. Initial setting of adjustment values	◯	✕	✕	✕	✕	◯	✕
5-8. Recording of Iop information	◯	✕	✕	✕	✕	◯	✕
5-9. TEMP ADJUST	✕	◯	✕	✕	✕	◯	◯
5-10. Laser power adjustment	◯	✕	✕	✕	◯	◯	✕
5-11. Iop NV Save	◯	✕	◯	✕	◯	◯	✕
5-12. Traverse adjustment	◯	◯	✕	◯	✕	◯	✕
5-13. Focus bias adjustment	◯	◯	✕	◯	✕	◯	✕
5-16. Auto gain adjustment	◯	◯	✕	◯	✕	◯	✕
5-6-4. AUTO CHECK	◯	◯	✕	◯	◯	◯	✕

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5-5. 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. Rotate the ⊩◁◁ AMS ▷▷⊩ knob and display "CREC1 MODE".
3. Press the YES button again to display "CREC1 MID".
4. Press the LEVEL/DISPLAY/CHAR button.
   Display "CREC (0300)" and start to recording.
5. Complete recording within 5 minutes.
6. Press the MENU/NO button and stop recording .
7. Press the ⏏EJECT button and remove the disc.

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

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

5-6. CHECKS PRIOR TO REPAIRS

These checks are performed before replacing parts according to "approximate specifications" to determine the faulty locations. For details, refer to "Checks Prior to Parts Replacement and Adjustments" (See page 9).

5-6-1. Temperature Compensation Offset Check

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

Checks cannot be performed properly if performed after some time from power ON due to the rise in the temperature of the IC and diode, etc. So, perform the checks again after waiting some time.

Checking Procedure:
1. Rotate the ⊩◁◁ AMS ▷▷⊩ 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.)

5-6-2. Laser Power Check

Before checking, check the Iop value of the optical pick-up. (Refer to 5-8. Recording and Displaying Iop Information.)

Connection :

Laser power meter

Optical pick-up objective lens

Digital volt meter

BD board
CN105 pin ① (I+3V)
CN105 pin ② (Iop)
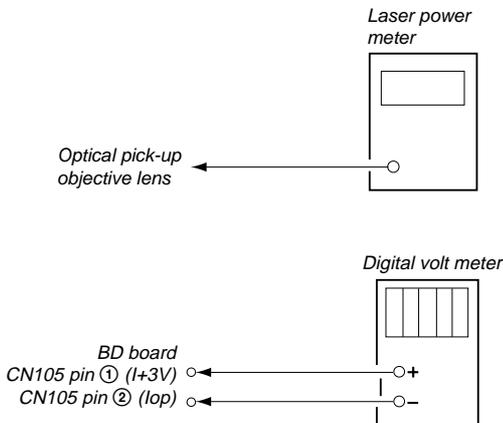
Checking Procedure:
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀◀ button or ▶▶ button to move the optical pick-up.)
   Connect the digital volt meter to CN105 pin ① (I+3V) and CN105 pin ② (Iop).
2. Then, rotate the ⊩◁◁ AMS ▷▷⊩ knob and display "LDPWR CHECK".
3. Press the YES button once and display "L 0.93 mW $ ▯▯". Check that the reading of the laser power meter become the specified value.
4. Press the YES button once more and display " L 7.25 mW $ ▯▯". Check that the reading the laser power meter and digital volt meter satisfy the specified value.

Specified Value :
Laser power meter reading : L 0.93mW: 0.85-0.91mW (260B)
                                       0.90-0.96mW (260E)
                            L 7.25mW: 6.80-7.20mW (260B)
                                       7.00-7.50mW (260E)

Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

KMS260B
20101
H0576

(For details of the method for checking this value, refer to "5-8. Recording and Displaying Iop Information".)

Iop = 57.6 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

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

Note 1: After step 4, each time the YES button is pressed, the display will be switched between "L 0.73 mW $ ▯▯", "L 6.40 mW $ ▯▯", and "L Wp ホセイ $ ▯▯". Nothing needs to be performed here.

5-6-3. Iop Compare

The current Iop value at laser power 7 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. Rotate the ⊩◁◁ AMS ▷▷⊩ knob to display "Iop Compare".
2. Press the YES button and start measurements.
3. When measurements complete, the display changes to
   Iop [STOP] ⟶ Iop [7.0mW] ⟶ "±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.

5-6-4. 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. 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 step 1.
2. 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.
3. If a disk is loaded at step 2, the check will start automatically.
4. When "XX CHECK" is displayed, the item corresponding to XX will be performed.
   When "06 CHECK" completes, the disc loaded at step 2 will be ejected. "DISC IN" will be displayed. Load the check disc (MD) TDYS-1.
5. When the disc is loaded, the check will automatically be resumed from "07 CHECK".
6. 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 the other spindle motor, thread motor, etc.

When displayed as "NG:xxxx", it means that the optical pick-up is faulty. In this case, replace the optical pick-up.

5-6-5. Other Checks

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

1. Load a continuously recorded test disc (MDW-74/GA-1). (Refer to "5-5. Using the Continuously Recorded Disc".)

5-6-6. Traverse Check
Connection :
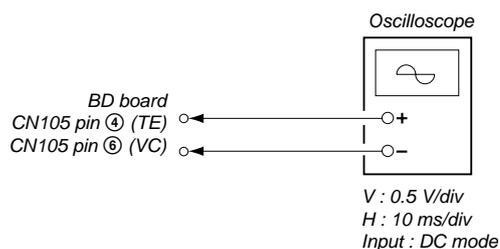
Checking Procedure:
1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) of the BD board.
2. Load a test disc (MDW-74/GA-1). (Refer to Note 1.)
3. Press the ▶▶ button and move the optical pick-up outside the pit.
4. Rotate the |◀◀ AMS ▶▶| knob and display "EF MO CHECK".
5. Press the YES button and 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 rotate the AMS knob. (Read power traverse checking)
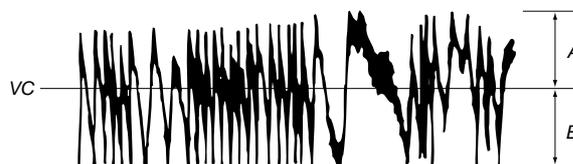
(Traverse Waveform)

Specified value : Below 10% offset value

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

7. Press the YES button and display "EFB = ▦ MO-W".
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the |◀◀ AMS ▶▶| knob.
   (Write power traverse checking)

(Traverse Waveform)
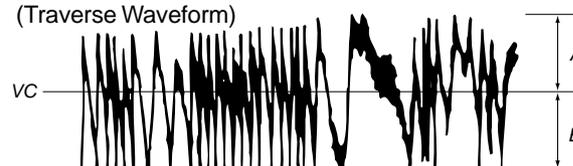
Specified value : Below 10% offset value

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

9. Press the YES button 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 rotate the |◀◀ AMS ▶▶| knob.

(Traverse Waveform)
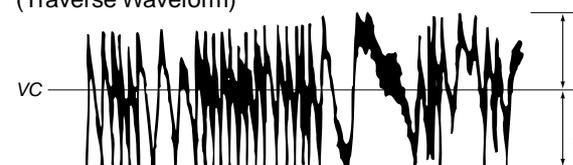
Specified value : Below 10% offset value

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

11. Press the YES button display "EF MO CHECK"
    The disc stops rotating automatically.
12. Press the ⏏ EJECT button and remove the disc.
13. Load the check disc (MD) TDYS-1.
14. Rotate the |◀◀ AMS ▶▶| knob and display "EF CD CHECK" (C04).
15. Press the YES button and display "EFB = ▦ CD". Servo is imposed automatically.

16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob.

(Traverse Waveform)

Specified value : Below 10% offset value

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

17. Press the $\boxed{\text{YES}}$ button and display "EF CD CHECK".
18. Press the $\boxed{\triangle\text{ EJECT}}$ button and remove the check disc (MD) TDYS-1.

Note 1 : MO reading data will be erased during 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.

5-6-7. Focus Bias Check
Change the focus bias and check the focus tolerance amount.
Checking Procedure :
1. Load a continuously recorded test disc (MDW-74/GA-1). (Refer to "5-5. Using the Continuously Recorded Disc".)
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and display "CPLAY1 MODE".
3. Press the $\boxed{\text{YES}}$ button and display "CPLAY1 MID".
4. The display change to "C = □□□□ AD = □□".
5. Press the $\boxed{\text{MENU/NO}}$ button and display "CPLAY1 MODE".
6. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and display "FBIAS CHECK".
7. Press the $\boxed{\text{YES}}$ button and display " □□□□/□□ c = □□".
   The first four digits indicate the C error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C error is below 50 and ADER is below 2.
8. Press the $\boxed{\text{YES}}$ button and display " □□□□/□□ b = □□".
   Check that the C error is below 100 and ADER is below 2.
9. Press the $\boxed{\text{YES}}$ button and display " □□□□/□□ a = □□".
   Check that the C error is below 100 and ADER is below 2.
10. Press the $\boxed{\text{MENU/NO}}$ button, next press the $\boxed{\triangle\text{ EJECT}}$ button, and remove the test disc.

5-6-8. C PLAY Check

MO Error Rate Check
Checking Procedure :
1. Load a continuously recorded test disc (MDW-74/GA-1). (Refer to "5-5. Using the Continuously Recorded Disc".)
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and display "CPLAY1 MODE".
3. Press the $\boxed{\text{YES}}$ button and display "CPLAY1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. If the C error rate is below 50, check that ADER is 2.
6. Press the $\boxed{\text{MENU/NO}}$ button, stop playback, press the $\boxed{\triangle\text{ EJECT}}$ button, and test disc.

CD Error Rate Check
Checking Procedure :
1. Load a check disc (MD) TDYS-1.
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob and display "CPLAY1 MODE".
3. Press the $\boxed{\text{YES}}$ button twice and display "CPLAY1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. Check that the C error rate is below 50.
6. Press the $\boxed{\text{MENU/NO}}$ button, stop playback, press the $\boxed{\triangle\text{ EJECT}}$ button, and the test disc.

5-6-9. Self-Recording/playback Check
Prepare a continuous recording disc using the unit to be repaired and check the error rate.

Checking Procedure :
1. Insert a recordable test disc (MDW-74/GA-1) into the unit.
2. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "CREC1 MODE".
3. Press the $\boxed{\text{YES}}$ button to display the "CREC1 MID".
4. When recording starts, " $\boxed{\textbf{REC}}$ " is displayed, this becomes "CREC 1 (@@@@)" (@@@@ is the address), and recording starts.
5. About 1 minute later, press the $\boxed{\text{MENU/NO}}$ button to stop continuous recording.
6. Rotate the $\boxed{\text{I◁◁ AMS ▷▷I}}$ knob to display "C PLAY MODE".
7. Press the $\boxed{\text{YES}}$ button to display "C PLAY1 MID".
8. "C = □□□□ AD = □□" will be displayed.
9. Check that the C error becomes below 50 and the AD error below 2.
10. Press the $\boxed{\text{MENU/NO}}$ button to stop playback, and press the $\boxed{\triangle\text{ EJECT}}$ button and remove the disc.

5-7. INITIAL SETTING OF ADJUSTMENT VALUE

Note:

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

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

For details of the initial setting, refer to "5-4. Precautions on Adjustments" and execute the initial setting before the adjustment as required.

Setting Procedure :
1. Rotate the |◁◁ AMS ▷▷| knob to display "ADJ CLEAR".
2. Press the |YES| button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" will be displayed.

5-8. RECORDING AND DISPLAYING THE Iop INFORMATION

The Iop data can be recorded in the non-volatile memory. The Iop value on the label of the optical pick-up 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. While pressing the |◁◁ AMS ▷▷| knob and |■| button, connect the power plug to the outlet, and release the |◁◁ AMS ▷▷| knob and |■| button.
2. Rotate the |◁◁ AMS ▷▷| knob to display "[Service]", and press the |YES| button.
3. Rotate the |◁◁ AMS ▷▷| knob to display "Iop.Write", 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 : Rotate the |◁◁ AMS ▷▷| knob.
   To select the digit : Press the |◁◁ AMS ▷▷| 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".

Display Procedure :
1. Rotate the |◁◁ AMS ▷▷| knob to display "Iop.Read".
2. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ indicates the Iop value labeled on the pick-up.
   ##.# indicates the Iop value after adjustment
3. To end, press the |◁◁ AMS ▷▷| button or |MENU/NO| button to display "Iop Read".

5-9. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

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

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

Adjusting Procedure :
1. Rotate the |◁◁ AMS ▷▷| knob and display "TEMP ADJUST".
2. Press the |YES| button and 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" display then. When the |MENU/NO| button is pressed, "TEMP ADJUST" will be displayed immediatelly.

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

5-10. LASER POWER ADJUSTMENT

Check the Iop value of the optical pick-up before adjustments. (Refer to 5-8. Recording and Displaying Iop Information.)
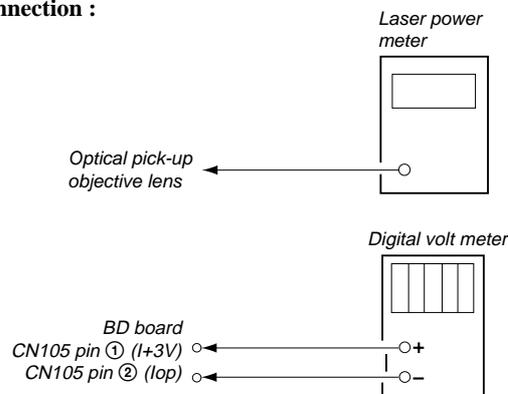
**Connection :**

Adjusting Procedure :
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the |◀◀| button or |▶▶| button to move the optical pick-up.)
   Connect the digital volt meter to CN105 pin ① (I+3V) and CN105 pin ② (Iop).
2. Rotate the |◁◁ AMS ▷▷| knob and display "LDPWR ADJUST".
   (Laser power : For adjustment)
3. Press the |YES| button once and display "L 0.93 mW $ ▨".
4. Rotate the |◁◁ AMS ▷▷| knob so that the reading of the laser power meter becomes the specified value. Press the |YES| button after setting the range knob of the laser power meter, and save the adjustment results. ("L SAVE $ ▨" will be displayed for a moment.)
5. Then "L 7.25 mW $ ▨" will be displayed.
6. Rotate the |◁◁ AMS ▷▷| knob so that the reading of the laser power meter becomes the specified value, press the |YES| button and save it.

Note : Do not perform the emission with 7.25 mW more than 15 seconds continuously.

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7. Then, rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob and display "LDPWR CHECK".

8. Press the $\boxed{\text{YES}}$ button once and display "L 0.93 mW $ ▯▯". Check that the reading of the laser power meter become the specified value.

9. Press the $\boxed{\text{YES}}$ button once more and display "L 7.25 mW $ ▯▯". Check that the reading the laser power meter and digital volt meter satisfy the specified value.
   Note down the digital voltmeter reading value.

Specified Value :
Laser power meter reading : L 0.93mW : 0.85-0.91mW (260B)
                                                         0.90-0.96mW (260E)
                                     L 7.25mW : 6.90-7.10mW (260B)
                                                         7.20-7.30mW (260E)

Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

```
KMS260B
20101
H0576
```
↑

Iop = 57.6 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

(For details of the method for checking this value, refer to "5-8. Recording and Displaying Iop Information".)

10. Press the $\boxed{\text{MENU/NO}}$ button and display "LDPWR CHECK" and stop the laser emission.
    (The $\boxed{\text{MENU/NO}}$ button is effective at all times to stop the laser emission.)

11. Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob to display "Iop.Write".

12. Press the $\boxed{\text{YES}}$ button. When the display becomes Ref = @@@.@ (@ is an arbitrary number), press the $\boxed{\text{YES}}$ 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 : Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob.
    To select the digit : Press the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob

14. When the $\boxed{\text{YES}}$ button is pressed, "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

Note 1: After step 4, each time the $\boxed{\text{YES}}$ button is pressed, the display will be switched between "L 0.73 mW $ ▯▯", "L 6.40 mW $ ▯▯", and "L Wp ホセイ $ ▯▯". Nothing needs to be performed here.

5-11. 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 OP and when replacing the IC701. Otherwise the OP check may deteriorate.

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

Procedure

1. Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob to display "Iop NV Save" (C06).

2. Press the $\boxed{\text{YES}}$ button and display "Iop [stop]".

3. After the display changes to "Iop =xxsave?", press the $\boxed{\text{YES}}$ button.

4. After "Complete!" is displayed momentarily, the display changes to "Iop 7.0 mW".

5. After the display changes to "Iop=yysave?", press the $\boxed{\text{YES}}$ button.

6. When "Complete!" is displayed, it means that Iop NV saving has been completed.

5-12. TRAVERSE ADJUSTMENT
Connection :
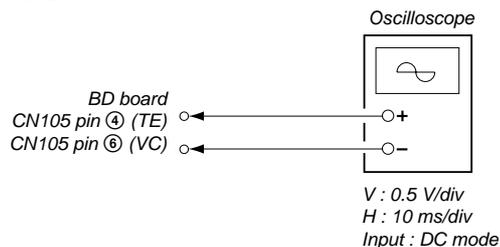
Oscilloscope

BD board
CN105 pin ④ (TE) ○———————○+
CN105 pin ⑥ (VC) ○———————○−

V : 0.5 V/div
H : 10 ms/div
Input : DC mode

Adjusting Procedure :

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) of the BD board.

2. Load a test disc (MDW-74/GA-1). (Refer to Note 1.)

3. Press the $\boxed{\blacktriangleright\blacktriangleright}$ button and move the optical pick-up outside the pit.

4. Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob and display "EF MO ADJUST".

5. Press the $\boxed{\text{YES}}$ button and display "EFB = ▯▯ MO-R".
   (Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)

6. Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob so that the waveform of the oscilloscope becomes the specified value.
   (When the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob is rotated, 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)

VC ———

A
B
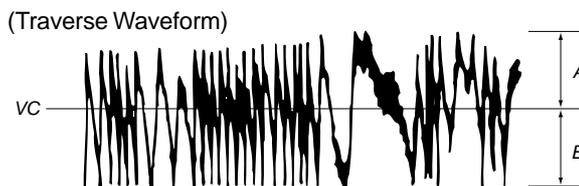
Specification A = B

7. Press the $\boxed{\text{YES}}$ 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. Rotate the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob so that the waveform of the oscilloscope becomes the specified value.
   (When the $\boxed{\mathbb{I}\triangleleft\triangleleft \text{ AMS } \triangleright\triangleright\mathbb{I}}$ knob is rotated, the ▯▯ of "EFB- ▯▯ MO-W" 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)
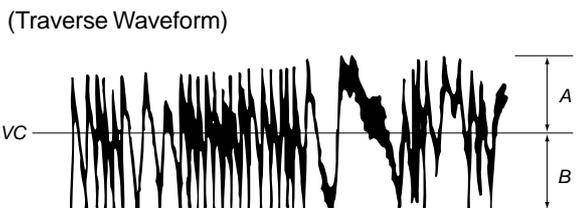
(Traverse Waveform)

VC ———

A
B

Specification A = B

9. Press the $\boxed{\text{YES}}$ 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. Rotate 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)
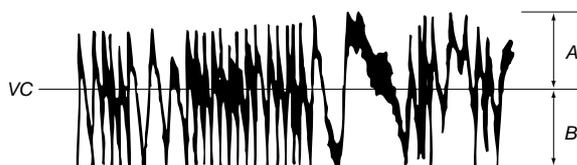
Specification A = B

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 ADJUS" is displayed. The disc stops rotating automatically.
13. Press the ⟨⏏ EJECT⟩ button and remove the disc.
14. Load the check disc (MD) TDYS-1.
15. Rotate ⟨I◁◁ AMS ▷▷I⟩ knob and display "EF CD ADJUST".
16. Press the ⟨YES⟩ button and display "EFB = ☐☐ CD". Servo is imposed automatically.
17. Rotate 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)
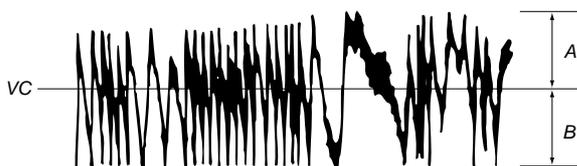
Specification A = B

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" will be displayed.
19. Press the ⟨⏏ EJECT⟩ button and remove the check disc (MD) TDYS-1.

Note 1 : MO reading data will be erased during 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.
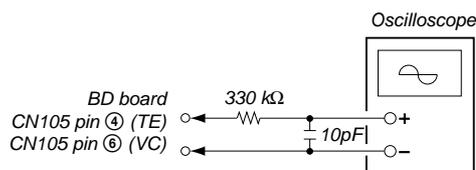
5-13. FOCUS BIAS ADJUSTMENT
Adjusting Procedure :
1. Load a test disk (MDW-74/GA-1).
2. Rotate the ⟨I◁◁ AMS ▷▷I⟩ knob and display "CPLAY1 MODE".
3. Press the ⟨YES⟩ button and display "CPLAY1 MID".
4. The display change to "C = ☐☐☐☐ AD = ☐☐".
5. Press the ⟨MENU/NO⟩ button and display "CPLAY1 MODE".
6. Rotate the ⟨I◁◁ AMS ▷▷I⟩ knob and display "FBIAS ADJUST".
7. Press the ⟨YES⟩ button and display " ☐☐☐☐/☐☐ a = ☐☐".
The first four digits indicate the C error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
8. Rotate the ⟨I◁◁ AMS ▷▷I⟩ knob in the clockwise direction and find the focus bias value at which the C error rate becomes 220 (Refer to Note 2).
9. Press the ⟨YES⟩ button and display " ☐☐☐☐/☐☐ b = ☐☐".
10. Rotate the ⟨I◁◁ AMS ▷▷I⟩ knob in the counterclockwise direction and find the focus bias value at which the C error rate becomes 220.
11. Press the ⟨YES⟩ button and display " ☐☐☐☐/☐☐ c = ☐☐".
12. Check that the C error rate is below 50 and ADER is 2. Then press the ⟨YES⟩ button.
13. 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.
14. Press the ⟨⏏ EJECT⟩ button to remove the test disc.

Note 1 : The relation between the C 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 C error rate changes, perform the adjustment using the average vale.
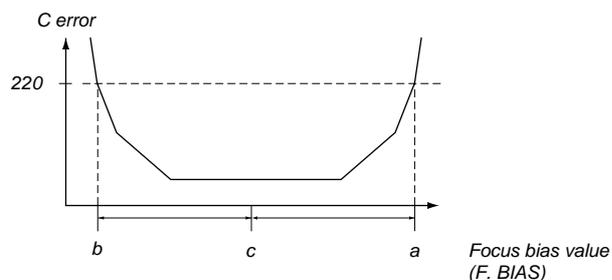
5-14. ERROR RATE CHECK
5-14-1. CD Error Rate Check

Checking Procedure :
1. Load a check disc (MD) TDYS-1.
2. Rotate the ⟨◁◁ AMS ▷▷⟩ knob and display "CPLAY1 MODE".
3. Press the ⟨YES⟩ button twice and display "CPLAY1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. Check that the C error rate is below 50.
6. Press the ⟨MENU/NO⟩ button, stop playback, press the ⟨⏏ EJECT⟩ button, and remove the test disc.

5-14-2. MO Error Rate Check

Checking Procedure :
1. Load a continuously recorded test disc (MDW-74/GA-1). (Refer to "5-5. Using the Continuously Recorded Disc".)
2. Rotate the ⟨◁◁ AMS ▷▷⟩ knob and display "CPLAY1 MODE".
3. Press the ⟨YES⟩ button and display "CPLAY1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. If the C error rate is below 50, check that ADER is 2.
6. Press the ⟨MENU/NO⟩ button, stop playback, press the ⟨⏏ EJECT⟩ button, and remove the test disc.

5-15. FOCUS BIAS CHECK
Change the focus bias and check the focus tolerance amount.
Checking Procedure :
1. Load a continuously recorded test disc (MDW-74/GA-1). (Refer to "5-5. Using the Continuously Recorded Disc".)
2. Rotate the ⟨◁◁ AMS ▷▷⟩ knob and display "CPLAY1 MODE".
3. Press the ⟨YES⟩ button twice and display "CPLAY1 MID".
4. The display change to "C = □□□□ AD = □□".
5. Press the ⟨MENU/NO⟩ button and display "CPLAY1 MODE".
6. Rotate the ⟨◁◁ AMS ▷▷⟩ knob and display "FBIAS CHECK".
7. Press the ⟨YES⟩ button and display " □□□□/□□ c = □□".
   The first four digits indicate the C error rate, the two digits after [/] indicate ADR, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C error is below 50 and ADER is below 2.
8. Press the ⟨YES⟩ button and display " □□□□/□□ b = □□".
   Check that the C error is below 100 and ADER is below 2.
9. Press the ⟨YES⟩ button and display " □□□□/□□ a = □□".
   Check that the C error is below 100 and ADER is below 2
10. Press the ⟨MENU/NO⟩ button, next press the ⟨⏏ EJECT⟩ button, and remove the continuously recorded disc.

Note 1 : If the C error and ADER are above other than the specified value at points a (step 9. in the above) or b (step 8. in the above), the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

5-16. 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.

5-16-1. CD Auto Gain Control Output Level Adjustment
Adjusting Procedure :
1. Insert the check disc (MD) TDYS-1.
2. Rotate the ⟨◁◁ AMS ▷▷⟩ knob to display "AG Set (CD)".
3. When the ⟨YES⟩ button is pressed, the adjustment will be performed automatically.
   "Complete!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (CD)".
4. Press the ⟨⏏ EJECT⟩ button to remove the disc.

5-16-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :
1. Insert the reference disc (MDW-74/GA-1) for recording.
2. Rotate the ⟨◁◁ AMS ▷▷⟩ knob to display "AG Set (MO)".
3. When the ⟨YES⟩ button is pressed, the adjustment will be performed automatically.
   "Complete!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)".
4. Press the ⟨⏏ EJECT⟩ button to remove the disc.

5-17. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)
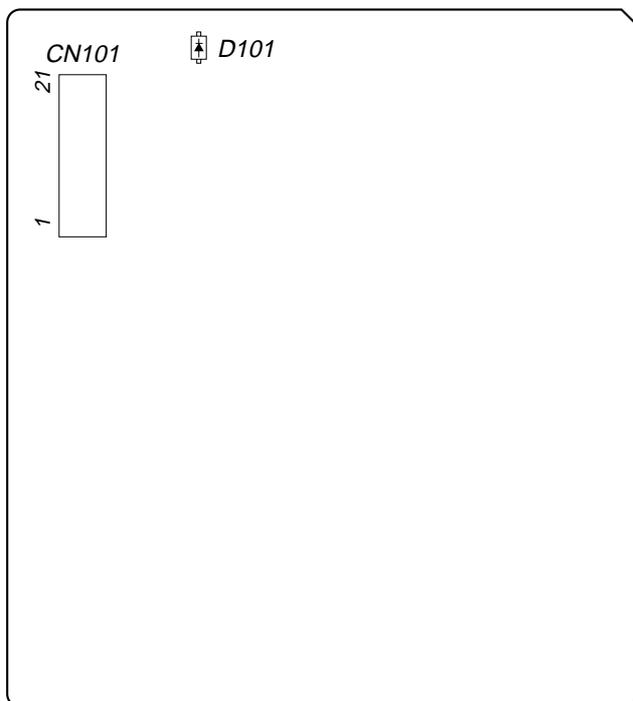
[BD BOARD] (SIDE B)
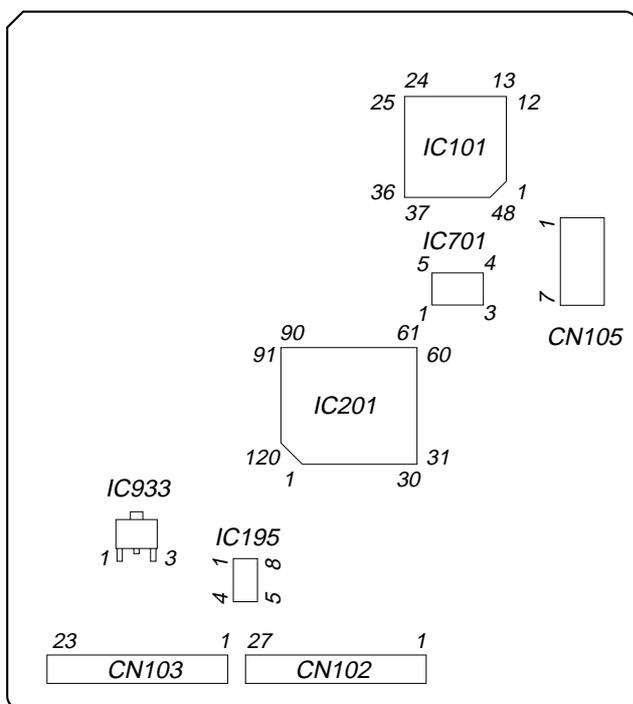
NOTE: It is useful to use the jig. for checking the waveform. (Refer to Servicing Note on page 6.)

MDS-JE480

6-1. CIRCUIT BOARDS LOCATION

PT board

KEY-SW board

MAIN board

DISPLAY board

BD board
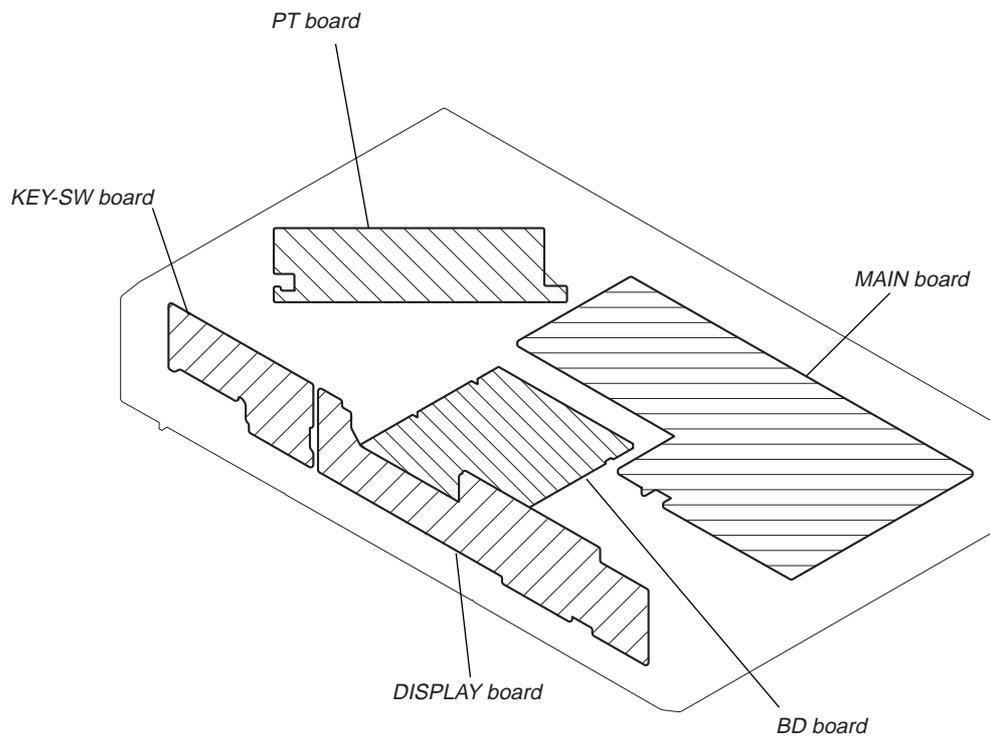
THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.
Note:
• 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.
• ☐ : 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.
• ▭ : adjustment for repair.
• Voltages and waveforms are dc with respect to ground
  under no-signal (detuned) 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 produc-
  tion tolerances.
• Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal produc-
  tion tolerances.
• Circled numbers refer to waveforms.
• Signal path.
  ⊃ : PB
  ▶ : REC
  ⧁ : REC (DIGITAL IN)

For printed wiring boards.
Note:
• ○▬▬ : parts extracted from the component side.
• ▬▬ : parts extracted from the conductor side.
• ○ : Through hole.
• ▬ : Pattern from the side which enables seeing.
(The other layers' patterns are not indicated.)

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

○ ⬡ ○
B C E   *These are omitted.*

○ ⬭ ○
B C E   *These are omitted.*

C
Q   *These are omitted.*
B E

• WAVEFORMS

– BD Board –

① IC101 ㉘ (TE)
   (Play mode)
   1.5Vp-p
   On track jumping

② IC101 ㉞ (FE)
   (Play mode)
   0.1Vp-p

③ IC101 ㊳ (RF)
   1.2Vp-p

④ IC803 ① (XIN)
   2Vp-p
   11.2896 MHz

⑤ IC201 ⑳ (OSCO)
   2.5Vp-p
   90.3 MHz

⑥ IC201 ㉞ (LRCK)
   3.2Vp-p
   23 µsec

⑦ IC201 ㉟ (XBCK)
   3.2Vp-p
   0.36 µsec

– MAIN Board –

① IC1 ⑬ (XOUT)
   2.7Vp-p
   10 MHz

② IC550 ①
   3.2Vp-p
   11.2896 MHz

– PANEL Board –

① IC760 ㊾ (OSC1)
   3.2Vp-p
   4.5 µsec
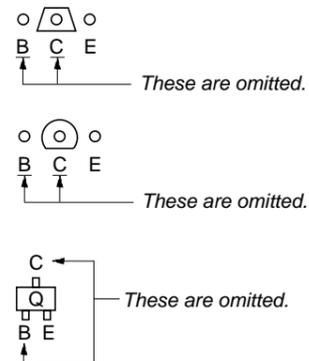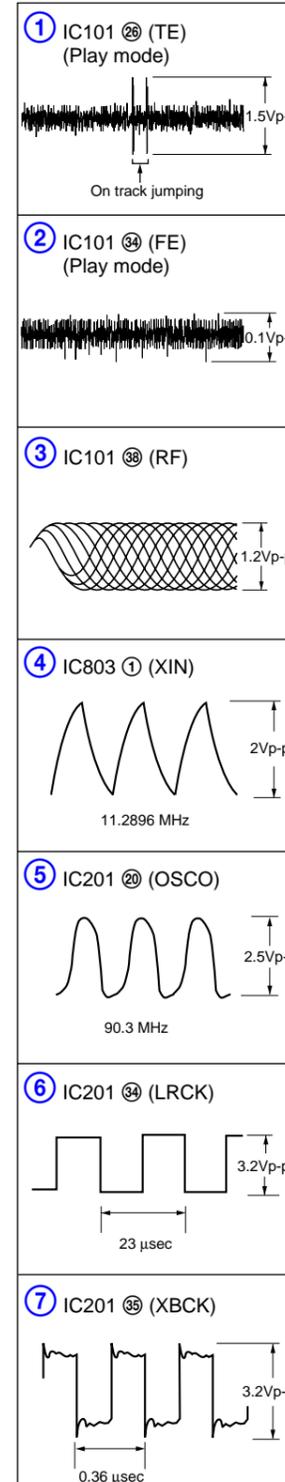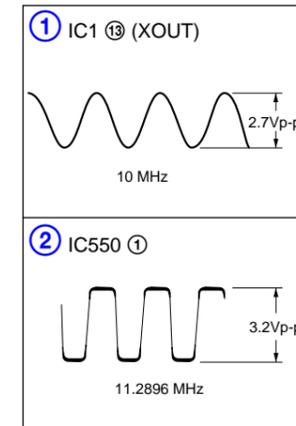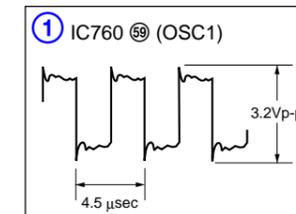
6-2. BLOCK DIAGRAMS – BD SECTION –

– MAIN SECTION –

A/D, D/A CONVERTER
IC500

SERIAL I/O INTERFACE

DECIMATION FILTER

ΔΣ MODULATOR

LIN — 2
RIN — 1

LINE AMP IC310

L R ANALOG IN

ADDT
(A) (Page38)

SDTO — 8

COMMON VOLTAGE

VCOM — 14

8X INTERPOLATOR

ΔΣ MODULATOR

LPF

LOUT — 15
ROUT — 16

LINE AMP IC360

L R ANALOG OUT

J300

DADT, BCK, LRCK
(B) (Page38)

SDTI — 9
BICK — 12
LRCK — 10

DADT
BCK
LRCK

CLOCK DIVIDER

MCLK — 11

OSC IC550

X550 11.2896MHz

MUTING Q181, 281

MUTING CONTROL SWITCH Q380

PD — 13
DEMO — 6

(C) (Page38)

REMOTE CONTROL RECEIVER IC781

D382   D381

• SIGNAL PATH
▷ : PLAY (ANALOG OUT)
◀ : REC (ANALOG IN)

SYSTEM CONTROLLER IC1 (2/2)

X15 10MHz

XIN — 15
XOUT — 13

ADA.LATCH — 39
EMF — 72
SIRCS — 4
MUTE — 38
STB — 81

FLDT — 1
FLCK — 2
FLCS — 84

JOG0 — 87
JOG1 — 88

KEY0 – KEY2
96,95,94

P DOWN — 19
S.RST — 12

TR950 POWER TRANSFORMER

IC600(2/2) BUFFER
6   9

RECT D431,432

RECT D401-404

+3.3V REGULATOR IC401

C769, R769

OSC

OSCI — 59
OSCO — 58

DAT — 63
CLK — 62
CS — 61

RST — 60

FL/LED DRIVER IC760

P1 — 1
P2 — 2

S1–S35 5 – 39
G1 – G12 40 – 51
G13 — 52

ROTARY ENCODER

A   B
1   3

GND   SW
5   4

S713
|◀◀ AMS ▶▶|
PUSH ENTER

+3.3V (SYS)
D409   D406
+3.3V (BACKUP)
D408   CN406

RESET VCC
3   5
IC406 RESET

BT406 LITHIUM BATTERY

AC (TO FL750)

TR900 POWER TRANSFORMER

D726 STANDBY

LED DRIVE Q726

S1 – S35

G1 – G12

FL DRIVE Q767

G13

FLUORESCENT INDICATOR TUBE FL750

AC

S701 – 706, 711, 712,
S714-716, 721 – 724,
S726

–32V (FL DRIVER (IC760) B–)

–32V REGULATOR Q427

RECT D421

D775 MD LP

LED DRIVE Q755

UNREG +12V

RECT D461, 462

LINE AMP (IC 310, 360)

UNREG –12V

RECT D466–467

RELAY DRIVE Q911

IC411 +5V REGULATOR

UNREG +12V LOADING MOTOR DRIVER (IC440) B+

VD/VA +3.3V (TO IC500)

+3.3V REGULATOR IC490

+5V

OUT   VIN
3   1

RECT D411,412

6-3. PRINTED WIRING BOARD – BD Board – • See page 36 for Circuit Board Location.

【BD BOARD】(SIDE A)

OPTICAL PICK-UP BLOCK (KMS-260B/260E)

HR901 OVER WRITE HEAD

1-683-807-

【BD BOARD】(SIDE B)

M103 LOADING MOTOR

M101 SPINDLE MOTOR

M102 SLED MOTOR

1-683-807-

B MAIN BOARD (Page 45)

A MAIN BOARD (Page 45)

• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D101	A-3	IC701	C-11	Q701	D-2
D501	E-12	IC803	E-5	Q702	C-3
D502	F-12	IC926	D-8	Q703	C-2
		IC933	E-8	Q704	C-3
IC101	B-11				
IC153	D-11	Q181	E-11		
IC181	F-11	Q182	F-11		
IC195	F-9	Q201	C-2		
IC201	D-10	Q202	C-11		
IC401	C-8	Q203	C-11		

6-4. SCHEMATIC DIAGRAM – BD SECTION (1/2) – • See page 49 for IC Pin Functions.

6-5. SCHEMATIC DIAGRAM – BD SECTION (2/2) – • See page 50 for IC Pin Functions.

6-6. SCHEMATIC DIAGRAM – MAIN SECTION (1/2) – • See page 53 for IC Pin Functions.
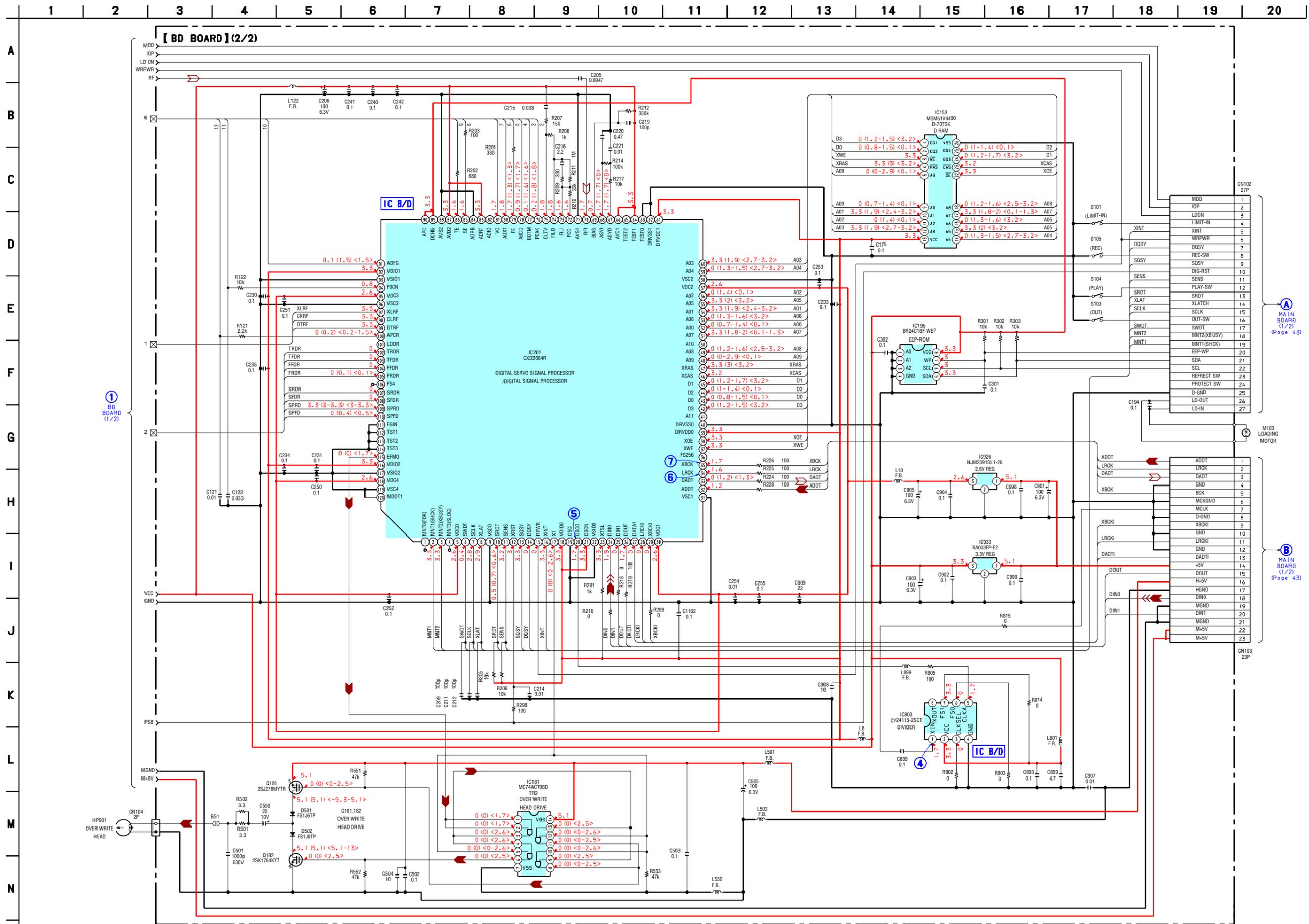
6-7. SCHEMATIC DIAGRAM – MAIN SECTION (2/2) –
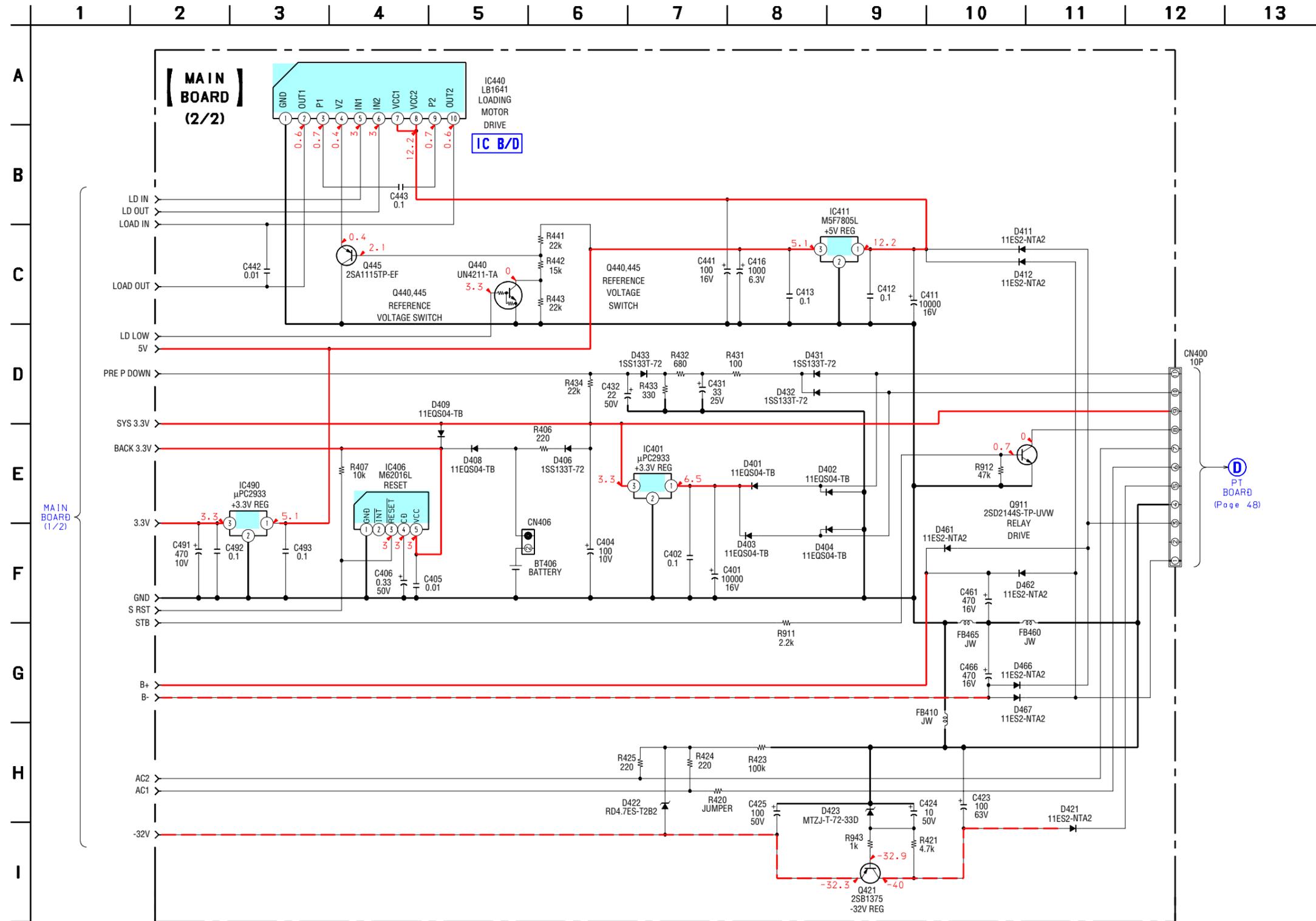
6-8. PRINTED WIRING BOARD – MAIN SECTION – • See page 36 for Circuit Board Location.
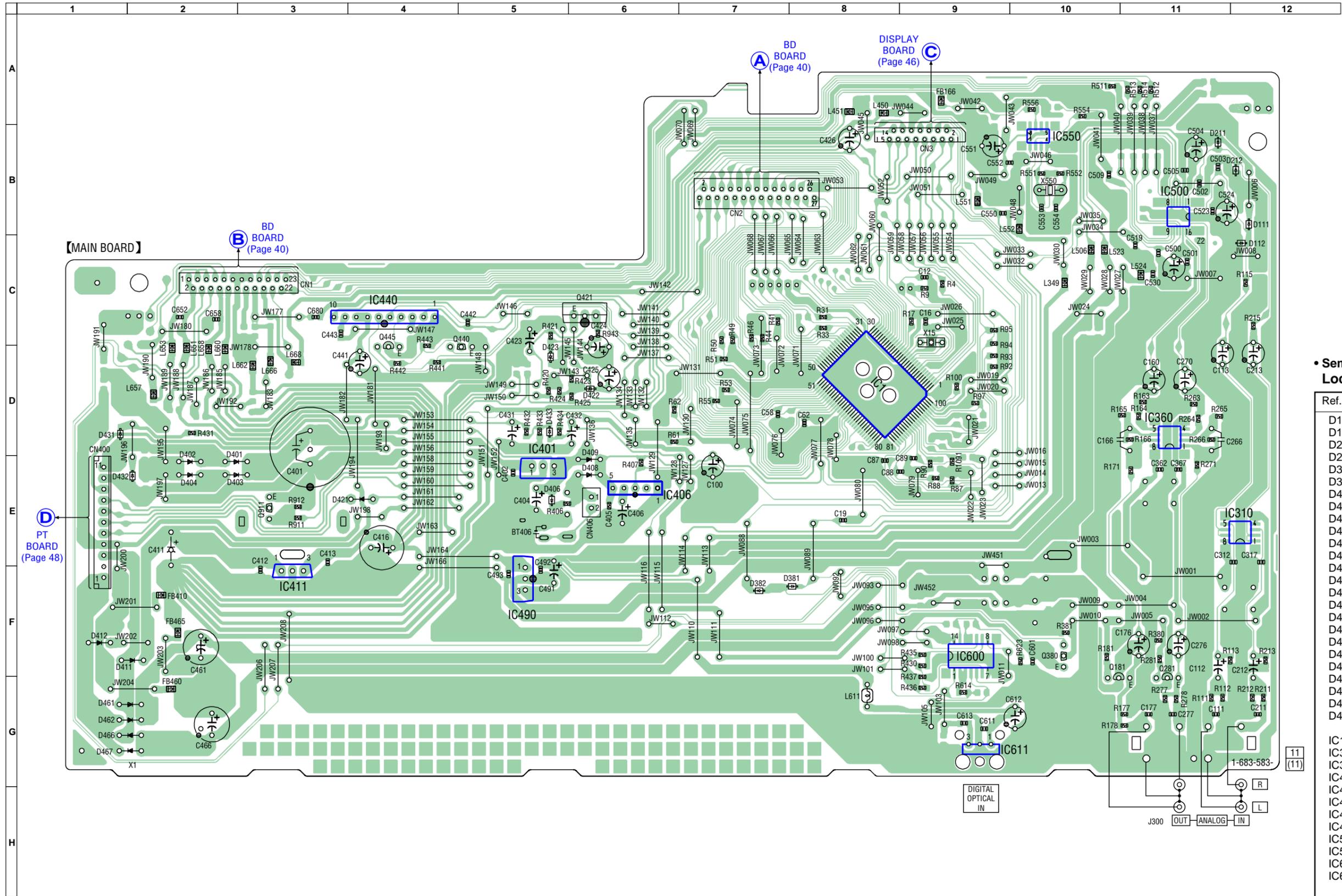
• Semiconductor Location

Ref. No.	Location
D111	B-12
D112	C-12
D211	B-11
D212	B-12
D381	F-8
D382	F-7
D401	E-2
D402	E-2
D403	E-2
D404	E-2
D406	E-5
D408	E-6
D409	E-6
D411	F-2
D412	F-1
D421	E-4
D422	D-6
D423	D-5
D431	D-1
D432	E-2
D433	D-5
D461	G-2
D462	G-2
D466	G-2
D467	G-2
IC1	D-8
IC310	E-12
IC360	D-11
IC401	E-5
IC406	E-6
IC411	F-3
IC440	C-4
IC490	F-5
IC500	B-11
IC550	B-10
IC600	F-9
IC611	G-9
Q181	G-10
Q281	G-11
Q380	F-10
Q421	C-6
Q440	D-5
Q445	D-4
Q911	E-3

【MAIN BOARD】

BD BOARD (Page 40) A

BD BOARD (Page 40) B

DISPLAY BOARD (Page 46) C

PT BOARD (Page 48) D

DIGITAL OPTICAL IN

J300 OUT ANALOG IN

R L

1-683-583-

11 (11)

45   45

6-9. PRINTED WIRING BOARD – DISPLAY SECTION – • See page 36 for Circuit Board Location.

【DISPLAY BOARD】

【KEY–SW BOARD】

MAIN
BOARD
(Page 45)

1-683-586-

1-683-587-
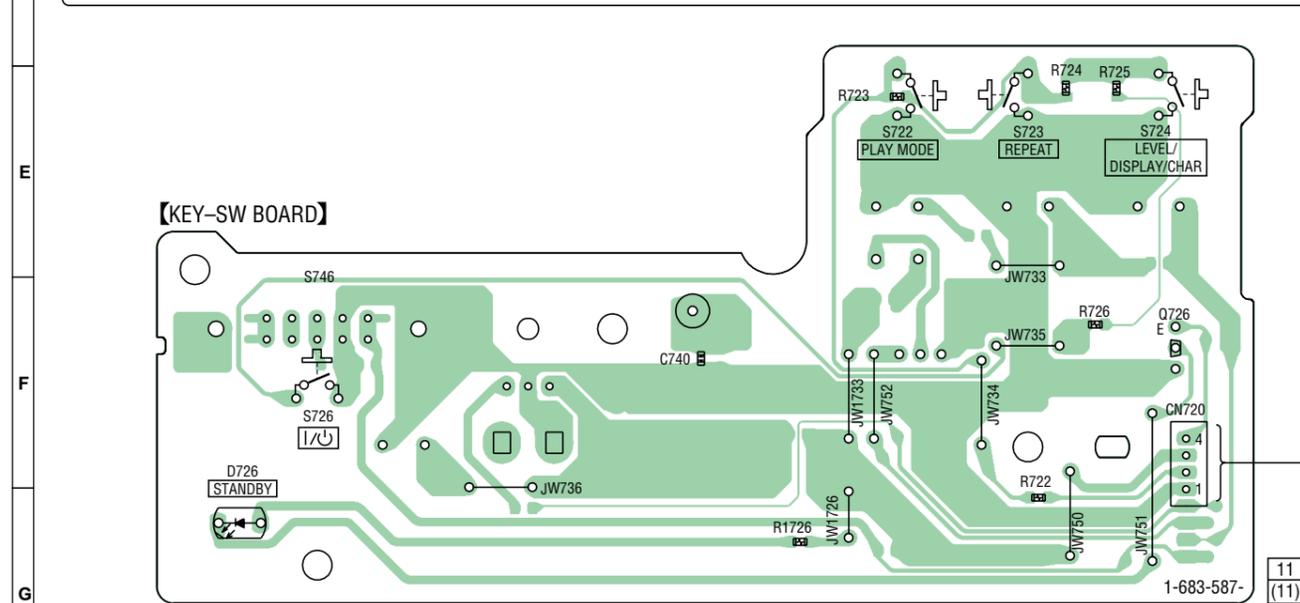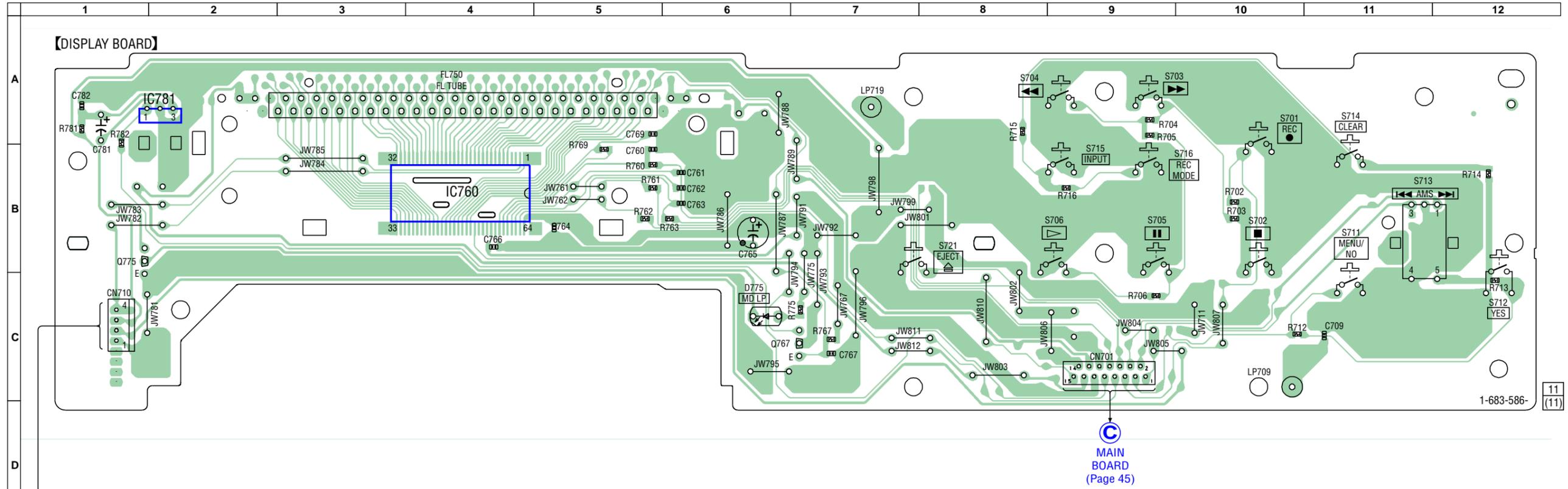
• Semiconductor Location

Ref. No.	Location
D726	G-1
D775	C-6
IC760	B-4
IC781	A-2
Q726	F-6
Q767	C-7
Q775	B-1

6-10. SCHEMATIC DIAGRAM – DISPLAY SECTION –

【KEY-SW BOARD】

【DISPLAY BOARD】

MDS-JE480
Ver 1.1 2003.04
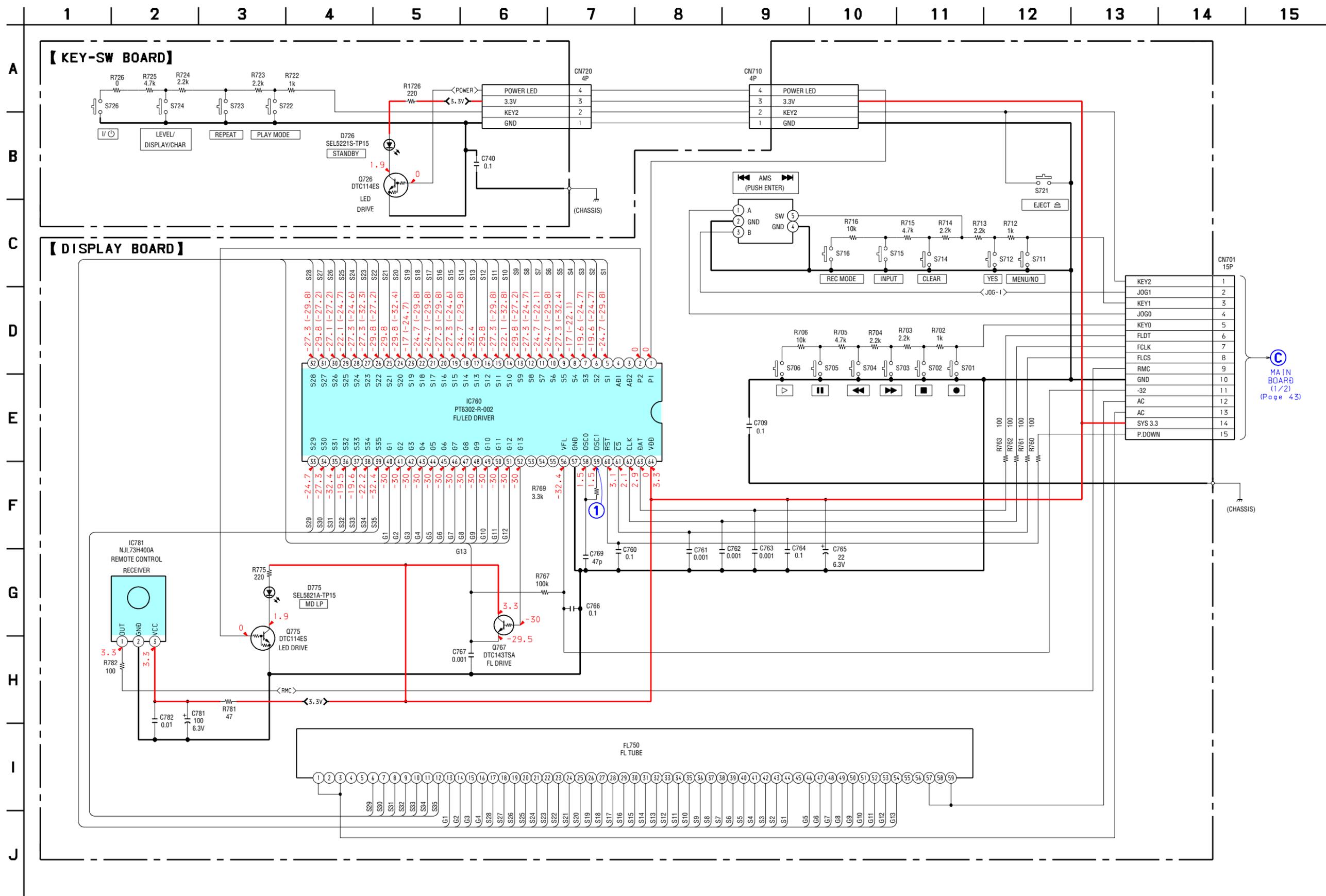
6-11. PRINTED WIRING BOARD – POWER SECTION – • See page 36 for Circuit Board Location.
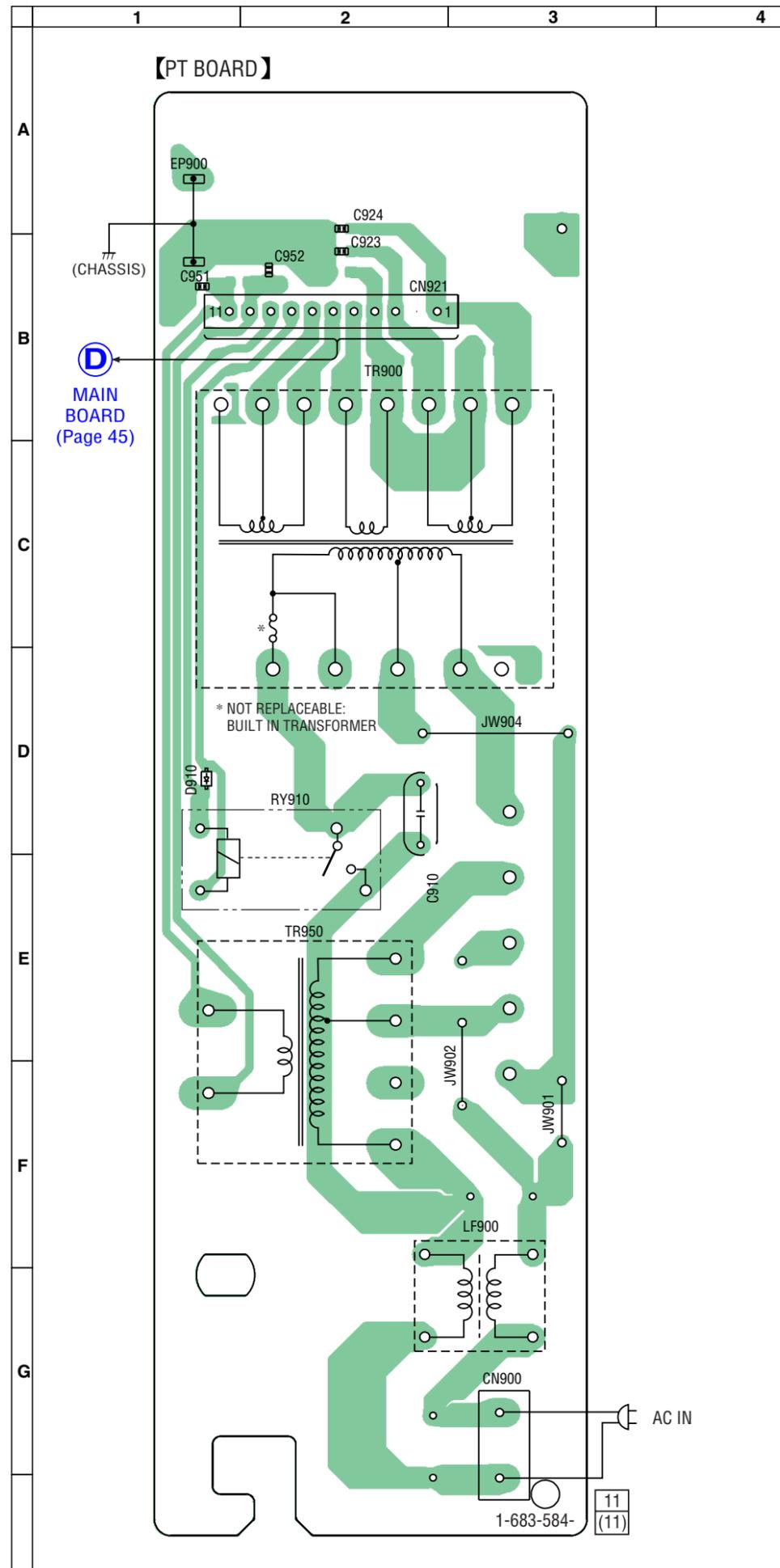
6-12. SCHEMATIC DIAGRAM – POWER SECTION –

【PT BOARD】

EP900

C924
C923
C952
C951

(CHASSIS)

CN921

11   1

MAIN
BOARD
(Page 45)

TR900

* NOT REPLACEABLE:
  BUILT IN TRANSFORMER

JW904

D910

RY910

C910

TR950

JW902

JW901

LF900

CN900

AC IN

1-683-584-

11
(11)

【PT BOARD】

TR950

C951
0.1

C952
0.1

TR900

JW904

JW901

C910
0.0022
250V

CN900
2P

AC IN

LF900
LINE FILTER

* NOT REPLACEABLE:
  BUILT IN TRANSFORMER

C923
0.1

C924
0.1

RY910
RELAY

D910
1SS133T-72

EP900
EARTH PLATE

CN921
WIRE
10P

(CHASSIS)

MAIN
BOARD
(2/2)
(Page 44)

48   48

6-13. IC PIN FUNCTION DESCRIPTION

• **IC101 CXA2523AR RF Amplifier (BD BOARD)**

Pin No.	Pin Name	I/O	Description
1	I	I	I-V converted RF signal I input
2	J	I	I-V converted RF signal J input
3	VC	O	Middle point voltage generation output
4 - 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input
11	APC	O	Laser APC output
12	APCREF	I	Reference voltage input for setting laser power
13	GND	—	Ground
14	TEMPI	I	Temperature sensor connection
15	TEMPR	O	Reference voltage output for the temperature sensor
16	SWDT	I	Serial data input from the CXD2664R
17	SCLK	I	Serial clock input from the CXD2664R
18	XLAT	I	Latch signal input from the CXD2664R "L": Latch
19	XSTBY	I	Stand by signal input "L": Stand by
20	F0CNT	I	Center frequency control voltage input of BPF22, BPF3T, EQ from the CXD2664R
21	VREF	O	Reference voltage output (Not used)
22	EQADJ	I	Center frequency setting pin for the internal circuit EQ
23	3TADJ	I	Center frequency setting pin for the internal circuit BPF3T
24	Vcc	—	Power supply
25	WBLADJ	I	Center frequency setting pin for the internal circuit BPF22
26	TE	O	Tracking error signal output to the CXD2664R
27	CSLED	—	External capacitor connection pin for the sled error signal LPF
28	SE	O	Sled error signal output to the CXD2664R
29	ADFM	O	FM signal output of ADIP
30	ADIN	I	ADIP signal comparator input ADFM is connected with AC coupling
31	ADAGC	—	External capacitor connection pin for AGC of ADIP
32	ADFG	O	ADIP duplex signal output to the CXD2664R
33	AUX	O	I3 signal/temperature signal output to the CXD2664R
34	FE	O	Focus error signal output to the CXD2664R
35	ABCD	O	Light amount signal output to the CXD2664R
36	BOTM	O	RF/ABCD bottom hold signal output to the CXD2664R
37	PEAK	O	RF/ABCD peak hold signal output to the CXD2664R
38	RF	O	RF equalizer output to the CXD2664R
39	RFAGC	—	External capacitor connection pin for the RF AGC circuit
40	AGCI	I	Input to the RF AGC circuit The RF amplifier output is input with AC coupling
41	COMPO	O	User comparator output (Not used)
42	COMPP	I	User comparator input (Fixed at "L")
43	ADDC	—	External capacitor pin for cutting the low band of the ADIP amplifier
44	OPO	O	User operation amplifier output (Not used)
45	OPN	I	User operation amplifier inversion input (Fixed at "L")
46	RFO	O	RF amplifier output
47	MORFI	I	Groove RF signal is input with AC coupling
48	MORFO	O	Groove RF signal output

• Abbreviation
  APC: Auto Power Control
  AGC: Auto Gain Control

• IC201 CXD2664R Digital Signal Processor, Digital Servo Signal Processor (BD BOARD)

Pin No.	Pin Name	I/O	Desription
1	MNT0 (FOK)	O	Not used (open)
2	MNT1 (SHCK)	O	Track jump detection signal output to the system control
3	MNT2 (XBUSY)	O	In the state of executire command signal output
4	MNT3 (SLOC)	O	Not used (open)
5	VDC0	—	Power supply
6	SWDT	I	Serial data input from the system control
7	SCLK	I	Serial clock signal input from the system control
8	XLAT	I	Serial latch signal input from the system control
9	VSC0	—	Ground
10	SRDT	O (3)	Serial reading data output to the system control
11	SENS	O (3)	Internal status (SENSE) output to the system control
12	XRST	I	Reset signal input from the system control "L": Reset
13	SQSY	O	Subcode Q sync (SCOR) output to the system control
14	DQSY	O	Digital In U-bit CD format or MD format subcode Q sync (SCOR) output to the system control
15	RPWR	I	Laser power switching input from the system control "H": Recording, "L": Playback
16	XINT	O	Interrupt status output to the system control
17	TX	O	Recording data output enable input from the system control
18	VDIO0	—	Power supply
19	OSCI	I	System clock input (Fixed at "L")
20	OSCO	I/O	System clock input (Input terminal during OSCN:"H")
21	OSCN	I	Internal oscillating circuit control signal input
22	VSIO0	—	Ground
23	XTSL	I	System clock frequency setting
24	DIN0	I	Digital audio input (Optical input)
25	DIN1	I	Digital audio input (Optical input) (Not used)
26	DOUT	O	Digital audio output (Optical output) (Not used)
27	DADTI	I	Serial data input
28	LRCKI	I	LR clock input
29	XBCKI	I	Serial data bit clock input
30	VDC1	—	Power supply
31	VSC1	—	Ground
32	ADDT	I	Data input from the A/D converter
33	DADT	O	Data output to the D/A converter
34	LRCK	O	LR clock output for the A/D and D/A converter
35	XBCK	O	Bit clock output to the A/D and D/A converter
36	FS256	O	256Fs clock output (Not used)
37	XWE	O	Write enable signal output for DRAM
38	XOE	O	Read enable output for DRAM
39	DRVDD0	—	Power supply
40	DRVSS0	—	Ground
41	A11	O	DRAM address output (Not used) (Open)
42	D3	I/O	
43	D0	I/O	Data input/output for DRAM
44	D2	I/O	
45	D1	I/O	

* O (3) for 3-state output in the column I/O

Pin No.	Pin Name	I/O	Description
46	XCAS	O	CAS signal output for DRAM
47	XRAS	O	RAS signal output for DRAM
48	A09	O	DRAM address output
49	A08	O	
50	A10	O	Not used (Open)
51	A07	O	DRAM address output
52	A00	O	
53	A06	O	
54	A01	O	
55	A05	O	
56	A02	O	
57	VDC2	—	Power supply
58	VSC2	—	Ground
59	A04	O	DRAM address output
60	A03	O	DRAM address output
61	DRVDD1	—	Power supply
62	DRVSS1	—	Ground
63	TEST0	I	Not used (Fixed at "L")
64	TEST1	I	Not used (Fixed at "H")
65	TEST2	I	Not used (Open)
66	AVD1	—	Power supply
67	ASYO	O	Play back EFM duplex signal output
68	ASYI	I (A)	Play back EFM comparator slice level input
69	BIAS	I (A)	Play back EFM comparator bias current input
70	RFI	I (A)	Play back EFM RF signal input
71	AVS1	—	Ground
72	PCO	O (3)	Phase comparison output for the recording/playback EFM master PLL
73	FILI	I (A)	Filter input for the recording/playback EFM master PLL
74	FILO	O (A)	Filter output for the recording/playback EFM master PLL
75	CLTV	I (A)	Internal VCO control voltage input for the recording/playback EFM master PLL
76	PEAK	I (A)	Light amount signal peak hold input
77	BOTM	I (A)	Light amount signal bottom hold input
78	ABCD	I (A)	Light amount signal input
79	FE	I (A)	Focus error signal input from the CXA2523AR
80	AUX1	I (A)	Auxiliary A/D input
81	VC	I (A)	Middle point voltage input from the CXA2523AR
82	ADIO	O (A)	Monitor output of the A/D converter input signal (Not used) (Open)
83	ADRT	I (A)	A/D converter operational range upper limit voltage input (Fixed at "H")
84	ADRB	I (A)	A/D converter operational range lower limit voltage input (Fixed at "L")
85	SE	I (A)	Sled error signal input from the CXA2523AR
86	TE	I (A)	Tracking error signal input from the CXA2523AR
87	AVD2	—	Power supply
88	AVS2	—	Ground
89	DCHG	I (A)	Connected to +3V power supply
90	APC	I	APC error signal input (Not used) (Fixed at "H")
91	ADFG	I	ADIP duplex FM signal input from the CXA2523AR

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

• Abbreviation
  EFM: Eight to Fourteen Modulation
  PLL : Phase Locked Loop
  VCO: Voltage Controlled Oscillator

Pin No.	Pin Name	I/O	Description
92	VDIO1	—	Power supply
93	VSIO1	—	Ground
94	F0CNT	O	Filter f0 control output to the CXA2523AR
95	VDC3	—	Power supply
96	VSC3	—	Ground
97	XLRF	O	Control latch output to the CXA2523AR
98	CLRF	O	Control clock output to the CXA2523AR
99	DTRF	O	Control data output to the CXA2523AR
100	APCR	O	Reference PWM output for the laser APC
101	LDDR	O	PWM output for the laser digital APC (Not used) (Open)
102	TRDR	O	Tracking servo drive PWM output (–)
103	TFDR	O	Tracking servo drive PWM output (+)
104	FFDR	O	Focus servo drive PWM output (+)
105	FRDR	O	Focus servo drive PWM output (–)
106	FS4	O	4Fs clock signal output (Not used) (Open)
107	SRDR	O	Sled servo drive PWM output (–)
108	SFDR	O	Sled servo drive PWM output (+)
109	SPRD	O	Spindle servo drive PWM output (–)
110	SPFD	O	Spindle servo drive PWM output (+)
111	FGIN	I	Spindle CAV servo FG signal input
112-114	TST1 to TST3	I	Test input (Fixed at "L")
115	EFMO	O	EFM output when recording
116	VDIO2	—	Power supply
117	VSIO2	—	Ground
118	VDC4	—	Power supply
119	VSC4	—	Ground
120	MDDT1	I	MD data mode1 switching signal input (Fixed at "L")

• Abbreviation
  EFM: Eight to Fourteen Modulation

• IC1 M30622MGN-373FP SYSTEM CONTROL (MAIN BOARD)

Pin No.	Pin Name	I/O	Description
1	FLDT	O	Serial data output to the display driver
2	FLCK	O	Serial clock signal output to the display driver. L: Active
3	A1-IN	I	A1 Control input (Not used) (Open)
4	SIRCS	I	Remote control input
5 - 7	NC	—	Not used
8	BYTE	I	Data bus changed input (Fixed at "L")
9	CNVSS	—	Ground
10	XIN-T	I	Not used (Open)
11	XOUT-T	O	Not used (Open)
12	S.RST	I	System rest input
13	XOUT	O	Main clock output (10MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (10MHz)
16	VCC	—	Power supply
17	NMI	I	Fixed at H (Fixed at "H")
18	DQSY	I	Digital in sync input (Record system)
19	P.DOWN	I	Power down detection input L: Power down
20	SQSY	I	ADIP (MO) sync or subcode Q (PIT) sync input from CXD2664R (Playback system)
21	(KB.CLK)	I	Keyboard clock input (Not used) (Open)
22	(KB.DATA)	I	Keyboard data input (Not used) (Open)
23	(IIC BUSY)	I	IIC cable connect check (Not used) (Open)
24	(A1 OUT)	O	A1 control output (Not used) (Open)
25	XINIT	I	Interrupt status input from CXD2664R
26	*BEEP	O	Not used (Open)
27	(LRCKI)	O	Not used (Open)
28	(IIC POWER)	O	Not used (Open)
29	(IIC CLK)	O	Not used (Open)
30	(IIC DATA)	I/O	Not used (Open)
31	SWDT	O	Writing data signal output to the serial bus
32	SRDT	I	Reading data signal input from the serial bus
33	SCLK	O	Clock signal output to the serial bus
34	(KB.CLK-CTRL)	O	Keyboard clock ON/OFF signal output (Not used) (Open)
35	(CLIP-TX)	O	Not used (Open)
36	(CLIP-RX)	I	Not used (Open)
37	(XBCK1)	O	Not used (Open)
38	MUTE	O	Line out muting output
39	ADA.RESET	O	Reset signal output to the AK4552
40	ADA. LATCH	O	Latch signal output to the AK4552 (Not used) (Open)
41	EPN	I	Not used (Fixed at L)
42	(L : DINT1/H : CLIP)	O	Not used (Open)
43	NC	O	Not used (Open)
44	PROTECT	I	Recording-protection claw detection input from the protection detection switch H: Protect
45	SCL	O	Clock signal output to the EEP-ROM
46	CE	O	Not used (Pull-up)
47	EEP-WP	O	EEP-ROM write protect signal output L: write possibility
48	XBUSY	I	In the state of executive command from the CXD2664R

Pin No.	Pin Name	I/O	Description
49	OUT-SW	I	Detection signal input from the loading out detection switch
50	XLATCH	O	Latch signal output to the serial bus
51	PLAY-SW	I	Detection signal input from the playback position detection switch L: PLAY
52	DIG-RST	O	Digital rest signal output to the CXD2664R and motor driver
53	REC-SW	I	Detection signal input from the recording position detection switch L: REC
54	WR PWR	O	Write power ON/OFF output
55	LIMIT-IN	I	Detection input from the limit switch L: Sled limit-In H: Sled limit-Out
56	MOD	O	Laser modulation switching signal output
57	LDON	O	Laser ON/OFF control output
58	SENS	I	Internal status (SENSE) input from the CXD2664R
59	SHCK	I	Track jump signal input from the CXD2664R
60	SDA	I/O	Serial data input/output pin with the EEP-ROM
61	REFLECT	I	Disk reflection rate detection input from the reflect detection switch. H: Disk with low reflection rate
62	VCC	—	Power supply
63	NC	O	Not used (Open)
64	GND	—	Ground
65	LOAD LO	O	Loading motor voltage control output
66	LOAD OUT	O	Loading motor control output H: eject
67	LOAD IN	O	Loading motor control output H: loading
68 - 71	MODEL SEL 0 - 3	O	Not used (Open)
72	EMF	O	Deemphasis control signal output to the AK4552
73 - 80	NC	O	Not used (Open)
81	STB	O	Strobe signal output to the power supply circuit H: Power supply ON: L: standby
82	BEEP SW	O	Not used (Open)
83	REC	O	Not used (Open)
84	FLCS	O	Chip select signal output to the MSM9202
85, 86	D.VOL0,1	O	Not used (Open)
87, 88	JOG0, JOG1	I	Jog dial pulse input from the rotary encoder
89	IOP	I	Optical Pick-up voltage (current) detect signal input
90	DISTINATION	I	Model discrimination
91	MODEL SEL	I	Model discrimination
92	TIMER	I	Not used (Open)
93	KEY3	I	Not used (Fixed at "H")
94, 95	KEY2, 1	I	Key input pin (A/D input)
96	AVSS	—	Ground
97	KEY0	I	Key input pin (A/D input)
98	VREF	I	A/D reference voltage (Fixed at "H")
99	AVCC	—	Power supply
100	NC	I	Not used (Fixed at "L")

6-14. IC BLOCK DIAGRAMS
IC101   CXA2523AR (BD BOARD)

MDS-JE480
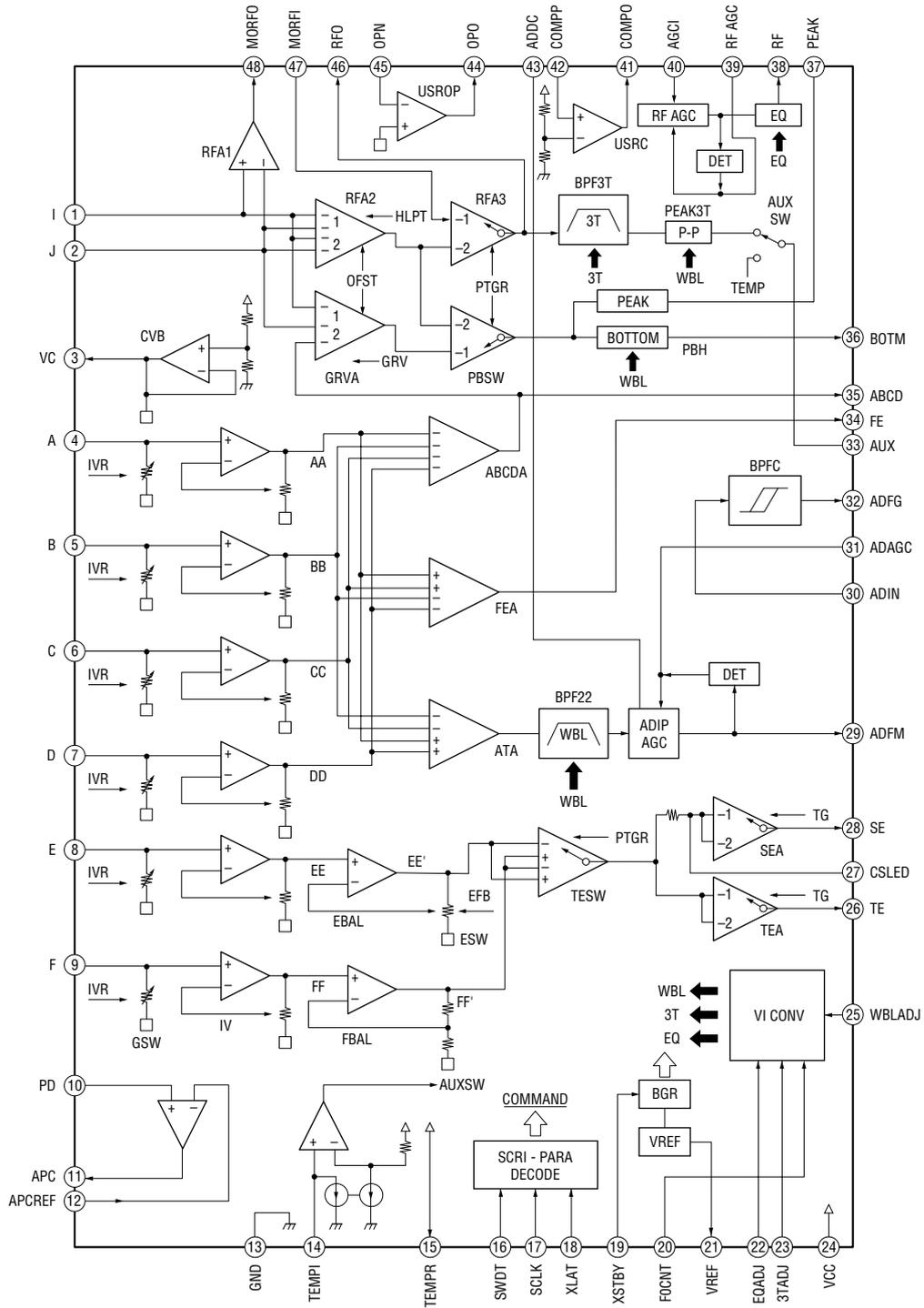
IC201　CXD2664R (BD BOARD)
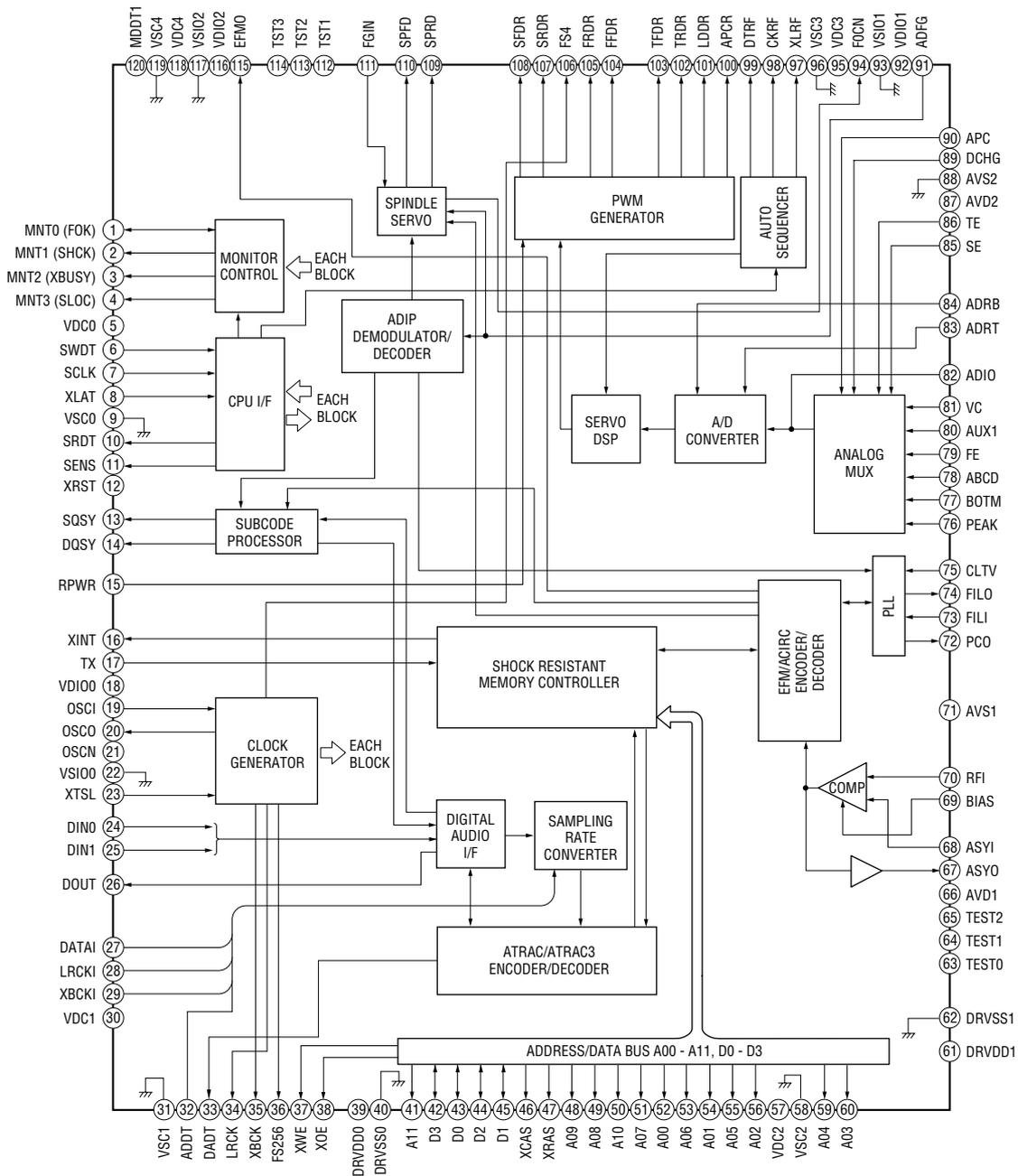
IC401　BH6519FS-E2 (BD BOARD)

56
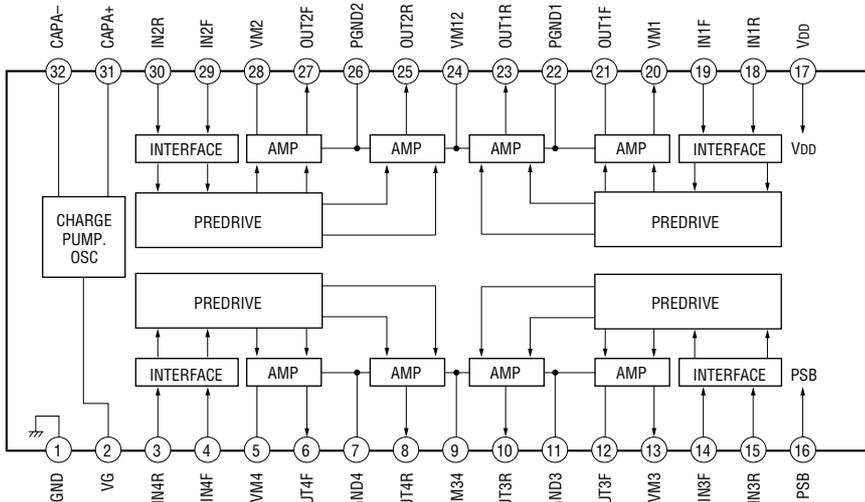
IC803   CY24115-2SCT (BD BOARD)
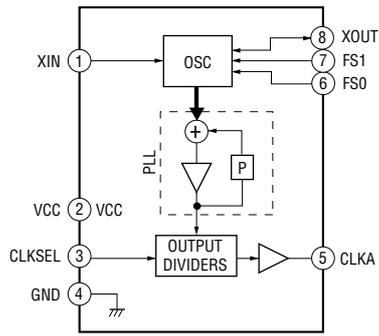
IC440   LB1641 (MAIN BOARD)
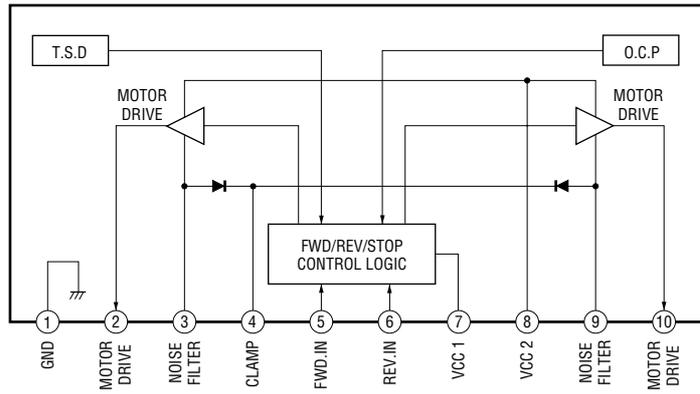
IC500   AK4552VT-E2 (MAIN BOARD)

MDS-JE480

Ver. 1.4

NOTE:
• -XX, -X mean standardized parts, so they may have some differences from the original one.
• Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
• The mechanical parts with no reference number in the exploded views are not supplied.
• Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

SECTION 7
EXPLODED VIEWS

• Color indication of Appearance Parts
Example :
KNOB, BALANCE (WHITE)··· (RED)
　　　　　　　　　　　↑　　　　↑
　　　　　Parts color　Cabinet's color
• Abbreviation
RU: Russian model

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

7-1. CHASSIS SECTION

Ref. No.	Part No.	Description	Remarks
1	X-4953-448-1	FOOT ASSY	
2	4-232-237-01	FOOT (DIA. 30)	
3	4-977-358-01	CUSHION	
4	3-531-576-41	RIVET (DIA. 3), NYLON	
5	1-683-584-11	PT BOARD	
6	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
7	4-231-555-01	INSULATOR	
8	4-228-643-11	SCREW (+BVTTWH M3), STEP	
9	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)	
* 11	3-703-244-00	BUSHING (2104), CORD	
⚠12	1-777-071-63	CORD, POWER (AEP, UK, RU)	
⚠12	1-783-532-32	CORD, POWER (US)	
13	A-4727-954-A	MAIN BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remarks
* 14	1-569-972-21	SOCKET, SHORT 2P	
15	3-363-099-11	SCREW (CASE 3 TP2)	
		...(SILVER: for Hair-line Finish) (AEP, UK, RU)	
15	4-210-291-01	SCREW (CASE 3 TP2)...(BLACK)	
15	4-210-291-11	SCREW (CASE 3 TP2)...(SILVER) (AEP, UK, RU)	
16	2-660-400-31	CASE...(SILVER: for Hair-line Finish)	
		(AEP, UK, RU)	
16	4-232-149-31	CASE (408226)...(BLACK)	
16	4-232-580-31	CASE (408226)...(SILVER) (AEP, UK, RU)	
17	3-937-248-01	CUSHION (A)	
⚠TR900	1-435-543-11	TRANSFORMER, POWER (US)	
⚠TR900	1-435-544-11	TRANSFORMER, POWER (AEP, UK, RU)	
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	

7-2. FRONT PANEL SECTION

Ref. No.	Part No.	Description	Remarks
51	X-2103-027-1	FRONT PANEL ASSY...(SILVER : Hair-line Finish) (AEP, UK, RU)	
51	X-4954-486-2	FRONT PANEL ASSY...(BLACK) (AEP, UK, RU)	
51	X-4954-487-1	FRONT PANEL ASSY...(SILVER) (AEP, UK, RU)	
51	X-4955-740-1	FRONT PANEL ASSY...(BLACK) (US)	
52	4-231-928-01	KNOB (AMS)...(BLACK)	
52	4-231-928-11	KNOB (AMS)...(SILVER) (AEP, UK, RU)	
52	4-231-928-31	KNOB (AMS)...(SILVER : for Hair-line Finish) (AEP, UK, RU)	
53	3-354-981-11	SPRING (SUS), RING	
54	4-951-620-01	SCREW (2.6X8), +BVTP	

Ref. No.	Part No.	Description	Remarks
55	1-757-929-11	WIRE (FLAT TYPE) (15 CORE)	
56	4-228-630-01	SPRING (LID), TENSION COIL	
57	4-228-629-21	LID (MD)...(SILVER) (AEP, UK, RU)	
57	4-228-629-81	LID (MD)...(BLACK)	
58	1-683-587-11	KEY-SW BOARD	
59	A-4727-955-A	DISPLAY BOARD, COMPLETE	
60	4-949-935-41	CUSHION (FL)	
61	4-212-590-22	HOLDER (FL)	
FL750	1-517-986-11	INDICATOR TUBE, FLUORESCENT	

7-3. MECHANISM SECTION-1
(MDM-7S1A)
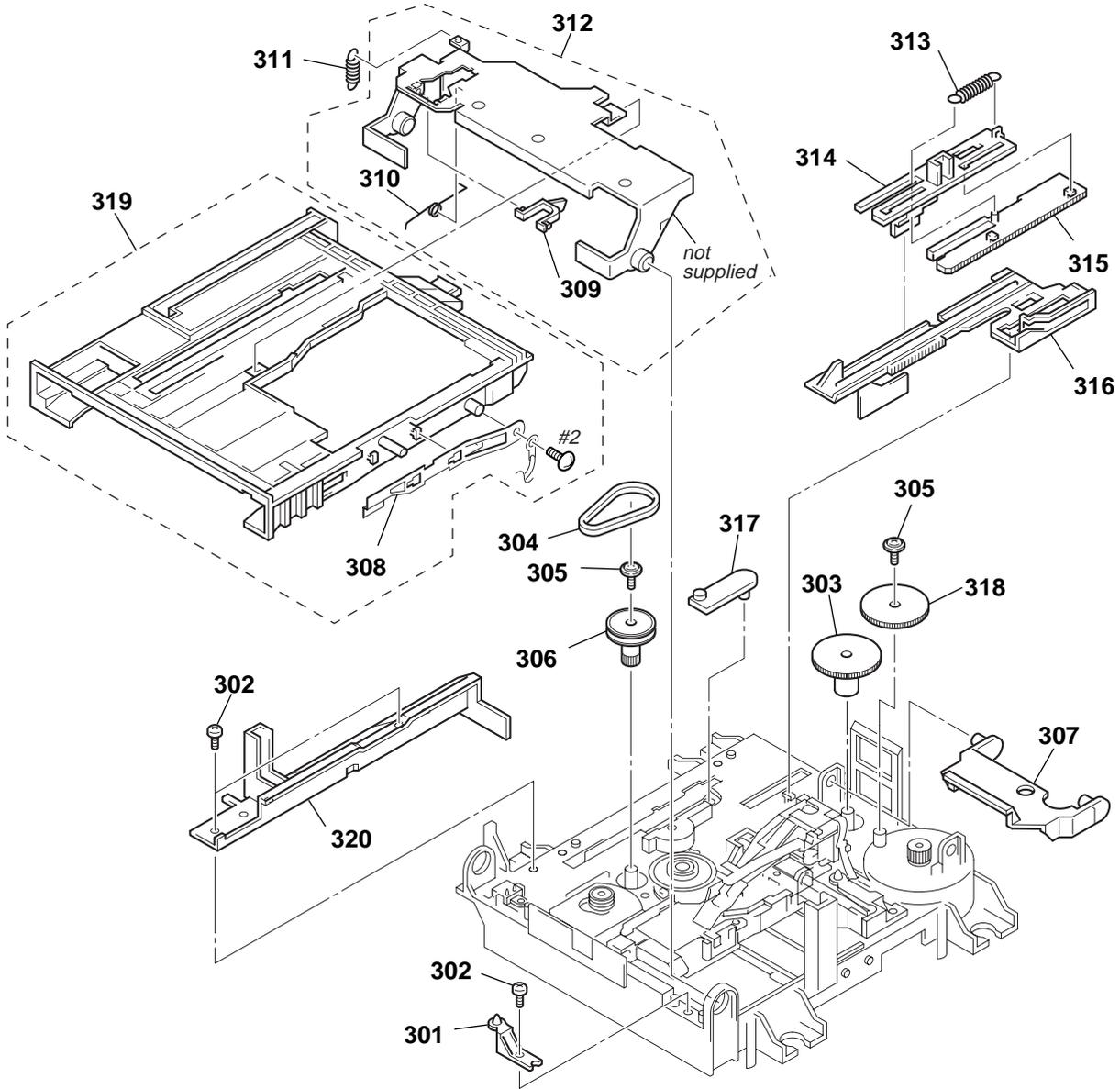
Ref. No.	Part No.	Description	Remarks
* 301	4-996-267-01	BASE (BU-D)	
302	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI	
303	4-227-007-01	GEAR (SB)	
304	4-227-025-01	BELT (LOADING)	
305	3-372-761-01	SCREW (M1.7), TAPPING	
306	4-227-002-01	GEAR, PULLEY	
307	4-226-999-01	LEVER (HEAD)	
308	X-4952-665-1	SPRING (SHT) ASSY, LEAF	
309	4-228-923-01	LOCK (HOLDER)	
310	4-229-533-02	SPRING (STOPPER), TORSION	
311	4-231-118-01	SPRING (HOLDER), TENSION	

Ref. No.	Part No.	Description	Remarks
312	A-4680-638-B	PLATE (HOLDER) ASSY, RETAINER	
313	4-227-013-01	SPRING (EJ), TENSION	
314	4-226-996-01	LIMITTER (EJ)	
315	4-226-995-01	SLIDER (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-B	HOLDER ASSY	
320	4-226-994-01	GUIDE (L)	
#2	7-685-850-04	SCREW +BVTT 2X3 (S)	

7-4. MECHANISM SECTION-2
   (MDM-7S1A)
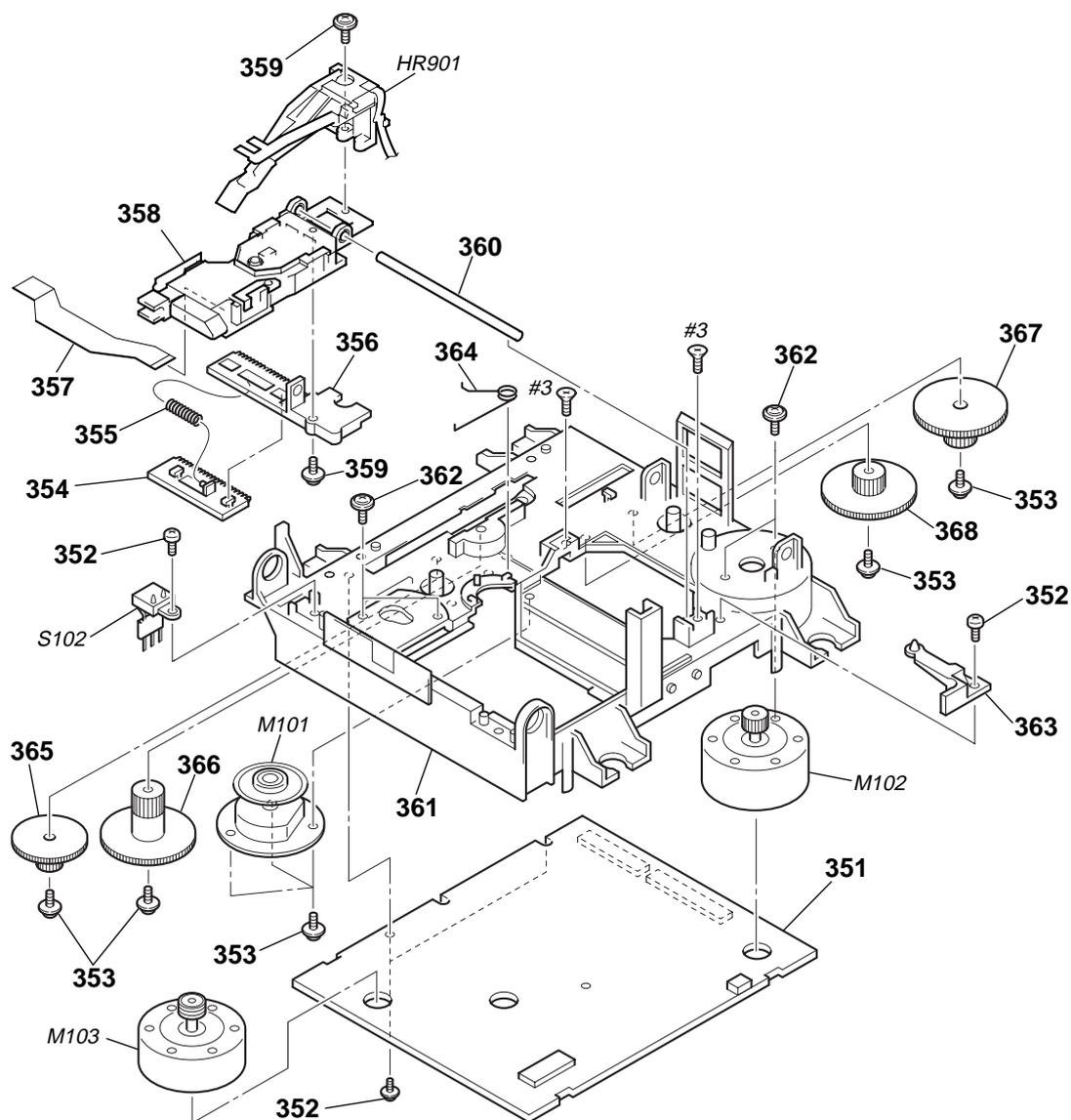
The components identified by mark ⚠ or dotted line
with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
351	A-4727-976-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	PWB, FLEXIBLE	
⚠ 358	A-4672-541-A	OPTICAL PICK-UP KMS-260E	
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	4-226-990-04	BASE (BU-A)	

Ref. No.	Part No.	Description	Remarks
364	4-230-716-01	SPRING (SPDL), 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	1-500-670-22	HEAD, OVER LIGHT	
M101	A-4735-757-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/PROTECT SW)	
#3	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT	

SECTION 8
ELECTRICAL PARTS LIST

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

- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...
- Abbreviation
  RU : Russian model

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

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

Ref. No.	Part No.	Description			Remarks
	A-4727-976-A	BD BOARD, COMPLETE			
		*****************			
		< CAPACITOR >			
C101	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C105	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C106	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C107	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C108	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C109	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C110	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C111	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C113	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C114	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C115	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C116	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C117	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C119	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C120	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C122	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C175	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C194	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C205	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C206	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C209	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C211	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C212	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C214	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C215	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C216	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C219	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C220	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C221	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C230	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C231	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C233	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C234	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C235	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C240	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C241	1-164-156-11	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remarks
C242	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C250	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C251	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C252	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C253	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C254	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C255	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C299	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C301	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C302	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C405	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C407	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C409	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C410	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C411	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C412	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C490	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C501	1-131-872-91	CERAMIC CHIP	1000PF	10%	630V
C502	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C503	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C504	1-117-370-11	CERAMIC CHIP	10uF		10V
C505	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C550	1-117-970-11	ELECT CHIP	22uF	20%	10V
C701	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C702	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C703	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C704	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C803	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C809	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C899	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C901	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C902	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C903	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C904	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C905	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C907	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C908	1-117-370-11	CERAMIC CHIP	10uF		10V
C909	1-104-852-11	TANTAL. CHIP	22uF	20%	10V
C998	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C999	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C1102	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			

Ref. No.	Part No.	Description			Remarks
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			
D501	8-719-080-81	DIODE FS1J6			
D502	8-719-080-81	DIODE FS1J6			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			
IC153	8-759-671-27	IC MSM51V4400E-70TS-K			
IC181	8-759-481-17	IC MC74ACT08DTR2			
IC195	8-759-641-86	IC BR24C16F-E2			
IC201	8-752-414-89	IC CXD2664R			
IC401	8-759-836-79	IC BH6519FS-E2			
IC701	8-759-473-51	IC TLV2361CDBV			
IC803	6-701-793-01	IC CY24115-2SCT			
IC926	8-759-835-63	IC NJM2391DL1-26(TE1)			
IC933	8-759-460-72	IC BA033FP-E2			
		< COIL >			
L8	1-414-760-21	FERRITE	0uH		
L10	1-469-981-21	FERRITE	0uH		
L122	1-414-760-21	FERRITE	0uH		
L201	1-414-760-21	FERRITE	0uH		
L202	1-469-981-21	FERRITE	0uH		
L203	1-414-760-21	FERRITE	0uH		
L401	1-400-050-11	FERRITE	0uH		
L402	1-400-050-11	FERRITE	0uH		
L501	1-400-050-11	FERRITE	0uH		
L502	1-400-050-11	FERRITE	0uH		
L550	1-414-760-21	FERRITE	0uH		
L601	1-469-981-21	FERRITE	0uH		
L602	1-469-981-21	FERRITE	0uH		
L603	1-414-760-21	FERRITE	0uH		
L701	1-414-760-21	FERRITE	0uH		
L801	1-414-760-21	FERRITE	0uH		
* L899	1-500-282-11	FERRITE	0uH		
		< TRANSISTOR >			
Q181	8-729-018-75	TRANSISTOR 2SJ278MY			
Q182	8-729-017-65	TRANSISTOR 2SK1764KY			
Q201	8-729-403-35	TRANSISTOR UN5113			
Q202	8-729-101-07	TRANSISTOR 2SB798-DL			
Q203	8-729-403-35	TRANSISTOR UN5113			
Q701	8-729-402-93	TRANSISTOR UN5214			
Q702	8-729-903-10	TRANSISTOR FMW1			
Q703	8-729-402-93	TRANSISTOR UN5214			
Q704	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR			
		< RESISTOR >			
R101	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R102	1-219-724-11	METAL CHIP	1	1%	1/4W
R103	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R104	1-216-853-11	METAL CHIP	470K	5%	1/16W
R105	1-216-863-11	RES-CHIP	3.3M	5%	1/10W
R106	1-216-845-11	METAL CHIP	100K	5%	1/16W
R107	1-216-819-11	METAL CHIP	680	5%	1/16W
R108	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R110	1-216-853-11	METAL CHIP	470K	5%	1/16W
R111	1-216-833-11	METAL CHIP	10K	5%	1/16W
R112	1-216-845-11	METAL CHIP	100K	5%	1/16W
R113	1-216-833-11	METAL CHIP	10K	5%	1/16W
R114	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W
R116	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R117	1-216-845-11	METAL CHIP	100K	5%	1/16W
R118	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R119	1-216-837-11	METAL CHIP	22K	5%	1/16W
R120	1-216-839-11	METAL CHIP	33K	5%	1/16W
R121	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R122	1-216-833-11	METAL CHIP	10K	5%	1/16W
R201	1-216-815-11	METAL CHIP	330	5%	1/16W
R202	1-216-819-11	METAL CHIP	680	5%	1/16W
R203	1-216-809-11	METAL CHIP	100	5%	1/16W
R205	1-216-833-11	METAL CHIP	10K	5%	1/16W
R206	1-216-833-11	METAL CHIP	10K	5%	1/16W
R207	1-216-811-11	METAL CHIP	150	5%	1/16W
R208	1-216-821-11	METAL CHIP	1K	5%	1/16W
R209	1-216-815-11	METAL CHIP	330	5%	1/16W
R210	1-216-839-11	METAL CHIP	33K	5%	1/16W
R211	1-216-857-11	METAL CHIP	1M	5%	1/16W
R212	1-216-851-11	METAL CHIP	330K	5%	1/16W
R214	1-216-845-11	METAL CHIP	100K	5%	1/16W
R216	1-216-864-11	METAL CHIP	0	5%	1/16W
R217	1-216-833-11	METAL CHIP	10K	5%	1/16W
R218	1-216-864-11	METAL CHIP	0	5%	1/16W
R219	1-216-809-11	METAL CHIP	100	5%	1/16W
R224	1-216-809-11	METAL CHIP	100	5%	1/16W
R225	1-216-809-11	METAL CHIP	100	5%	1/16W
R226	1-216-809-11	METAL CHIP	100	5%	1/16W
R228	1-216-809-11	METAL CHIP	100	5%	1/16W
R281	1-216-821-11	METAL CHIP	1K	5%	1/16W
R298	1-216-809-11	METAL CHIP	100	5%	1/16W
R299	1-216-864-11	METAL CHIP	0	5%	1/16W
R301	1-216-833-11	METAL CHIP	10K	5%	1/16W
R302	1-216-833-11	METAL CHIP	10K	5%	1/16W
R303	1-216-833-11	METAL CHIP	10K	5%	1/16W
R405	1-216-864-11	METAL CHIP	0	5%	1/16W
R501	1-220-942-11	METAL CHIP	3.3	1%	1/4
R502	1-220-942-11	METAL CHIP	3.3	1%	1/4
R551	1-216-841-11	METAL CHIP	47K	5%	1/16W
R552	1-216-841-11	METAL CHIP	47K	5%	1/16W
R553	1-216-841-11	METAL CHIP	47K	5%	1/16W
R701	1-216-821-11	METAL CHIP	1K	5%	1/16W
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W
R703	1-216-821-11	METAL CHIP	1K	5%	1/16W
R704	1-216-841-11	METAL CHIP	47K	5%	1/16W
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W
R706	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R707	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R708	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R709	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R710	1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R711	1-216-833-11	METAL CHIP	10K	5%	1/16W
R712	1-216-809-11	METAL CHIP	100	5%	1/16W
R713	1-216-833-11	METAL CHIP	10K	5%	1/16W
R802	1-216-864-11	METAL CHIP	0	5%	1/16W
R803	1-216-864-11	METAL CHIP	0	5%	1/16W
R805	1-216-809-11	METAL CHIP	100	5%	1/16W

MDS-JE480

BD	DISPLAY	KEY SW	MAIN

Ref. No.	Part No.	Description			Remarks
R814	1-216-864-11	METAL CHIP	0	5%	1/16W
R815	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) (OUT)			
S104	1-771-955-21	SWITCH, PUSH (1 KEY) (PLAY)			
S105	1-771-955-21	SWITCH, PUSH (1 KEY) (REC)			

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	A-4727-955-A	DISPLAY BOARD, COMPLETE			
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	4-212-590-22	HOLDER (FL)			
	4-949-935-41	CUSHION (FL)			
		< CAPACITOR >			
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C760	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C761	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C762	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C763	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C764	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C765	1-126-153-11	ELECT	22uF	20%	6.3V
C766	1-131-992-91	CERAMIC CHIP	100000PF		35V
C767	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C769	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C781	1-124-584-00	ELECT	100uF	20%	10V
C782	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN701	1-779-552-21	CONNECTOR,FFC(LIF(NON-ZIF))15P			
CN710	1-785-712-11	CONNECTOR, BOARD TO BOARD 4P			
		< DIODE >			
D775	8-719-046-39	DIODE SEL5821A-TP15 (MD LP)			
		< FLUORESCENT INDICATOR TUBE >			
FL750	1-517-986-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC760	6-702-067-01	IC PT6302-R-002			
IC781	8-759-826-33	IC NJL73H400A			
		< TRANSISTOR >			
Q767	8-729-029-94	TRANSISTOR DTC143TSA			
Q775	8-729-900-80	TRANSISTOR DTC114ES			
		< RESISTOR >			
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W
R703	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R704	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R705	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R706	1-216-833-11	METAL CHIP	10K	5%	1/16W
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W
R713	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R714	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R715	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R716	1-216-833-11	METAL CHIP	10K	5%	1/16W
R760	1-216-809-11	METAL CHIP	100	5%	1/16W
R761	1-216-809-11	METAL CHIP	100	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R762	1-216-809-11	METAL CHIP	100	5%	1/16W
R763	1-216-809-11	METAL CHIP	100	5%	1/16W
R767	1-216-845-11	METAL CHIP	100K	5%	1/16W
R769	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R775	1-216-813-11	METAL CHIP	220	5%	1/16W
R781	1-216-805-11	METAL CHIP	47	5%	1/16W
R782	1-216-809-11	METAL CHIP	100	5%	1/16W
		< SWITCH >			
S701	1-762-875-21	SWITCH, KEYBOARD (REC ●)			
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)			
S706	1-762-875-21	SWITCH, KEYBOARD (▷)			
S711	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)			
S712	1-762-875-21	SWITCH, KEYBOARD (YES)			
S713	1-475-235-21	ENCODER, ROTARY (I◀◀IAMSI▷▶I)			
S714	1-762-875-21	SWITCH, KEYBOARD (CLEAR)			
S715	1-762-875-21	SWITCH, KEYBOARD (INPUT)			
S716	1-762-875-21	SWITCH, KEYBOARD (REC MODE)			
S721	1-762-875-21	SWITCH, KEYBOARD (EJECT ⏏)			

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	1-683-587-11	KEY-SW BOARD			
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		< CAPACITOR >			
C740	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
		< CONNECTOR >			
CN720	1-785-713-11	CONNECTOR, BOARD TO BOARD 4P			
		< DIODE >			
D726	8-719-046-44	DIODE SEL5221S (STNDBY)			
		< TRANSISTOR >			
Q726	8-729-900-80	TRANSISTOR DTC114ES			
		< RESISTOR >			
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W
R723	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R724	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R725	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R726	1-216-864-11	METAL CHIP	0	5%	1/16W
R1726	1-216-813-11	METAL CHIP	220	5%	1/16W
		< SWITCH >			
S722	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE)			
S723	1-762-875-21	SWITCH, KEYBOARD (REPEAT)			
S724	1-762-875-21	SWITCH, KEYBOARD (LEVEL/DISPLAY/CHAR)			
S726	1-762-875-21	SWITCH, KEYBOARD (I/⏻)			

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	A-4727-954-A	MAIN BOARD, COMPLETE			
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	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT(B)			
		< LITHIUM BATTERY >			
BT406	1-756-121-11	BATTERY, LITHIUM SECONDARY			

Ref. No.	Part No.	Description			Remarks
		< CAPACITOR >			
C12	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C16	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C19	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C58	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C62	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C87	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C88	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C89	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C100	1-126-964-11	ELECT	10uF	20%	50V
C111	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C112	1-126-965-91	ELECT	22uF	20%	50V
C113	1-126-965-91	ELECT	22uF	20%	50V
C160	1-126-965-91	ELECT	22uF	20%	50V
C166	1-137-503-11	MYLAR	0.0001uF	5%	50V
C176	1-126-965-91	ELECT	22uF	20%	50V
C177	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C211	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C212	1-126-965-91	ELECT	22uF	20%	50V
C213	1-126-965-91	ELECT	22uF	20%	50V
C266	1-137-503-11	MYLAR	0.0001uF	5%	50V
C270	1-126-965-91	ELECT	22uF	20%	50V
C276	1-126-965-91	ELECT	22uF	20%	50V
C277	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C312	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C317	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C362	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C367	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C401	1-126-939-11	ELECT	10000uF	20%	16V
C402	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C404	1-126-933-11	ELECT	100uF	20%	16V
C405	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C406	1-124-252-00	ELECT	0.33uF	20%	50V
C411	1-126-939-11	ELECT	10000uF	20%	16V
C412	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C413	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C416	1-126-916-11	ELECT	1000uF	20%	6.3V
C423	1-128-576-11	ELECT	100uF	20%	63V
C424	1-126-964-11	ELECT	10uF	20%	50V
C425	1-126-968-11	ELECT	100uF	20%	50V
C426	1-126-965-91	ELECT	22uF	20%	50V
C431	1-104-663-11	ELECT	33uF	20%	25V
C432	1-126-965-91	ELECT	22uF	20%	50V
C441	1-126-933-11	ELECT	100uF	20%	16V
C442	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C443	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C461	1-126-935-11	ELECT	470uF	20%	16V
C466	1-126-935-11	ELECT	470uF	20%	16V
C491	1-126-935-11	ELECT	470uF	20%	16V
C492	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C493	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C500	1-126-934-11	ELECT	220uF	20%	10V
C501	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C502	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C503	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C504	1-126-933-11	ELECT	100uF	20%	16V
C505	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C509	1-216-864-11	METAL CHIP	0	5%	1/16W
C519	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C523	1-126-933-11	ELECT	100uF	20%	16V
C524	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V

Ref. No.	Part No.	Description			Remarks
C530	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C550	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C551	1-126-933-11	ELECT	100uF	20%	16V
C552	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C553	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C554	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C601	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C611	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C612	1-126-963-11	ELECT	4.7uF	20%	50V
C613	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C652	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C658	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C680	1-216-864-11	METAL CHIP	0	5%	1/16W
		< CONNECTOR >			
CN1	1-784-417-11	CONNECTOR, FFC(LIF(NON-ZIF)23P			
CN2	1-779-295-11	CONNECTOR, FFC(LIF(NON-ZIF))27P			
* CN3	1-794-175-11	CONNECTOR, FFC(LIF(NON-ZIF))15P			
CN400	1-691-772-11	PLUG (MICRO CONNECTOR) 10P			
CN406	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P			
		< DIODE >			
D111	8-719-988-61	DIODE 1SS355TE-17			
D112	8-719-988-61	DIODE 1SS355TE-17			
D211	8-719-988-61	DIODE 1SS355TE-17			
D212	8-719-988-61	DIODE 1SS355TE-17			
D381	8-719-988-61	DIODE 1SS355TE-17			
D382	8-719-988-61	DIODE 1SS355TE-17			
D401	8-719-085-36	DIODE 11EQS04-TB5			
D402	8-719-085-36	DIODE 11EQS04-TB5			
D403	8-719-085-36	DIODE 11EQS04-TB5			
D404	8-719-085-36	DIODE 11EQS04-TB5			
D406	8-719-988-61	DIODE 1SS355TE-17			
D408	8-719-085-36	DIODE 11EQS04-TB5			
D409	8-719-085-36	DIODE 11EQS04-TB5			
D411	8-719-200-82	DIODE 11ES2			
D412	8-719-200-82	DIODE 11ES2			
D421	8-719-200-82	DIODE 11ES2			
D422	8-719-976-96	DIODE DTZ4.7C			
D423	8-719-977-81	DIODE DTZ33B			
D431	8-719-988-61	DIODE 1SS355TE-17			
D432	8-719-988-61	DIODE 1SS355TE-17			
D433	8-719-988-61	DIODE 1SS355TE-17			
D461	8-719-200-82	DIODE 11ES2			
D462	8-719-200-82	DIODE 11ES2			
D466	8-719-200-82	DIODE 11ES2			
D467	8-719-200-82	DIODE 11ES2			
		< FERRITE BEAD >			
FB166	1-216-864-11	METAL CHIP	0	5%	1/16W
FB410	1-216-864-11	METAL CHIP	0	5%	1/16W
FB460	1-414-813-11	FERRITE	0UH		
FB465	1-414-813-11	FERRITE	0UH		
		< IC >			
IC1	6-801-321-01	IC M30622MGN-373FP			
IC310	8-759-710-97	IC NJM4565M(TE2)			
IC360	8-759-710-97	IC NJM4565M(TE2)			
IC401	8-759-647-10	IC uPC2933HF			
IC406	8-759-481-02	IC M62016L			
IC411	8-759-231-53	IC M5F7805L			
IC440	8-759-822-09	IC LB1641			

Ref. No.	Part No.	Description			Remarks
IC490	8-759-647-10	IC uPC2933HF			
IC500	6-700-563-01	IC AK4552VT-E2			
IC550	8-759-242-70	IC TC7WU04F(TE12R)			
IC600	8-759-269-92	IC SN74HCU04ANSR			
IC611	8-749-019-26	IC TORX141 (DIGITAL OPTICAL IN)			
		< JACK >			
J300	1-784-429-11	JACK, PIN 4P (ANALOG IN/OUT)			
		< COIL >			
L349	1-216-864-11	METAL CHIP	0	5%	1/16W
L450	1-216-864-11	METAL CHIP	0	5%	1/16W
L451	1-216-864-11	METAL CHIP	0	5%	1/16W
L506	1-216-864-11	METAL CHIP	0	5%	1/16W
L523	1-216-864-11	METAL CHIP	0	5%	1/16W
L524	1-216-864-11	METAL CHIP	0	5%	1/16W
L551	1-216-864-11	METAL CHIP	0	5%	1/16W
L552	1-216-864-11	METAL CHIP	0	5%	1/16W
L651	1-216-864-11	METAL CHIP	0	5%	1/16W
L653	1-216-864-11	METAL CHIP	0	5%	1/16W
L657	1-216-864-11	METAL CHIP	0	5%	1/16W
L658	1-216-864-11	METAL CHIP	0	5%	1/16W
L660	1-216-864-11	METAL CHIP	0	5%	1/16W
L662	1-216-864-11	METAL CHIP	0	5%	1/16W
L666	1-216-864-11	METAL CHIP	0	5%	1/16W
L668	1-216-864-11	METAL CHIP	0	5%	1/16W
		< TRANSISTOR >			
Q181	8-729-823-22	TRANSISTOR 2SC3576			
Q281	8-729-823-22	TRANSISTOR 2SC3576			
Q380	8-729-422-57	TRANSISTOR UN4111			
Q421	8-729-209-60	TRANSISTOR 2SB1375			
Q440	8-729-900-80	TRANSISTOR DTC114ES			
Q445	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q911	8-729-922-37	TRANSISTOR 2SD2144S-UVW			
		< RESISTOR >			
R4	1-216-864-11	METAL CHIP	0	5%	1/16W
R9	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R17	1-216-864-11	METAL CHIP	0	5%	1/16W
R31	1-216-864-11	METAL CHIP	0	5%	1/16W
R33	1-216-864-11	METAL CHIP	0	5%	1/16W
R41	1-216-845-11	METAL CHIP	100K	5%	1/16W
R44	1-216-833-11	METAL CHIP	10K	5%	1/16W
R46	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
R53	1-216-833-11	METAL CHIP	10K	5%	1/16W
R55	1-216-833-11	METAL CHIP	10K	5%	1/16W
R61	1-216-833-11	METAL CHIP	10K	5%	1/16W
R62	1-216-809-11	METAL CHIP	100	5%	1/16W
R87	1-216-833-11	METAL CHIP	10K	5%	1/16W
R88	1-216-833-11	METAL CHIP	10K	5%	1/16W
R90	1-216-845-11	METAL CHIP	100K	5%	1/16W
R93	1-216-833-11	METAL CHIP	10K	5%	1/16W
R94	1-216-833-11	METAL CHIP	10K	5%	1/16W
R95	1-216-833-11	METAL CHIP	10K	5%	1/16W
R97	1-216-833-11	METAL CHIP	10K	5%	1/16W
R100	1-216-845-11	METAL CHIP	100K	5%	1/16W
R111	1-216-839-11	METAL CHIP	33K	5%	1/16W
R112	1-216-833-11	METAL CHIP	10K	5%	1/16W
R113	1-216-849-11	METAL CHIP	220K	5%	1/16W
R115	1-216-805-11	METAL CHIP	47	5%	1/16W
R163	1-216-845-11	METAL CHIP	100K	5%	1/16W
R164	1-216-809-11	METAL CHIP	100	5%	1/16W
R165	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R166	1-216-833-11	METAL CHIP	10K	5%	1/16W
R171	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	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R211	1-216-839-11	METAL CHIP	33K	5%	1/16W
R212	1-216-833-11	METAL CHIP	10K	5%	1/16W
R213	1-216-849-11	METAL CHIP	220K	5%	1/16W
R215	1-216-805-11	METAL CHIP	47	5%	1/16W
R263	1-216-845-11	METAL CHIP	100K	5%	1/16W
R264	1-216-809-11	METAL CHIP	100	5%	1/16W
R265	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R266	1-216-833-11	METAL CHIP	10K	5%	1/16W
R271	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
R281	1-216-829-11	METAL CHIP	4.7K	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
R406	1-216-813-11	METAL CHIP	220	5%	1/16W
R407	1-216-833-11	METAL CHIP	10K	5%	1/16W
R420	1-216-864-11	METAL CHIP	0	5%	1/16W
R421	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R423	1-216-845-11	METAL CHIP	100K	5%	1/16W
R424	1-216-813-11	METAL CHIP	220	5%	1/16W
R425	1-216-813-11	METAL CHIP	220	5%	1/16W
R430	1-216-833-11	METAL CHIP	10K	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	1-216-815-11	METAL CHIP	330	5%	1/16W
R434	1-216-837-11	METAL CHIP	22K	5%	1/16W
R435	1-216-833-11	METAL CHIP	10K	5%	1/16W
R436	1-216-841-11	METAL CHIP	47K	5%	1/16W
R437	1-216-821-11	METAL CHIP	1K	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
R511	1-216-864-11	METAL CHIP	0	5%	1/16W
R512	1-216-864-11	METAL CHIP	0	5%	1/16W
R513	1-216-864-11	METAL CHIP	0	5%	1/16W
R514	1-216-864-11	METAL CHIP	0	5%	1/16W
R551	1-216-857-11	METAL CHIP	1M	5%	1/16W
R552	1-216-815-11	METAL CHIP	330	5%	1/16W
R554	1-216-817-11	METAL CHIP	470	5%	1/16W
R556	1-216-817-11	METAL CHIP	470	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
R911	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R912	1-216-841-11	METAL CHIP	47K	5%	1/16W
R943	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1091	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description		Remarks
		< VIBRATOR >		
X15	1-795-004-21	VIBRATOR, CERAMIC (10MHz)		
X550	1-767-406-21	VIBRATOR, CRYSTAL (11.2896MHz)		
		**		
	1-683-584-11	PT BOARD		
		********		
		< CAPACITOR >		
⚠ C910	1-113-920-11	CERAMIC	0.0022uF 20% 250V	
C923	1-131-992-91	CERAMIC CHIP	100000PF 35V	
C924	1-131-992-91	CERAMIC CHIP	100000PF 35V	
C951	1-131-992-91	CERAMIC CHIP	100000PF 35V	
C952	1-131-992-91	CERAMIC CHIP	100000PF 35V	
		< CONNECTOR >		
* CN900	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P		
		< DIODE >		
D910	8-719-988-61	DIODE 1SS355TE-17		
		< LINE FILTER >		
⚠ LF900	1-419-625-11	COIL, LINE FILTER		
		< RELAY >		
⚠ RY910	1-755-356-11	RELAY		
		< TRANSFORMER >		
⚠ TR950	1-437-335-11	TRANSFORMER, POWER (US)		
⚠ TR950	1-437-336-11	TRANSFORMER, POWER (AEP, UK, RU)		
		**		
		MISCELLANEOUS		
		*************		
⚠	1-770-019-51	ADAPTOR, CONVERSION PLUG (UK)		
9	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)		
⚠ 12	1-777-071-63	CORD, POWER (AEP, UK, RU)		
⚠ 12	1-783-532-32	CORD, POWER (US)		
* 14	1-569-972-21	SOCKET, SHORT 2P		
55	1-757-929-11	WIRE (FLAT TYPE) (15 CORE)		
357	1-678-514-11	PWB, FLEXIBLE		
⚠ 358	A-4672-541-A	OPTICAL PICK-UP KMS-260E		
HR901	1-500-670-22	HEAD, OVER LIGHT		
M101	A-4735-757-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/PROTECT SW)		
⚠ TR900	1-435-543-11	TRANSFORMER, POWER (US)		
⚠ TR900	1-435-544-11	TRANSFORMER, POWER (AEP, UK, RU)		
		**		

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES	
		***********	
	1-476-723-11	REMOTE COMMANDER (RM-D10E)	
	1-776-263-12	CORD, CONNECTION (AUDIO)	
	1-574-264-11	CORD, LIGHT PLUG (OPTICAL)	
	4-238-553-12	INSTRUCTION MANUAL (ENGLISH) (EXCEPT RU)	
	4-238-553-21	INSTRUCTION MANUAL (FRENCH,DUTCH,SWEDISH,GERMAN,SPANISH, ITALIAN,POLISH)(AEP)	
	4-238-553-31	INSTRUCTION MANUAL (DANISH,FINNISH) (AEP)	
	4-238-553-41	INSTRUCTION MANUAL (PORTUGUESE)(AEP)	
	4-238-553-51	INSTRUCTION MANUAL (RUSSIAN)(AEP)	
	4-238-553-61	INSTRUCTION MANUAL (RUSSIAN)(RU)	
	4-981-643-11	COVER, BATTERY (For RM-D10E)	

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

REVISION HISTORY

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Ver.	Date	Description of Revision
1.0	2002.04	New
1.1	2003.04	US model addition. (ENG-03002)
1.2	2005.03	Correction of exploded views (part No. and Description of Ref. No. 314 and 315 replacement). (SPM-05011)
1.3	2005.11	Russian model addition.
1.4	2006.02	Hair-line finished silver model (AEP, UK, RU) addition. (SPM-06013)
1.5	2006.12	Correction of part No. of Ref. No. 309. Correction of description of Ref. No. 312. (SPM-06075) Exchange of part No. and description of Ref. No. 367 and 368. (SPM-06074)