

MDS-LSA1

SERVICE MANUAL

AEP Model
UK Model



US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MDM-7X2B
Optical Pick-up Type	KMS-262A/J1N

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Less than $44.6 \mu\text{W}^*$ * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
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)/ATRAC3
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz $\pm 0.3 \text{ dB}$
Signal-to-noise ratio	Over 100 dB during playback
Wow and flutter	Below measurable limit

Inputs/outputs

i.LINK S200 Jack type: 4-pins to 4-pins

General

Power requirements	230 V AC, 50/60 Hz
Power consumption	18 W
Dimensions (approx.)	430 x 70 x 315 mm (w/h/d) incl. projecting parts and controls
Mass (approx.)	4.4 kg

Supplied accessories

- i.LINK connecting cable (1)
- Remote commander (remote) (1)

Design and specifications are subject to change without notice.

MINIDISC DECK

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 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.

Code/Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. ➔ Take out the MD and close the record-protect slot (page 13).
C12/Cannot Copy	An attempt was made to play a disc that is not compatible with this deck (MD data disc, etc.). ➔ Replace the disc.
C13/REC Error	The recording was not made properly. ➔ 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	The deck could not read the TOC on the MD properly. ➔ Take out the MD and insert it again.
C14/TOC Error	The deck could not read the TOC on the MD properly. ➔ Insert another disc. ➔ If possible, erase all the tracks on the MD (page 29).
C41/Cannot Copy	The digitally dubbed material cannot be recorded digitally (page 14).
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 i.LINK S200 connector, the digital connecting cable was unplugged or the digital component turned off. ➔ Connect the cable or turn the digital component back on.
C78:03/LOOP CONNECT	The i.LINK connection is looped. ➔ Check the connection (see page 39).
C78:04/NO SIGNAL	The selected component is turned on, but no signal is not output from the component. ➔ Check the selected component.
C78:11/C78:12/CANNOT LINC	The deck cannot establish a LINC with a component because of an existing LINC between the deck and another component. ➔ Cancel the LINC between the deck and the other component.
C78:15/BUS FULL	The signal bus within the i.LINK configuration is full and no more signals can be output from the deck.
C78:21/NO SIGNAL	The deck and the selected component are connected correctly, but no signal from the component is input to the deck. ➔ Check the selected component.
C78:22/NO SIGNAL	The format of the input signal is not supported.
C78:23/NO SIGNAL	The selected component is not turned on. ➔ Verify that the component is on.
C78:31/NO SIGNAL	The communication between the deck and the selected component is unstable. Or, the format of the input signal is not supported. ➔ Check the condition and the signal format of the selected component.
C78:32/NEW CONNECT	While recording, a new component is connected within the i.LINK configuration, or a mains lead or an i.LINK connecting cable of the component within the configuration is connected or disconnected. ➔ Do not connect or disconnect any mains leads or i.LINK connecting cables during recording. If you do, recording may not be done correctly.
E0001/MEMORY NG	There is an error in the internal data that the deck needs in order to operate. ➔ Consult you nearest Sony dealer.
E0101/LASER NG	There is a problem with the optical pick-up. ➔ Consult you 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 **POWER “X2”** button to exit the mode.

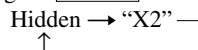
1. While pressing the **Left Arrow** button and **Stop** button, connect the power plug to the outlet, and release the **Left Arrow** button and **Stop** button. When the test mode is set, “[Check]” will be displayed.
2. Press the **Left Arrow** or **Right Arrow** button and when “[Service]” is displayed, press the **Play/Pause** button.
3. Press the **Left Arrow** or **Right Arrow** button and display “Err Display”.
4. Pressing the **Play/Pause** button sets the error history mode and displays “op rec tm”.
5. Select the contents to be displayed or executed using the **Left Arrow** button.
6. Pressing the **POWER** button will display or execute the contents selected.
7. Pressing the **POWER** button another time returns to step 4.
8. Pressing the **Stop** button displays “Err Display” and exits the error history mode.
9. To exit the test mode, press the **POWER “X2”** button. The unit sets into the STANDBY state, the disc is ejected, and the test mode ends.
10. If the unit fails to enter STANDBY mode, remove the AC cord from its socket, insert the AC cord into the socket again, turn on the power, and then check to make sure that the unit has exited from test mode.

NOTE

- The MDS-LSA1 is designed so that a number of functions which may be performed in test mode may be performed by clicking a single button.

Switching between functions

Pressing the **INPUT** button causes the display to change as indicated below.



The functions performed by each button change in accordance with the DISPLAY mode.

Note that the following notation is used herein:

POWER..... Press the **POWER** button when HIDDEN.

POWER “X2”... Press the **POWER** button while “X2” is lit.

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  button.
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  button.
er refresh	Mode for erasing the error and retry address histories Procedure 1. Press the  button when displayed as "er refresh". 2. Press the  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.
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 pick-up. If the optical pick-up has been replaced, perform this procedure and erase the history. Procedure 1. Press the  button when displayed as "op change". 2. Press the  button when the display changes to "op change?". When "Complete!" is displayed, it means erasure has completed.
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  button when displayed as "spdl change" 2. Press the  button when the display changes to "spdl change?" 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.

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SECTION 1

SERVICE NOTES

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

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

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

NOTES ON LASER DIODE EMISSION CHECK

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

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 UDSÆTTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT, NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE, ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD, BETRakta EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES, UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYAZAT! : A BURKOLAT NYITÁSÁKOR 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.

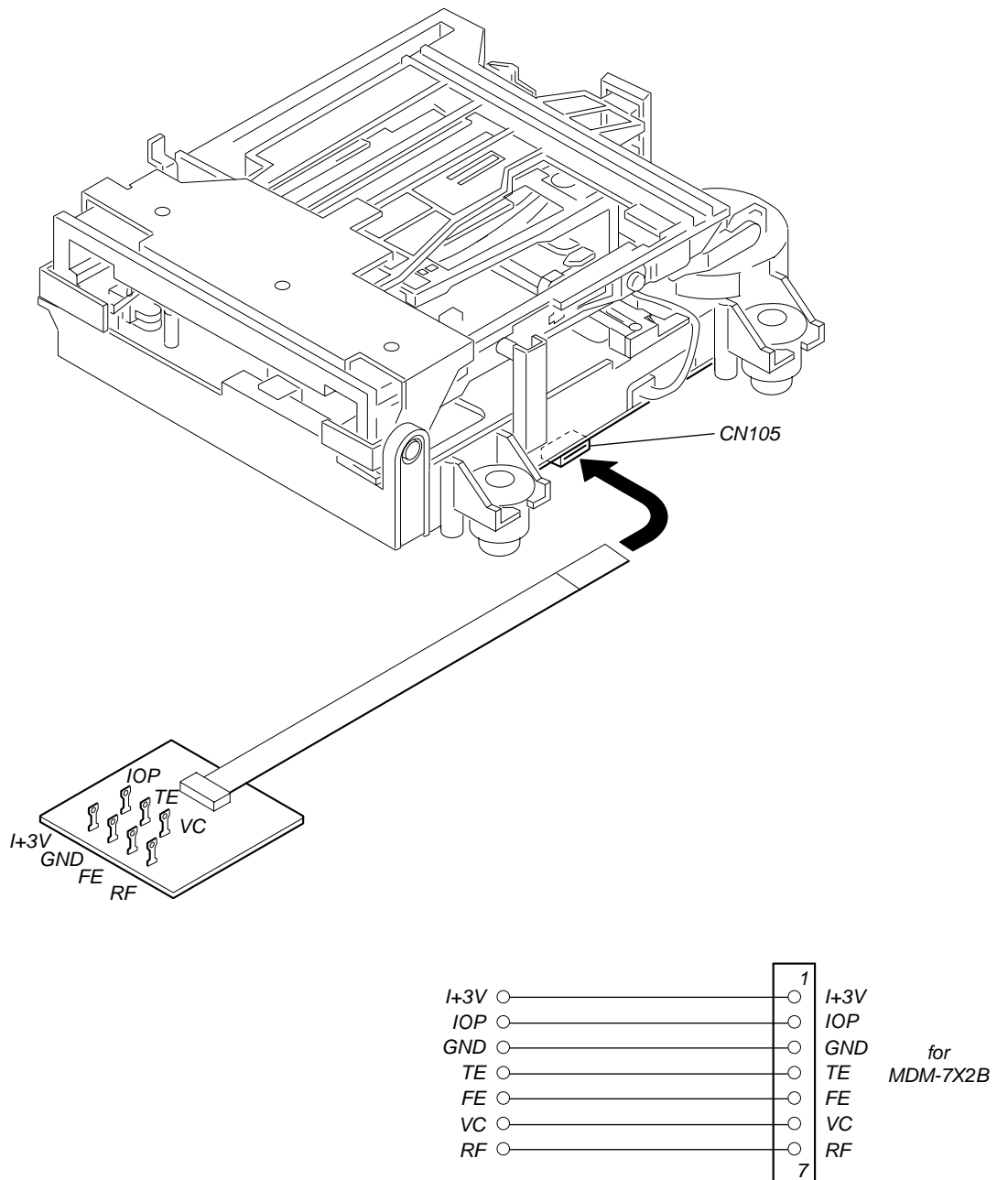
SAFETY-RELATED COMPONENT WARNING!!

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

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  button and  button, connect the power plug to the outlet, and release the  button and  button.
2. Press the  or  button to display “[Service]”, and press the  button.
3. Press the  or  button to display “Iop Write”, and press the  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 : Press the  or  button.
To select the digit : Press the  button.
6. When the  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  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  button to complete.

Display Procedure:

1. While pressing the  button and  button, connect the power plug to the outlet, and release the  button and  button.
2. Press the  or  button to display “[Service]”, and press the  button.
3. Press the  or  button to display “Iop Read”, and press the  button.
4. “@@.@/###.#” is displayed and the recorded contents are displayed.
@@.@ : indicates the Iop value labeled on the optical pick-up.
###.# : indicates the Iop value after adjustment.
5. To end, press the  button to display “Iop Read”. Then press the  button.

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 33)
- 5-6-3. Iop Compare (see page 33)
- 5-6-4. Auto Check (see page 34)

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

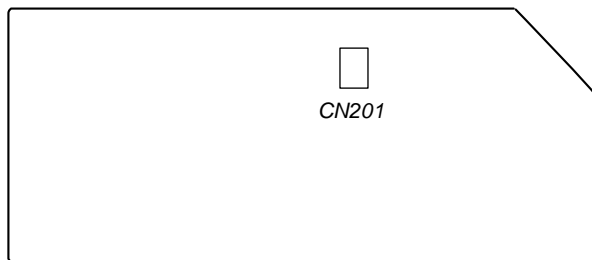
The system microprocessor can be reset in the following procedure.

Use these procedure when the unit cannot be operated normally due to the overrunning of the microprocessor, etc.

Procedure :

1. Disconnect the short-circuit pin of CN201.
2. Disconnect the AC outlet.
3. After some time, connect AC power plug to the AC outlet again.
4. Connect the short-circuit pin of CN201.

[MAIN BOARD] (SIDE A)



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:





- Press the  button continuously for about 10 seconds.
- When the mode is set, “RTs 00c 00e 00” is displayed.
- Set a recordable disc in the unit.
- Press the  button to start recording. Then press the  button and start recording.
- To check the “track mode”, press the  button to start play.
- To exit the test mode, 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

(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)

Fig. 2 Reading the Test Mode Display

Reading the Retry Cause Display

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

Reading the Display:

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

Example

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

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

Reading the Track Mode Display

Hexadecimal	Higher Bits				Lower Bits				Hexa- decimal	Details	
	8	4	2	1	8	4	2	1		When 0	When 1
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01.	
	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”.

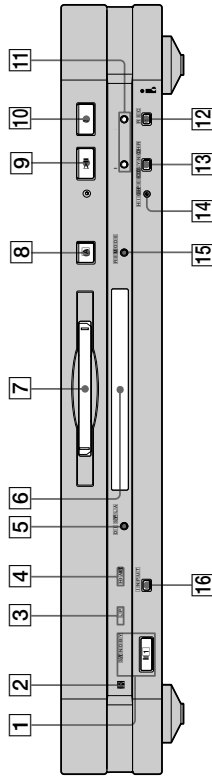
Hexadecimal → Binary Conversion Table

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

Location and Function of Parts

This chapter tells you about the location and function of the various buttons and controls on the front panel and the supplied remote. Further details are provided on the pages indicated in the parentheses. It also tells you about the information that appears in the display window.

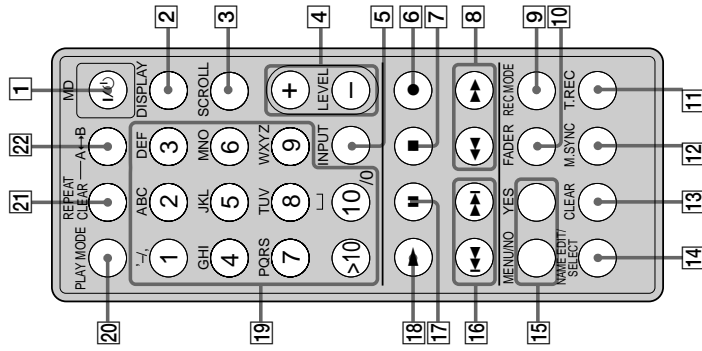
Front Panel Parts Descriptions



- 1** I/O (power) switch(12, 21)
Press to turn on the deck. When you turn on the deck, the STANDBY indicator turns off. When you press the switch again, the deck turns off and the indicator lights up.
- 2** Remote sensor
Point the remote towards this sensor () for remote operations.
- 3** LP indicator (15)
Lights up when LP2 or LP4 mode is selected, or when a track recorded in LP2 or LP4 mode is being played.
- 4** H.A.T.S. indicator
Lights up when the H.A.T.S. function is activated on the receiver.
What is the H.A.T.S. function?
The H.A.T.S. (High-quality digital Audio Transmission System) function on the receiver causes digital audio signals output from an MD deck or the recording source (e.g., a CD player) to be momentarily stored in a buffer in the receiver prior to output. This reduces jitter that sometimes occurs during digital audio transmission.
- 5** DISPLAY button(9, 13, 16, 20, 21)
 - Press when the deck is stopped to display disc information.
 - Press during recording to display information on the track being recorded or recordable time on the MD.
 - Press during play to display information on the current track.
 - Press during Programme Play to display the number of the track currently being played in the programme.
 - Press during recording or recording pause to adjust the recording level.
- 6** Displaywindow(8, 16, 32, 35)
Shows various information. For details, see "Display Window Descriptions" on page 8.
- 7** MD insertion slot(12, 21)
Insert the MD as illustrated below.
With the labelled side up

With the arrow pointing towards the deck
- 8** button(12, 21)
Press to eject the MD.
- 9** button (12, 19, 21, 22)
 - Press when the deck is stopped to start play.
 - Press during playback to pause play.
 - Press during recording to pause recording.
 - Press during playback pause or recording pause to resume play or recording.
- 10** button(12, 20, 21)
Press to stop play or recording, or cancel the selected operation.
- 11** buttons(12, 15, 16, 19, 21, 22)
Press to locate tracks or select a menu item and a setting value.
- 12** REC button (12, 17)
Press to record on the MD or mark track numbers.
- 13** CD SYNCHRO button(19)
Press to start CD Synchrono-recording.
- 14** HIGH SPEED indicator(20)
Lights up when the deck is in High-speed CD Synchrono-recording mode.
- 15** REC MODE button(15)
Press to select one of the following four recording modes: MONO mode (monaural recording), stereo mode (stereo recording), LP2 mode (2 times long recording), and LP4 mode (4 times long recording).
- 16** INPUT button(12)
Press once to display the selected programme source. If the programme source is either the STR-LSA1 or the CDP-LSA1, "▲▲▲" appears momentarily in the display window of the component. Press the button again to switch to another programme source.

Remote Parts Descriptions



- 1 I/O (power) switch(12, 21)**
Press to turn on the deck. When you turn on the deck, the STANDBY indicator on the deck turns off. When you press the switch again, the deck turns off and the indicator lights up.
- 2 DISPLAY button(9, 13, 16, 20, 21, 24)**
Press to stop the information to be displayed in the window.
- 3 SCROLL button(21)**
Press to scroll the name of a track or MD.
- 4 LEVEL +/- buttons(16)**
Press to adjust the recording level.
- 5 INPUT button(12)**
Use to select the programme source to be recorded.
- 6 ● button(12, 17, 19)**
Press to record on the MD or mark track numbers.
- 7 ■ button(12, 20, 21)**
Press to stop play or recording, or cancel the selected operation.
- 8 ◀▶▶▶ buttons(22, 23, 29, 30, 32)**
Press to locate a portion within a track, change the contents of a programme, or shift the cursor to the right.
- 9 REC MODE button(15)**
Press to select one of the following four recording modes: MONO mode (monaural recording), stereo mode (stereo recording), LP2 mode (2 times long recording), and LP4 mode (4 times long recording).
- 10 FADER button(36)**
Press to perform Fade-in Recording or Fade-out Recording.
- 11 T.REC button(18)**
Press to start Time Machine Recording.
- 12 MUSIC SYNC button(19)**
Press to start Music Synchrono-recording.
- 13 CLEAR button(24, 33)**
Press to erase a track in the programme or erase a character.
- 14 NAME EDIT/SELECT button(32, 33)**
Press to add the name or change the name of a track or an MD, or to select the type of characters to be input.

- 15 MENU/NO button (15-19, 25, 26, 28-38)**
Press to display "Edit Menu" or "Setup Menu."
YES button (15-17, 19, 24-26, 28-38)
Press to carry out the selected operation.
- 16 ◀◀▶▶ buttons (12, 15-19, 21, 22, 24-26, 28-38)**
Press to locate tracks, select a menu item and a setting value, or select the character to be input.
- 17 II button(12, 20, 21)**
Press to pause play or recording. Press again to resume play or recording.
- 18 ▶ button (12, 19, 21, 22, 24)**
Press to start play.
- 19 Letter/number buttons (22, 24, 32)**
Press to input letters or numbers.
- 20 PLAY MODE button (24)**
Press to select Shuffle Play or Programme Play.
- 21 REPEAT CLEAR button (23)**
 - Press to play tracks repeatedly.
 - When Repeat All Play or Repeat 1 Play is selected, press to resume normal play.
- 22 A←B button (23)**
Press to select Repeat A-B Play.

Getting Started

This chapter provides information on the supplied accessories, things you should keep in mind while hooking up the system, and how to connect i.LINK components to the MD deck. Be sure to read this chapter thoroughly before you actually connect anything to the deck.

Before You Start the Hookup

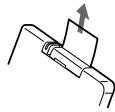
Checking the supplied accessories

This MD deck comes with the following items:

- i.LINK connecting cable (1)
- Remote commander (remote) (1)

Before using the supplied remote

The supplied remote already contains a battery. Before using the remote, pull out the insulating sheet to allow the power to flow from the battery.



To avoid battery leakage

If you don't use the remote for an extended period of time, remove the battery to avoid possible damage from battery leakage and corrosion.

When to replace the battery

Under normal conditions, the battery should last for about six months. When the remote no longer operates the deck, replace the battery with new one.

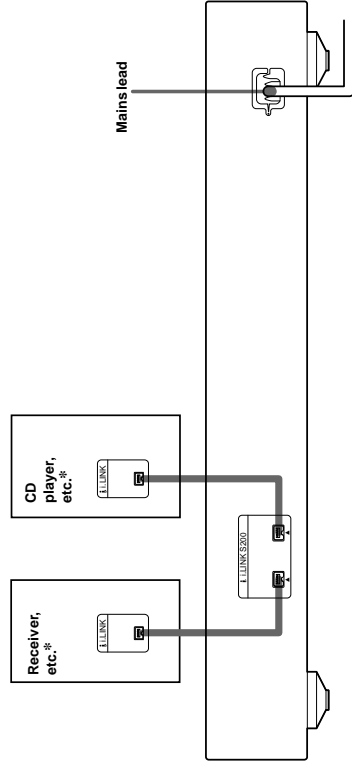
Notes on lithium battery

- Keep the lithium battery out of the reach of the children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when inserting the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING

Battery may explode if misused. Do not recharge, disassemble, or dispose of in fire.

Hooking Up the i.LINK Components



* You can connect the i.LINK components to either i.LINK S200 connector

Required cords

i.LINK connecting cables(2) (only one supplied)



Things you should keep in mind while hooking up the system

- Turn off the power to all components before making any connections.
- Do not connect any mains lead until all the connections are completed.
- Be sure the connections are firm to prevent hum and noise.

About optional i.LINK connecting cables

Be sure to use the Sony i.LINK S200 connecting cables (4 pins-4 pins).

About i.LINK components to be used in combination with the MD deck

The following i.LINK components can be used with the MD deck:

- STR-LSA1 receiver
- CDP-LSA1 CD Player

For general information about i.LINK

See "About i.LINK" on page 38.

Connecting the mains lead

Connect the mains lead of the deck to a wall outlet.

Note

If you use a timer, connect the mains lead to the outlet of the timer.

Jacks for connecting i.LINK components

To the

Receiver or CD player, etc. i.LINK S200 connector

Note on i.LINK component hookups

If a metal object should fall into the i.LINK S200 connector, short-circuiting may occur and damage the components.

Inputs/outputs

i.LINK S200 Jack type: 4-pins to 4-pins

General

Power requirements 230 V AC, 50/60 Hz

Power consumption 18 W

Dimensions (approx.) 430 × 70 × 315 mm (w/h/d) incl. projecting parts and controls

Mass (approx.) 4.4 kg

Supplied accessories

See page 10.

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Design and specifications are subject to change without notice.

Display Messages

The following table explains the various messages that appear in the display. Messages are also displayed by the deck's Self-Diagnosis function (see page 46).

Message	Meaning
Auto Cut	The Auto Cut function is on (page 16).
Blank Disc	A new (blank) or erased MD has been inserted.
CANNOT LINC	You cannot record from the selected component. Select another component. This indication also appears when communication error has occurred between the deck and the selected component while recording. In this case, press ■ on the deck to cancel recording, and then start recording over again.
Cannot Copy	An attempt was made to make a second copy from a digitally dubbed MD (page 14).
Cannot Edit	An attempt was made to edit a premastered MD, to edit the MD while Programme or Shuffle Play is selected, or to change the recording level of an MD recorded in LP2 or LP4 mode.
Cannot Synchrono	Communication between the MD deck and the CD player failed during CD Synchrono-recording.
Disc Full	The MD is full (page 41).
Impossible	The deck cannot do the specified operation (pages 14 and 31).
Incomplete!	S.F. Edit (changing the recording level after recording, Fade-in, or Fade-out) operation failed because the deck was moved while the recording was in progress or the MD is damaged or dirty.

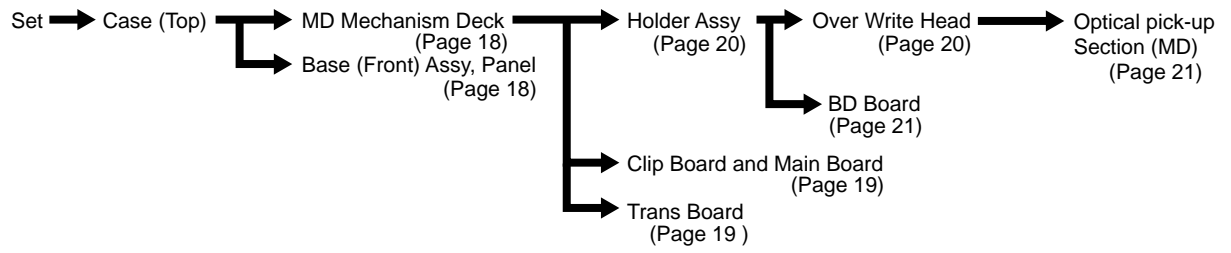
Message

Message	Meaning
Initialize (flashing)	The Setup Menu settings have been lost. Or the contents recorded by timer have disappeared over time and are not be available for saving to disc, or Programme Play could not be activated since the programme has disappeared over time. (The message flashes for about four seconds when you turn on the deck by pressing I/⏪ .)
Name Full	The naming capacity of the MD has reached its limit (about 1,700 characters).
NEW CONNECT	A new component is connected within the i.LINK configuration. This indication also appears when a mains lead or an i.LINK connecting cable of the component within the configuration is connected or disconnected.
No Change	You performed S.F. Edit without specifying the recording level, resulting in no change of recording level.
No Disc	There is no MD in the deck.
No Name	The track or disc has no name.
No Program!!	You tried to start Programme Play when no programme exists.
Premaster ed	An attempt was made to record on a premastered MD.
ProgramFull	The programme contains the maximum number of tracks. You cannot add any more tracks.
REMOTE	The MD deck is being controlled by an external device connected to the deck. * While this indication appears, all the buttons on the deck and the remote become inoperable.
S.F. Edit!	You tried to do another operation while the S.F. Edit is in progress. You cannot perform any other operations at this time.
S.F. Edit NOW	You pressed I/⏪ while in S.F. Edit (changing the recording level after recording, Fade-in, or Fade-out) mode. If you turn off the deck while in S.F. Edit mode, any changes that you have made will not saved properly. Finish the editing and exit S.F. Edit mode before turning off the deck. If you wish to turn off the deck at this time, press I/⏪ again while this indication appears in the display.
Smart Space	The Smart Space function is on (page 16).
TOC Reading	The deck is checking the TOC (Table Of Contents) on the MD.

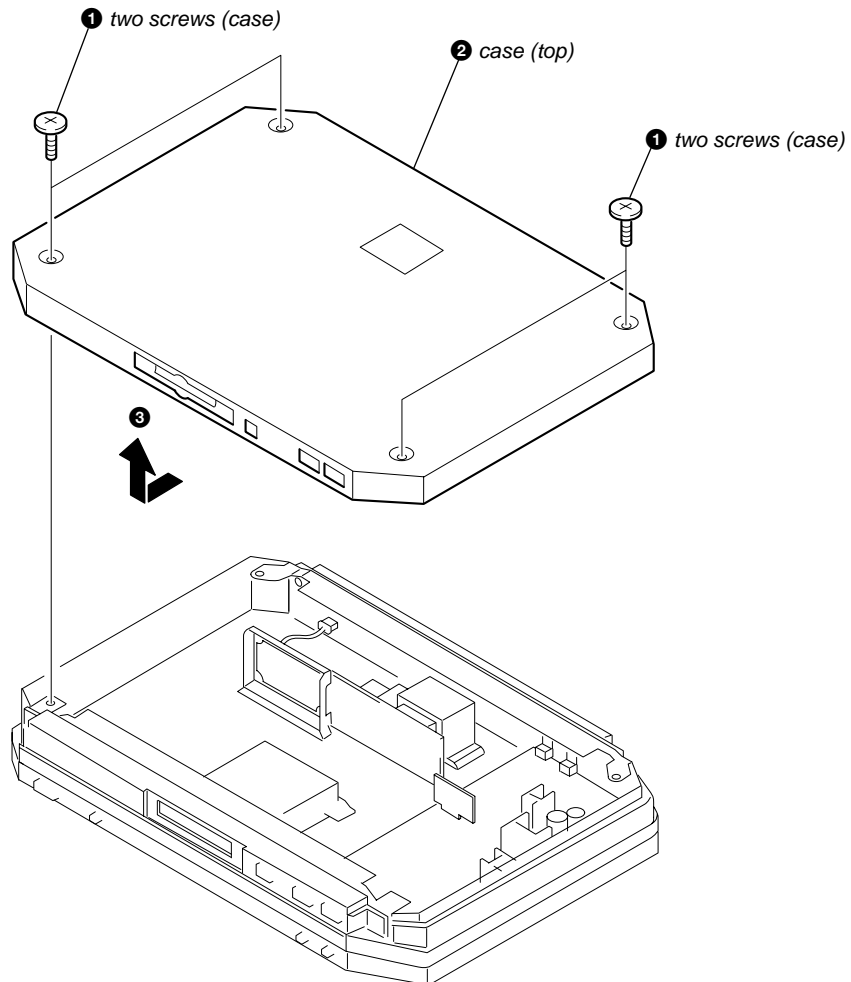
* If "REMOTE" appears under other circumstances, turn off the deck, then turn it on again.

SECTION 3 DISASSEMBLY

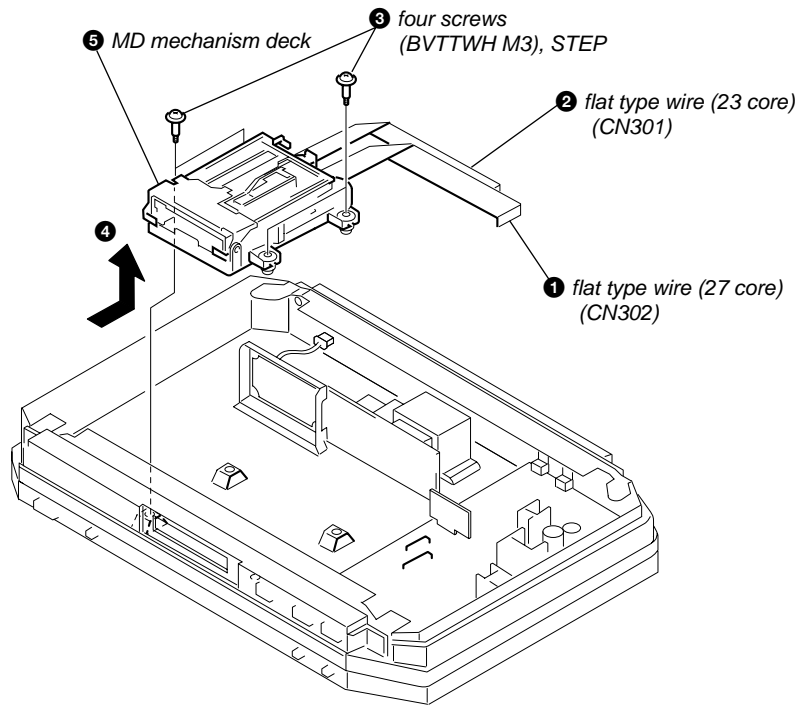
Note : Follow the disassembly procedure in the numerical order given.



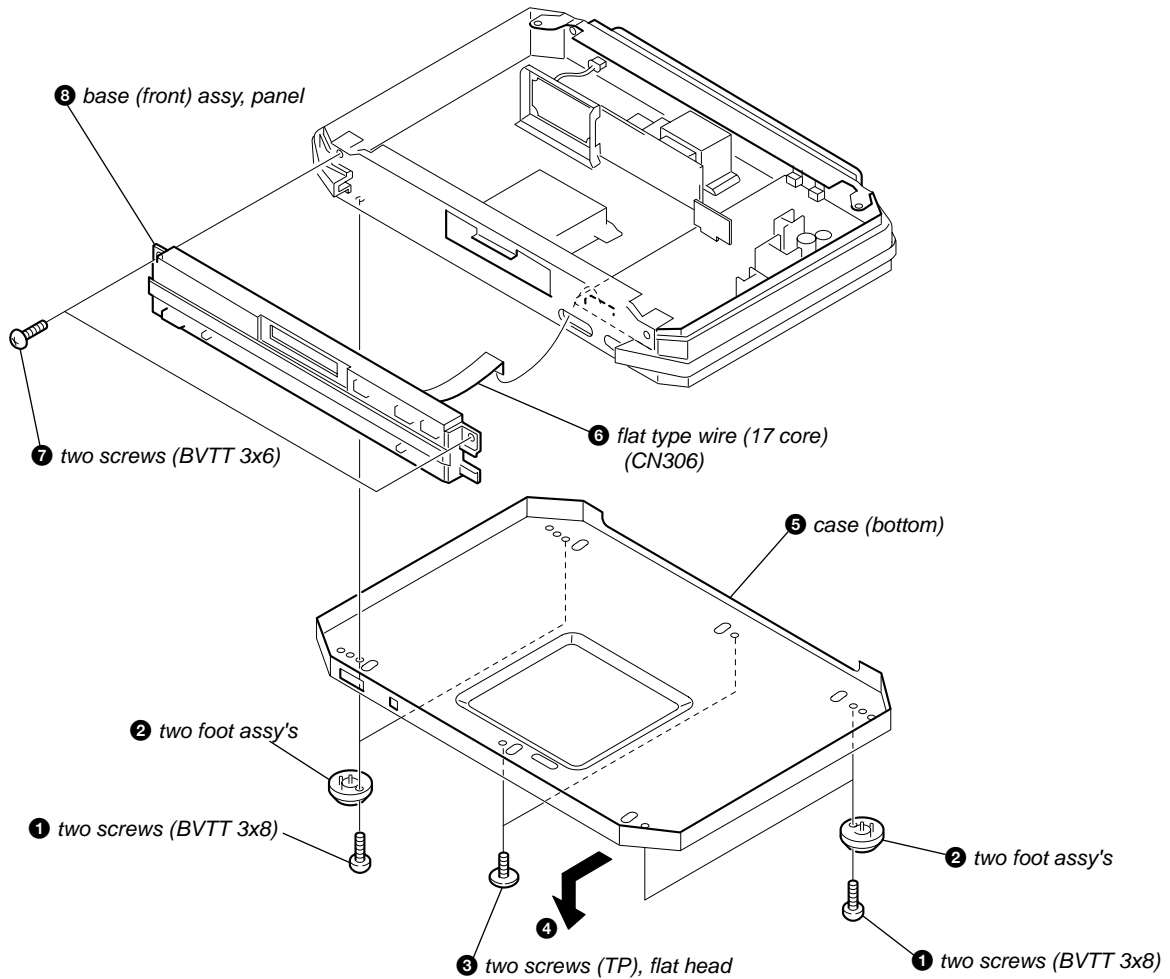
3-1. CASE (TOP)



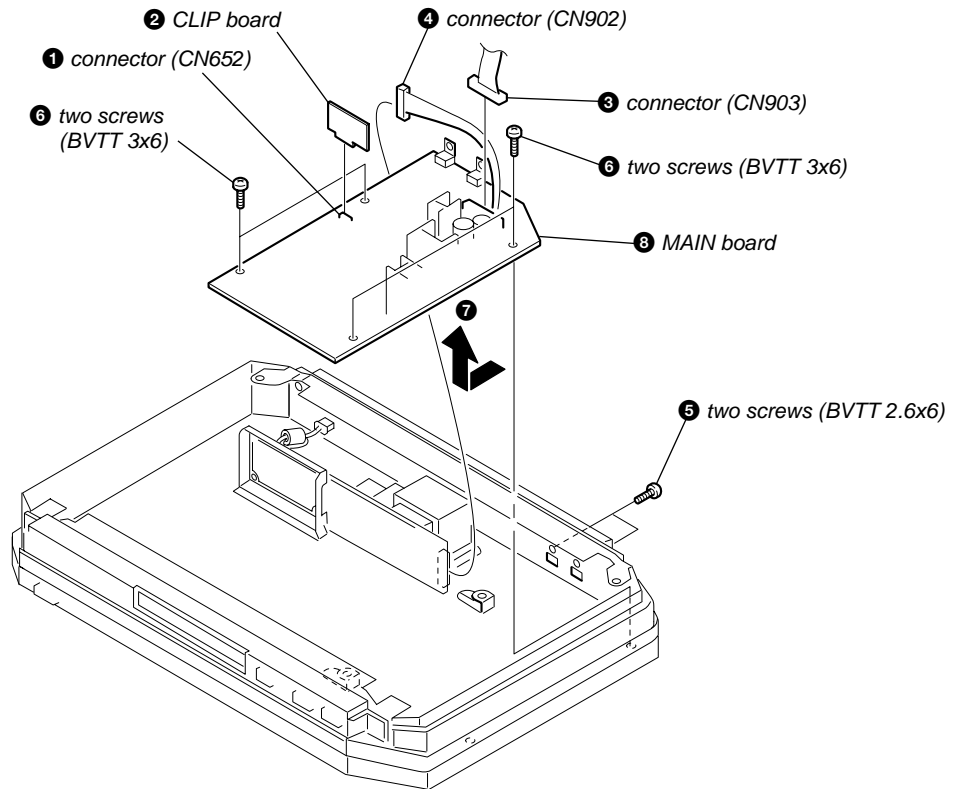
3-2. MD MECHANISM DECK



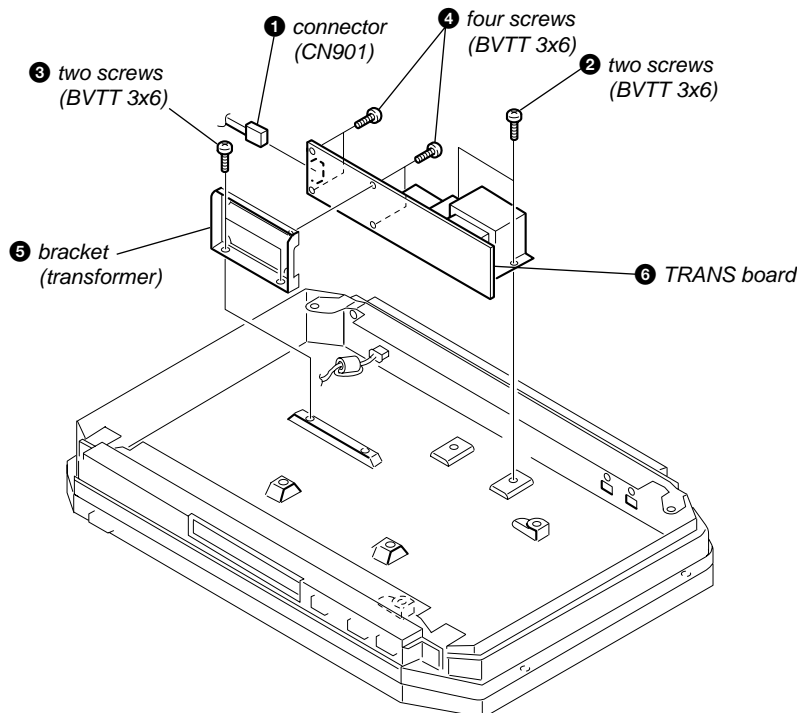
3-3. BASE (FRONT) ASSY, PANEL



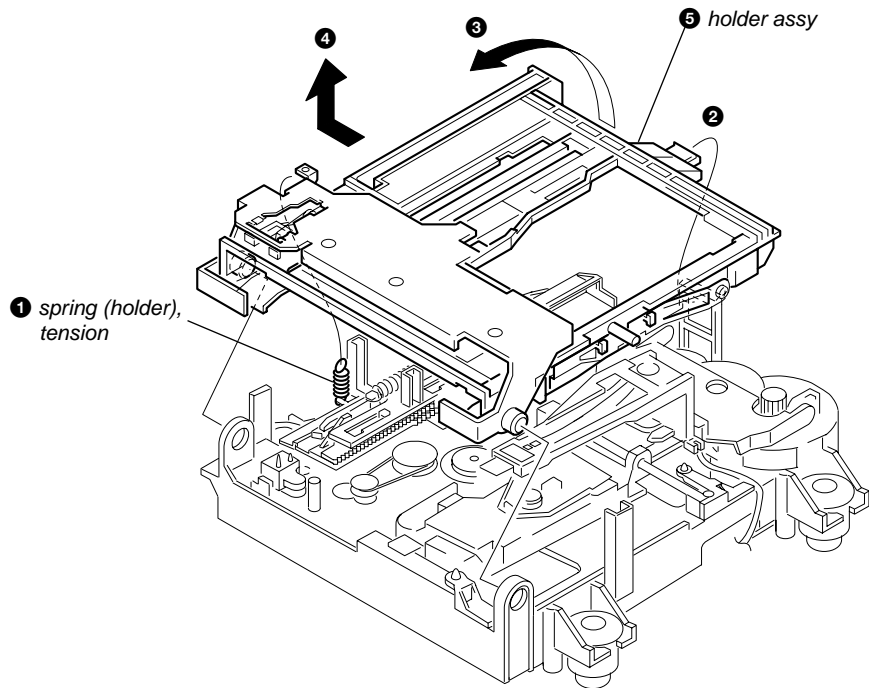
3-4. CLIP BOARD AND MAIN BOARD



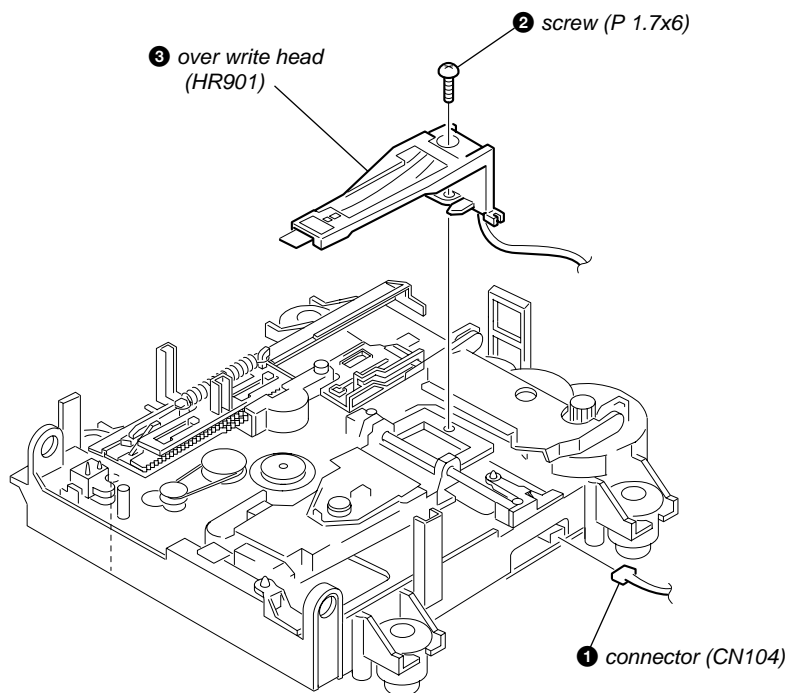
3-5. TRANS BOARD



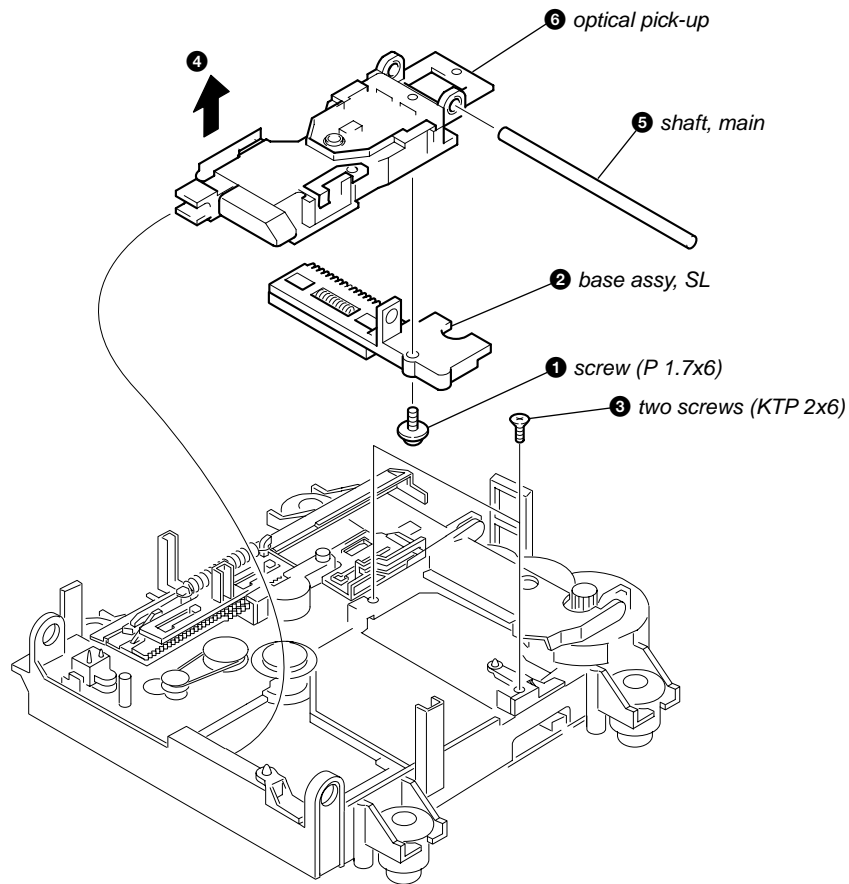
3-6. HOLDER ASSY



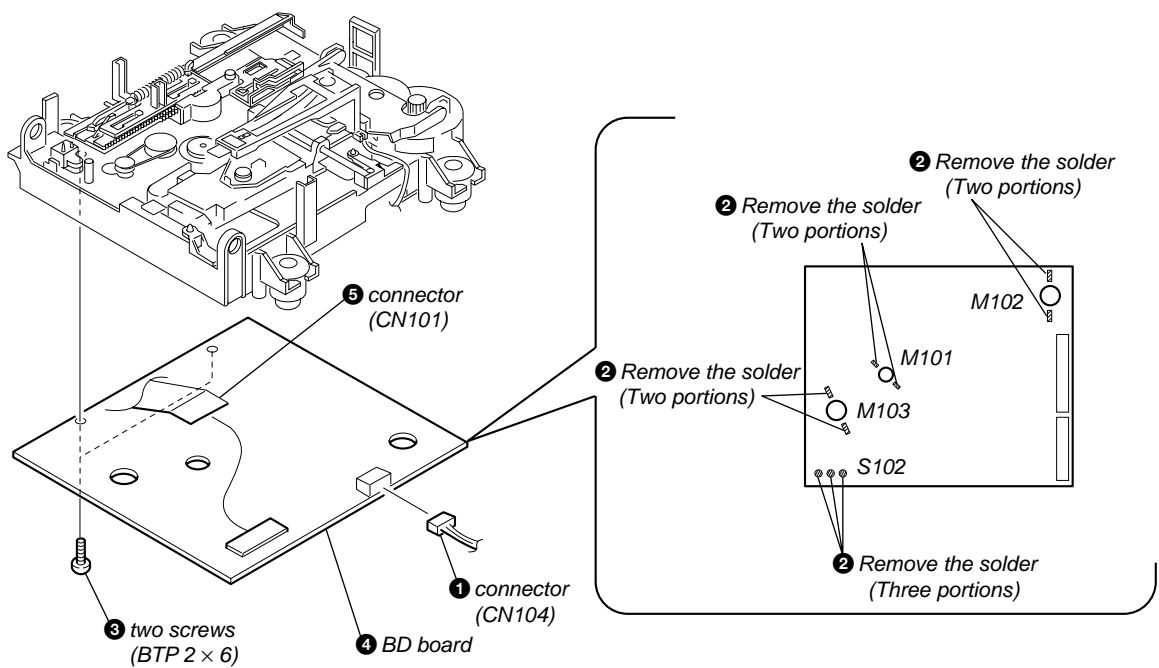
3-7. OVER WRITE HEAD



3-8. OPTICAL PICK-UP (MD) (KMS-262A/J1N)





3-9. BD BOARD




SECTION 4 TEST MODE





4-1. PRECAUTIONS FOR USE OF TEST MODE



- As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
Even if the  button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Be sure to press the  button after pressing the **POWER“X2”** button and the rotation of disc is stopped.

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

- Continuous recording mode (CREC 1MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUS)
- Iop check (Iop Compare)
- Iop value nonvolatile writing (Iop NV Save)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUS)
- When pressing the  button.

4-2. SETTING THE TEST MODE

Procedure : While pressing the  button and  button, connect the power plug to an outlet, and release the  button and  button.

When the test mode is set, “[Check]” will be displayed. Press the  or  button switches between the following three groups; ... ↔ Check ↔ Service ↔ Develop ↔

NOTE: Do not use the test mode in the [Develop] group.





If used, the unit may not operate normally.


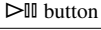


If the [Develop] group is set accidentally, press the  button immediately to exit the [Develop] group.

4-3. EXITING THE TEST MODE

Press the **POWER“X2”** 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  or  button,  button, and  button.
The functions of these buttons are as follows.

Function name	Function
 button	Cancel or move to top hierarchy
 button	Set
 or  button	Select
POWER button*	Set submenu

* **NOTE:** It doesn't work in the ease of “X2” mode.

4-5. SELECTING THE TEST MODE

There are 26 types of test modes as shown below. The groups can be switched by press the  or  button. After selecting the group to be used, press the  button. After setting a certain group, press the  or  button 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  button immediately to exit the [Develop] group.


Display	Details	Mark	Group	
			Check	Service
AUTO CHECK	Automatic self-diagnosis			<input type="radio"/>
Err Display	Error history display, clear			<input type="radio"/>
TEMP ADJUS	Temperature compensation offset adjustment			<input type="radio"/>
LDPWR ADJUS	Laser power adjustment			<input type="radio"/>
Iop Write	Iop data writing			<input type="radio"/>
Iop NV Save	Writes current Iop value in read nonvolatile memory using microprocessor			<input type="radio"/>
EF MO ADJUS	Traverse (MO) adjustment			<input type="radio"/>
EF CD ADJUS	Traverse (CD) adjustment			<input type="radio"/>
FBIAS ADJUS	Focus bias adjustment			<input type="radio"/>
AG Set (MO)	Focus, tracking gain adjustment (MO)			<input type="radio"/>
AG Set (CD)	Focus, tracking gain adjustment (CD)			<input type="radio"/>
TEMP CHECK	Temperature compensation offset check		<input type="radio"/>	<input type="radio"/>
LDPWR CHECK	Laser power check		<input type="radio"/>	<input type="radio"/>
EF MO CHECK	Traverse (MO) check		<input type="radio"/>	<input type="radio"/>
EF CD CHECK	Traverse (CD) check		<input type="radio"/>	<input type="radio"/>
FBIAS CHECK	Focus bias check		<input type="radio"/>	<input type="radio"/>
ScurveCHECK	S-curve check	×	<input type="radio"/>	
VERIFYMODE	Nonvolatile memory check	×	<input type="radio"/>	
DETRK CHECK	Detrack check	×	<input type="radio"/>	
0920 CHECK	Most circumference check	×	<input type="radio"/>	
Iop Read	Iop data display		<input type="radio"/>	<input type="radio"/>
Iop Compare	Comparison with initial Iop value written in nonvolatile memory		<input type="radio"/>	<input type="radio"/>
ADJ CLEAR	Initialization of nonvolatile memory for adjustment values			<input type="radio"/>
INFORMATION	Display of microprocessor version, etc.		<input type="radio"/>	<input type="radio"/>
CPLAY2MODE	Continuous playback mode (CLV2)		<input type="radio"/>	<input type="radio"/>
CREC 2MODE	Continuous recording mode (CLV2)		<input type="radio"/>	<input type="radio"/>

- For details of each adjustment mode, refer to “5. Electrical Adjustments”.
For details of “Err Display”, refer to “Self-Diagnosis Function” on page 2.
- If a different mode has been selected by mistake, press the  button to exit that mode.
- Modes with (X) in the Mark column are not used for servicing and therefore are not described in detail. If these modes are set accidentally, press the  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 Press the  or  button and display “CPLAY2MODE”.
- ③ Press the  button to change the display to “CPLAY2MID”.
- 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  button during continuous playback to change the display as below.

“CPLAY2MID” → “CPLAY2OUT” → “CPLAY2IN”





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  button. The display will change to “CPLAY2MODE”.
- ② Press the  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/palyback check.)

1. Entering the continuous recording mode

- ① Set a recordable disc in the unit.
- ② Press the  or  button and display “CREC 2MODE” .
- ③ Press the  button to change the display to “CREC 2MID”.
- ④ When access completes, the display changes to “CREC 2()” and REC LED lights up.

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


2. Changing the parts to be recorded


- ① When the  button is pressed during continuous recording, the display changes as below.

“CREC 2MID” → “CREC 2OUT” → “CREC 2IN”





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

- ② When access completes, the display changes to “CREC2 ()” and REC LED lights up.


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

3. Ending the continuous recording mode

- ① Press the  button. The display changes to “CREC 2MODE” and REC LED goes off.
- ② Press the  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  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 KEY OPERATIONS IN TEST MODE

POWER "X2"	Reset system and exit from test mode
REC "X2"	Switch CLV mode (CLVS ↔ CLVA)
DISPLAY	Switch display mode
REC MODE "X2"	Switch between bits and groups in servo data
EJECT	Eject disc
▷ PLAY "X2"	Turn servo on (When servo is already on, this key is used to switch the TRK servo on and off.)
■ STOP "X2"	Turn servo off
▶▶ "X2"	Move SLED towards outer circumference
◀◀ "X2"	Move SLED towards inner circumference
CD SYNCHRO	Clear PIT and GRV settings and check for PIT and GRV again
REC	When servo is on, this key is used to begin recording from the current position
DISPLAY "X2"	Used primarily to switch to link sector skip during CPLAY
INPUT	Shift key

4-7. TEST MODE DISPLAYS

Each time the **DISPLAY** 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 ADJUS", "CPLAY2MODE", etc.

2. Error rate display

Displays the error rate in the following way.

C1 = □□□□ AD = □□

C1 = Indicates the C1 error.

AD = Indicates ADER.

3. Address display

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

h = □□□□ s = □□□□ (MO pit and CD)

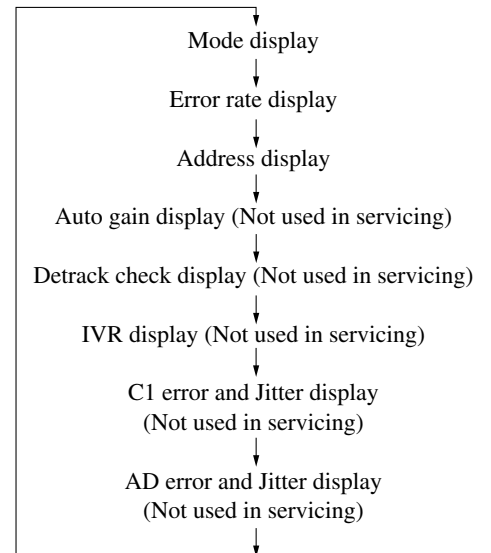
h = □□□□ a = □□□□ (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

Note: "—" is displayed when the address cannot be read.



4-8. MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
▶▶▶ PLAY (LED: GREEN)	Servo ON	Servo OFF
▶▶▶ PAUSE (LED: UMBER)	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
TOC EDIT	CLV low speed mode	CLV normal mode
L.SYNC	ABCD adjustment completed	
OVER(Ber of level meter)	Tracking offset cancel ON	Tracking offset cancel OFF
B/I (REP)	Tracking auto gain OK	
A-/REP	Focus auto gain OK	
LP4	Pit	Groove
LP2	High reflection	Low reflection
SHUF	CLV S	CLV A
MONO	CLV LOCK	CLV UNLOCK
TOC EDIT of frame	Skip ring sector	Do not skip ring sector
X2	Shift key used to change meaning of keys	
PGM	EF BAL being changed	

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 "LDPWR CHECK" and "Iop compare".

Procedure

1. Press the button. If "LDPWR ミチエツク" is displayed, it means that the laser power check has not been performed. In this case, perform the "LDPWR 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 button.
2. The software version will be displayed.
3. Press the 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 button and button together.
4. Press the or button and select MDM-7X2B.
5. Press the button. If the nonvolatile memory is successfully overwritten, the normal test mode will be set and a message to select the test mode will be displayed.

4-12. i.LINK TEST MODE

Switching into iLINK test mode

1. Press the **INPUT** button and **■** button and keep the buttons pressed down while the power is on.
2. Version information will then be displayed on the display.
3. Press the **◀◀** or **▶▶** button to select the mode.
4. Press the **DISPLAY** button to exit from i.LINK mode.
Press the **REC MODE** button to clear the counter.

DISPLAY '0', '1', and '2' will be displayed each time the **DISPLAY** button is pressed and the command will then be executed.

NO.	DISPLAY 0	DISPLAY 1	DISPLAY 2	Description	Note
1	Vxxxxxxxx			Firmware version Display firmware update number	
2	Node unique ID			Display Node unique ID	
3	Root Yes (No)			Display root	Not used service
4	NID. xxxx/xx			Number of units connected to Node ID	Not used service
5	Forceroot			Bus reset Pressing the REC MODE button will be executed	Not used service
6	B. Rst xxx			Bus reset counter Display total number of times bus has been reset Pressing the REC MODE button resets this counter to zero.	A bus reset is performed if signals cannot be transmitted as a result of failed connector or cable connections.
7	G.C xx			Gap count Display current gap count	Not used service
8	Async xxx			ASYNC packet reception counter Display the total number of ASYNC packets (excluding ACK) received so far. Pressing the REC MODE button resets this counter to zero.	The counter is incremented whenever a command is received from another unit. A ping signal should be transmitted from another unit to check to make sure that the counter has been incremented and that commands may be received properly.
9		0008 zzzzzzzz		Node ID Register	Not used service
10		0018 zzzzzzzz		Split Timeout Hi Register	
11		001C zzzzzzzz		Split Timeout Low Register	
12		0204 zzzzzzzz		Bus Time Register	
13		0210 zzzzzzzz		Busy Timeout Register	
14		0220 zzzzzzzz		Bandwidth Available Register	
15		0224 zzzzzzzz		Channel Available Hi Register	
16		0228 zzzzzzzz		Channel Available Low Register	
17		0900 zzzzzzzz		Output Master Plug Register	
18		0904 zzzzzzzz		Output Plug Control Register	
19		0980 zzzzzzzz		Input Master Plug Register	
20		0984 zzzzzzzz		Input Plug Control Register	
21		0000 zzzzzzzz		LINK IC Register [00]	
22		0004 zzzzzzzz		LINK IC Register [04]	
23		0008 zzzzzzzz		LINK IC Register [08]	
24		000C zzzzzzzz		LINK IC Register [0C]	
25		0010 zzzzzzzz		LINK IC Register [10]	
26		0014 zzzzzzzz		LINK IC Register [14]	
27		0018 zzzzzzzz		LINK IC Register [18]	
28		001C zzzzzzzz		LINK IC Register [1C]	
29		0020 zzzzzzzz		LINK IC Register [20]	
30		0024 zzzzzzzz		LINK IC Register [24]	
31		0028 zzzzzzzz		LINK IC Register [28]	
32		002C zzzzzzzz		LINK IC Register [2C]	
33		0030 zzzzzzzz		LINK IC Register [30]	
34		0034 zzzzzzzz		LINK IC Register [34]	
35		0038 zzzzzzzz		LINK IC Register [38]	
36		003C zzzzzzzz		LINK IC Register [3C]	
37		0040 zzzzzzzz		LINK IC Register [40]	
38		0044 zzzzzzzz		LINK IC Register [44]	
39		0048 zzzzzzzz		LINK IC Register [48]	
40		004C zzzzzzzz		LINK IC Register [4C]	
41		0050 zzzzzzzz		LINK IC Register [50]	
42		0054 zzzzzzzz		LINK IC Register [54]	
43		0058 zzzzzzzz		LINK IC Register [58]	
44		005C zzzzzzzz		LINK IC Register [5C]	
45		0060 zzzzzzzz		LINK IC Register [60]	
46		0064 zzzzzzzz		LINK IC Register [64]	
47		0068 zzzzzzzz		LINK IC Register [68]	

NO.	DISPLAY 0	DISPLAY 1	DISPLAY 2	Description	Note
48		006C zzzzzzzz		LINK IC Register [6C]	
49		0070 zzzzzzzz		LINK IC Register [70]	
50		0074 zzzzzzzz		LINK IC Register [74]	
51		0078 zzzzzzzz		LINK IC Register [78]	
52		007C zzzzzzzz		LINK IC Register [7C]	
53		0080 zzzzzzzz		LINK IC Register [80]	
54		0084 zzzzzzzz		LINK IC Register [84]	
55		0088 zzzzzzzz		LINK IC Register [88]	
56		0090 zzzzzzzz		LINK IC Register [90]	
57		0094 zzzzzzzz		LINK IC Register [94]	
58		0098 zzzzzzzz		LINK IC Register [98]	
59		00A0 zzzzzzzz		LINK IC Register [A0]	
60		00A4 zzzzzzzz		LINK IC Register [A4]	
61		00A8 zzzzzzzz		LINK IC Register [A8]	
62		00AC zzzzzzzz		LINK IC Register [AC]	
63		00B0 zzzzzzzz		LINK IC Register [B0]	
64		00B4 zzzzzzzz		LINK IC Register [B4]	
65		00B8 zzzzzzzz		LINK IC Register [B8]	
66		00BC zzzzzzzz		LINK IC Register [BC]	
67		00C0 zzzzzzzz		LINK IC Register [C0]	
68		00C4 zzzzzzzz		LINK IC Register [C4]	
69		00C8 zzzzzzzz		LINK IC Register [C8]	
70		00CC zzzzzzzz		LINK IC Register [CC]	
71		00D0 zzzzzzzz		LINK IC Register [D0]	
72		00D4 zzzzzzzz		LINK IC Register [D4]	
73		00D8 zzzzzzzz		LINK IC Register [D8]	
74		00DC zzzzzzzz		LINK IC Register [DC]	
75		00E0 zzzzzzzz		LINK IC Register [E0]	
76		00E4 zzzzzzzz		LINK IC Register [E4]	
77		00F0 zzzzzzzz		LINK IC Register [F0]	
78		00F4 zzzzzzzz		LINK IC Register [F4]	
79		00F8 zzzzzzzz		LINK IC Register [F8]	
80		00FC zzzzzzzz		LINK IC Register [FC]	

NOTE: • It is only the indication of DISPLAY 0 from No. 1 (Vxxxxxxx) to No. 8 (Async xxx).
• It is only the indication of DISPLAY 1 from No. 9 (Note IDR) to No. 80 (LINK IC [FC]).

LIST OF i.LINK COMMANDS

No.	Description	Examples of causes of errors	Display on next model	Messages displayed in i.LINK test mode	Display mode	Description of C code
1	LINC error (Note that there are two types of errors corresponding to each side.)	Selected devices have 63 links and no more links can be established. STR-LSA1 have 63 links and no more links can be established.	Unit establishing link: Cannot link Unit being linked to: Cannot link • When an attempt is made to establish a link from device A (i.e., a PC) to device B, and a link cannot be established between device A and device B because device B is already linked to another device C, "Remote" will be displayed on device B and a "Cannot link" message will be displayed on device A. • When an attempt is made to establish a link from device B (i.e., an MD) to device C (i.e., a CD) and the CD is already linked to another device D (e.g., an MD), a "Cannot link" message will be displayed on device B and a "Remote" message displayed on device C.	12 P-to-P error 31 P-to-P error	C78: 11 (When i.LINK device has been selected) C78: 12 (TUNER, ANALOG)	• Remote device link • Home device link Device to which an attempt was made to establish a link is already linked (i.e., connected) to another device.
2	Reserve error (Note that there are two types of errors corresponding to each side.)	Unable to reserve (Specified device is already reserved and cannot be controlled.)	Unit establishing link: Cannot link Unit being linked to: Cannot link • When an attempt is made to establish a link from device A (i.e., a PC) to device B, and a link cannot be established between device A and device B because device B is already linked to another device C, "Remote" will be displayed on device B and a "Cannot link" message will be displayed on device A. • When an attempt is made to establish a link from device B (i.e., an MD) to device C (i.e., a CD) and the CD is already linked to another device D (e.g., an MD), a "Cannot link" message will be displayed on device B and a "Remote" message displayed on device C.		C78: 16 C78: 17	• Remote device reserved • Home device reserved Device to which an attempt was made to reserve the device has already been reserved by another device.
3	EMPTY	When an empty packet has been received after establishing a link. (This problem occurs when the opposing playing is not in operation, when an MD is used to select input for a CD which is not being replayed, and when a CD is not being replayed when recording from a CD to an MD.)	NO SIGNAL		C78: 21	• Waiting for input State in which link has been properly established (i.e., signals may be transmitted over bus) but no signal has yet been sent.
4	Invalid format	This problem occurs when a signal in a separate format (i.e., a signal which cannot be replayed) is detected (i.e., when recording to an MD when the channel is being used for DV signals).	NO SIGNAL	22 Not IEC958 conf. 23 Invalid value in bit n 25 Invalid frequency 26 Not linear PCM 24 Unlocked	C78: 22	• An attempt has been made to transmit a signal over a broadcast channel. Sony DVs are designed to allow the use of 63 channels. MDs also have the same design, and it is impossible to use the same channel after it has already been used (i.e., the same channel cannot be used again without the ability to obtain channel authorization).
5	UNLOCK	Invalid signal clock detected at a time when i.LINK IC PLL is not locked. (This error occurs when connected to a unit with improperly designed output signal circuits.)	NO SIGNAL		C78: 31	• Unable to perform clock synchronization The remote device has been poorly designed and communications have reached the limit of stable PLL (where the PLL is a chip used to stabilize the clock). Home device okay; fault lies with remote device.
6	NO SIGNAL	No input signals detected at a time when i.LINK device has been selected. (This error occurs when no input signals are detected after switching from optical input to i.LINK input.)	NO SIGNAL	21 No signal	C78: 04	• No input signal (Used for units able to perform i.LINK switching without linking.)
7	NO SIGNAL	No input signals detected in i.LINK mode. (This problem occurs when the power of the opposing unit is turned off after linking.)	NO SIGNAL		C78: 23	• No input signal because remote device not powered on (Used for units requiring linking for i.LINK input switching.)
8	Unable to output signal (No ISO resource found)	Unable to interrupt output because bus is being used to capacity. (This error occurs when multiple DV signals are being output and the bus is too busy to generate an interrupt.)	BUS FULL	13 Insufficient input bandwidth 14 Channel full at input time 32 Insufficient output bandwidth 33 Channel full at output time	C78: 15	• Bus full Number of signals being transmitted over the bus exceeds the maximum amount of signals which may be transmitted.
9	LOOP	A group has been created as a result of i.LINK cable connections.	LOOP CONNECT		C78: 03	• i.LINK failure Displayed on all units connected.
10	Bus reset generation	Bus reset has been generation. (This occurs when a new device has been connected or a device has been disconnected.)	NEW CONNECT (Display flashes twice)			• Bus reset Not displayed in C code because too complicated.
11	Bus reset generation during recording	Bus reset has been generation during recording. (This occurs when a new device has been connected or a device has been disconnected.)	NEW CONNECT		C78:32	• Bus reset Displayed only for recording unit. (C code displayed only on MD when recording from a CD to an MD.)

Note 1 : i.LINK messages displayed only in upper-case characters.

Note 2 : Distinctions between "No signal" and "Cannot link" messages made by C code.

Note 3 : Note that No. 9 may not always be properly detected.

Comment 1 : As before, a "Can't copy" message is displayed when it is impossible to record because of SCMS restrictions.

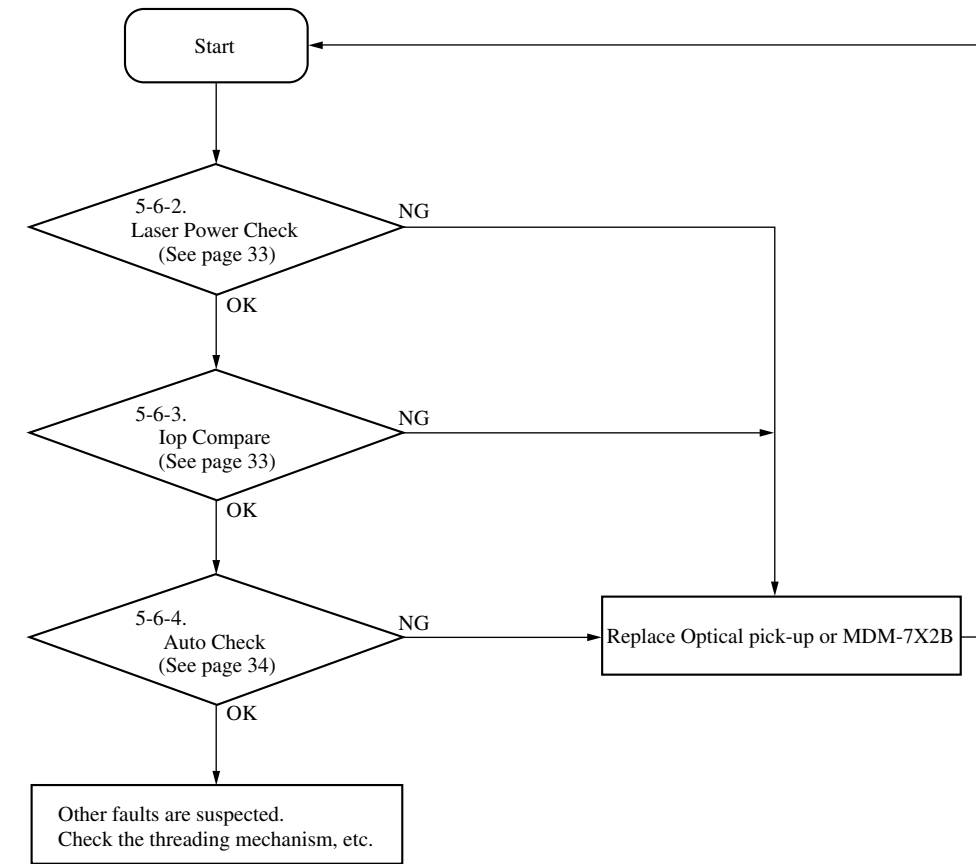
Comment 2 : C code C78 represents an improper connection (i.LINK connection).

SECTION 5 ELECTRICAL ADJUSTMENTS

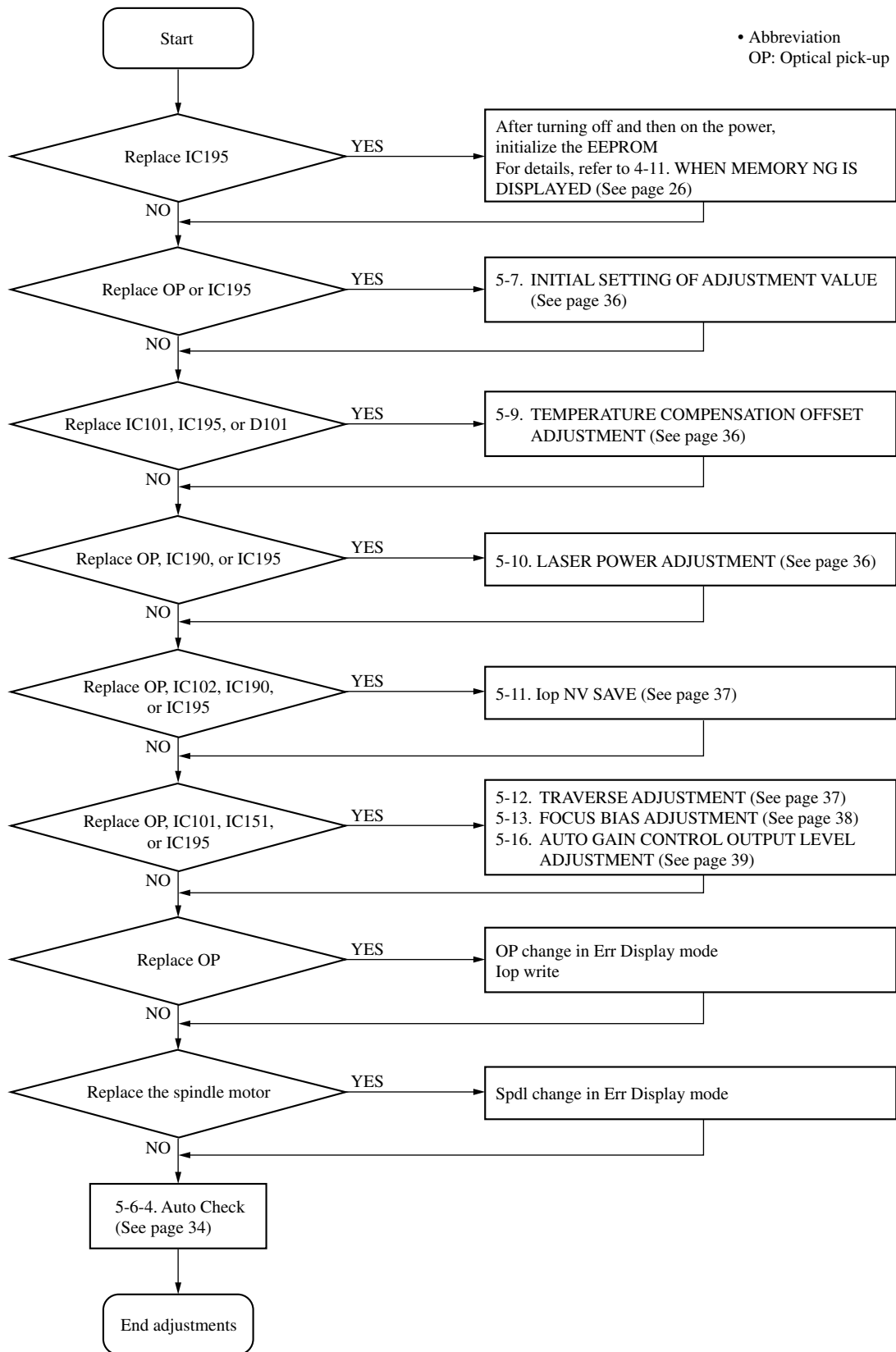
5-1. PARTS REPLACEMENT AND ADJUSTMENT

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

Check before replacement



Adjustment flow

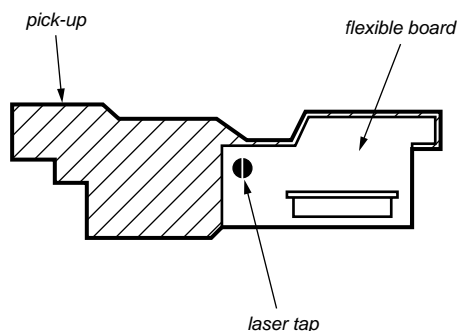


5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

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

5-3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-262A)

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



Optical pick-up flexible board

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 7.)
- 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	IC102	IC151	IC190	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	○	○	×	○	○	○	×

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. Press the or button and display "CREC 2MODE".
 3. Press the button again to display "CREC 2MID".
Display "CREC 2(0300)" and start to recording.
 4. Complete recording within 5 minutes.
 5. Press the button and stop recording .
 6. Press the 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 28°C.

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.

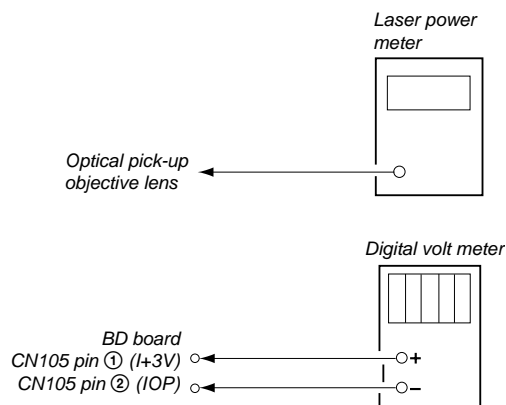
Checking Procedure:

1. Press the or button to display "TEMP CHECK".
2. Press the 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 the Iop Information.)

Connection :



Checking Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the 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, press the or button and display "LDPWR CHECK".
3. Press the button once and display "LD 0.9 mW \$ ".
Check that the reading of the laser power meter become 0.84 to 0.92 mW.
4. Press the button once more and display " LD 7.0 mW \$ ". Check that the reading the laser power meter and digital volt meter satisfy the specified value.

Specified Value :

Laser power meter reading : 7.0 ± 0.2 mW

Digital voltmeter reading : Optical pick-up displayed value $\pm 10\%$
(Optical pick-up label)

KMS262A
20101
H0576

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

Iop = 57.6 mA in this case

Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

5. Press the button and display "LDPWR CHECK" and stop the laser emission.
(The button is effective at all times to stop the laser emission.)

Note 1: After step 4, each time the button is pressed, the display will be switched between "LD 0.7 mW \$ ", "LD 6.2 mW \$ ", and "LD 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. Press the or button to display "Iop Compare".
2. Press the button and start measurements.
3. When measurements complete, the display changes to " $\pm xx\%yy$ ".
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 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 "LDPWR CHECK" and "Top compare".

Procedure

1. Press the button. If "LDPWR ミチエック" is displayed, it means that the laser power check has not been performed. In this case, perform the "LDPWR CHECK" and "Top 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.

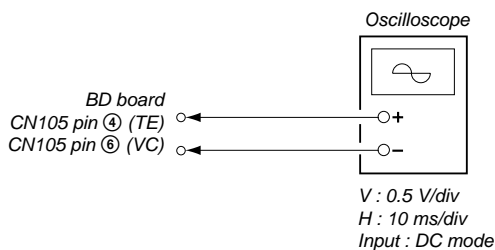
5-6-6. Traverse Check

5-6-7. Focus Bias Check

5-6-8. C PLAY Check

5-6-9. Self-Recording/Playback Check

5-6-6. Traverse Check



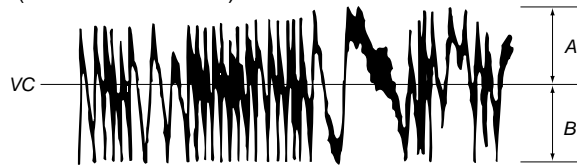
Connection :

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. Press the or button and display "EF MO CHECK".
5. Press the 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 press the or button.
(Read power traverse checking)

(Traverse Waveform)



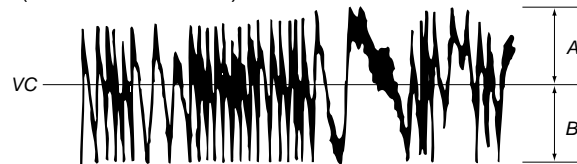
Specified value : Below 10% offset value

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

7. Press the button and display "EFB = MO-W".

8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not press the or button.
(Write power traverse checking)

(Traverse Waveform)



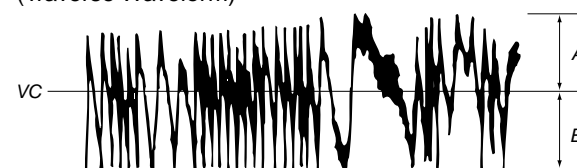
Specified value : Below 10% offset value

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

9. Press the 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 press the or button.

(Traverse Waveform)



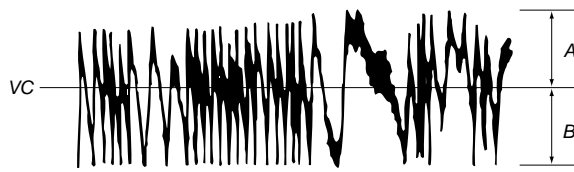
Specified value : Below 10% offset value

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

11. Press the button display "EF MO CHECK".
The disc stops rotating automatically.
12. Press the button and remove the disc.
13. Load the check disc (MD) TDYS-1.
14. Press the or button and display "EF CD CHECK".
15. Press the button and display "EFB = CD". Servo is imposed automatically.

- Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not press the button.

(Traverse Waveform)



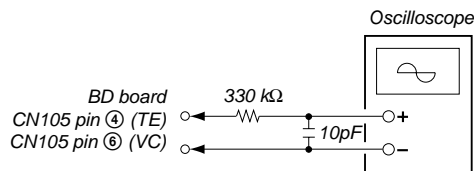
Specified value : Below 10% offset value

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

- Press the button and display “EF CD CHECK”.
- Press the 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 :

- Load a continuously recorded test disc (MDW-74/GA-1). (Refer to “5-5. Using the Continuously Recorded Disc”.)
- Press the or button and display “CPLAY2MODE”.
- Press the button and display “CPLAY2MID”.
- Press the button when “C = [] AD = []” is displayed.
- Press the or button and display “FBIAS CHECK”.
- Press the button and display “ []/[] c = []”.

The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.

Check that the C1 error is below 20 and ADER is below 2.

- Press the button and display “ []/[] b = []”.
- Check that the C1 error is below 100 and ADER is below 2.
- Press the button and display “ []/[] a = []”.
- Check that the C1 error is below 100 and ADER is below 2.
- Press the button, next press the button, and remove the test disc.

5-6-8. C PLAY Check

MO Error Rate Check

Checking Procedure :

- Load a continuously recorded test disc (MDW-74/GA-1). (Refer to “5-5. Using the Continuously Recorded Disc”.)
- Press the or button and display “CPLAY2MODE”.
- Press the button and display “CPLAY2MID”.
- The display changes to “C1 = [] AD = []”.
- If the C1 error rate is below 20, check that ADER is 00.
- Press the button, stop playback, press the button, and test disc.

CD Error Rate Check

Checking Procedure :

- Load a check disc (MD) TDYS-1.
- Press the or button and display “CPLAY2MODE”.
- Press the button twice and display “CPLAY2MID”.
- The display changes to “C1 = [] AD = []”.
- Check that the C1 error rate is below 20.
- Press the button, stop playback, press the 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 :

- Insert a recordable test disc (MDW-74/GA-1) into the unit.
- Press the or button to display “CREC 2MODE”.
- Press the button to display the “CREC 2MID”.
- When recording starts, REC LED is displayed, this becomes “CREC 2(@ @ @ @)” (@ @ @ @ is the address), and recording starts.
- About 1 minute later, press the button to stop continuous recording.
- Press the or button to display “CPLAY2MODE”.
- Press the button to display “CPLAY2MID”.
- “C1 = [] AD = []” will be displayed.
- Check that the C1 error becomes below 20 and the AD error below 2.
- Press the button to stop playback, and press the 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 for Adjustments” and execute the initial setting before the adjustment as required.

Setting Procedure :

1. Press the or button to display “ADJ CLEAR” .
2. Press the 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 button and button, connect the power plug to the outlet, and release the button and button.
2. Press the or button to display “[Service]”, and press the button.
3. Press the or button to display “Iop Write” , and press the 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 : Press the or button.
To select the digit : Press the button.
6. When the 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 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. Press the button to display “Iop Read” .
2. “@@.@/###.#” is displayed and the recorded contents are displayed.
@@.@ indicates the Iop value labeled on the optical pick-up.
###.# indicates the Iop value after adjustment
3. To end, press the 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. Press the or button and display “TEMP ADJUS” .
2. Press the button and select the “TEMP ADJUS” mode.
3. “TEMP = [OK]” and the current temperature data will be displayed.
4. To save the data, press the button.
When not saving the data, press the button.
5. When the button is pressed, “TEMP = SAVE” will be displayed and turned back to “TEMP ADJUS” display then.
When the button is pressed, “TEMP ADJUS” will be displayed immediately.

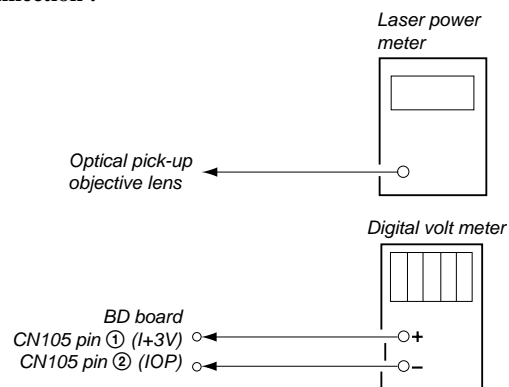
Specified Value :

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

5-10. LASER POWER ADJUSTMENT

Check the Iop value of the optical pick-up before adjustments. (Refer to 5-8. Recording and Displaying the 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 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. Press the or button and display “LDPWR ADJUS”.
(Laser power : For adjustment)
3. Press the button once and display “LD 0.9 mW \$ ”.
4. Press the or button so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the button after setting the range knob of the laser power meter, and save the adjustment results. (“LD SAVE \$ ” will be displayed for a moment.)
5. Then “LD 7.0 mW \$ ” will be displayed.

- Press the or button so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the button and save it.

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

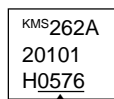
- Then, press the or button and display “LDPWR CHECK”.
- Press the button once and display “LD 0.9 mW \$ ”. Check that the reading of the laser power meter become 0.85 to 0.91 mW.
- Press the button once more and display “LD 7.0 mW \$ ”. Check that the reading the laser power meter and digital volt meter satisfy the specified value.
Note down the digital voltmeter reading value.

Specified Value :

Laser power meter reading : 7.0 ± 0.2 mW

Digital voltmeter reading : Optical pick-up displayed value $\pm 10\%$

(Optical pick-up label)



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

Iop = 57.6 mA in this case

Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

- Press the button and display “LDPWR CHECK” and stop the laser emission.
(The button is effective at all times to stop the laser emission.)
- Press the or button to display “Iop Write”.
- Press the button. When the display becomes Ref=@@@.@ (@ is an arbitrary number), press the button to display “Measu=@@@.@” (@ is an arbitrary number).
- The numbers which can be changed will blink. Input the Iop value noted down at step 9.
To select the number : Press the or button.
To select the digit : Press the button.
- When the 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 button is pressed, the display will be switched between “LD 0.7 mW \$ ”, “LD 6.2 mW \$ ”, and “LD 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 optical pick-up and when replacing the IC102. Otherwise the optical pick-up check may deteriorate.

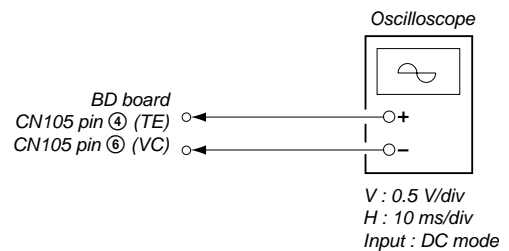
Note: Perform this function with the optical pick-up set at room temperature.

Procedure

- Press the or button to display “Iop NV Save”.
- Press the button and display “Iop [stop]”.
- After the display changes to “Iop =xxsave?”, press the button.
- After “Complete!” is displayed momentarily, the display changes to “Iop 7.0 mW”.
- After the display changes to “Iop=yysave?”, press the button.
- When “Complete!” is displayed, it means that Iop NV saving has been completed.

5-12. TRAVERSE ADJUSTMENT

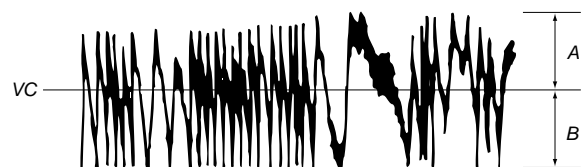
Connection :



Adjusting Procedure :

- Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) of the BD board.
- Load a test disc (MDW-74/GA-1). (Refer to Note 1.)
- Press the button and move the optical pick-up outside the pit.
- Press the or button and display “EF MO ADJUS”.
- Press the button and display “EFB = MO-R”.
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
- Press the or button so that the waveform of the oscilloscope becomes the specified value.
(When the or button is pressed, the of “EFB = ” changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Read power traverse adjustment)

(Traverse Waveform)

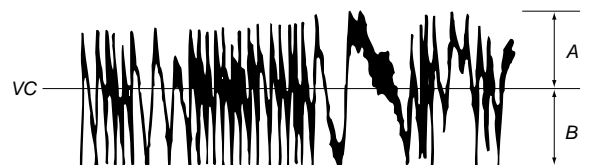


Specification $A = B$

- Press the 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).
- Press the or button so that the waveform of the oscilloscope becomes the specified value.
(When the or button is pressed, 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)

- Press the button, and save the adjustment results in the

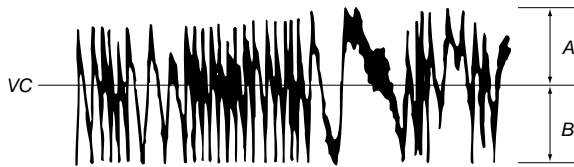


Specification $A = B$

- non-volatile memory. (“EFB = SAVE” will be displayed for a moment.)
- “EFB = MO-P”. will be displayed.
The optical pick-up moves to the pit area automatically and servo is imposed.

- Press the or button 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.

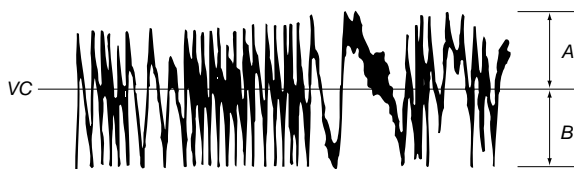
(Traverse Waveform)



Specification $A = B$

- Press the 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.
- Press the button and remove the disc.
- Load the check disc (MD) TDYS-1.
- Press the or button and display “EF CD ADJUS”.
- Press the button and display “EFB = CD”. Servo is imposed automatically.
- Press the or button 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)

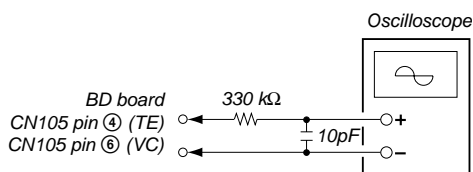


Specification $A = B$

- Press the button, display “EFB = SAVE” for a moment and save the adjustment results in the non-volatile memory.
Next “EF CD ADJUS” will be displayed.
- Press the 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.



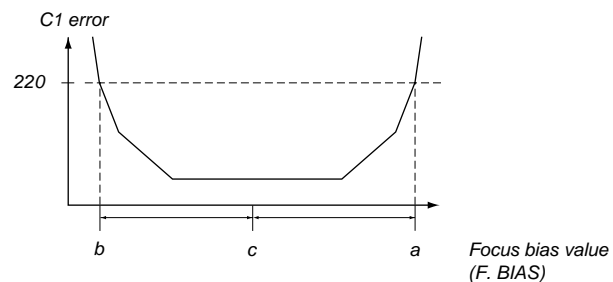
5-13. FOCUS BIAS ADJUSTMENT

Adjusting Procedure :

- Load a test disk (MDW-74/GA-1).
- Press the or button and display “CPLAY2MODE”.
- Press the button and display “CPLAY2MID”.
- Press the button when “C1 = AD = ” is displayed.
- Press the or button and display “FBIAS ADJUS”.
- Press the button and display “/ a = ”.
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
- Press the or button in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220 (Refer to Note 2).
- Press the button and display “/ b = ”.
- Press the or button in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
- Press the button and display “/ c = ”.
- Check that the C1 error rate is below 20 and ADER is 00. Then press the button.
- If the “()” in “ - - ()” is above 20, press the button.
If below 20, press the button and repeat the adjustment from step 2.
- Press the button to remove the test disc.

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








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



5-14. ERROR RATE CHECK








5-14-1. CD Error Rate Check

Checking Procedure :

1. Load a check disc (MD) TDYS-1.
2. Press the  or  button and display "CPLAY2MODE".
3. Press the  button twice and display "CPLAY2MID".
4. The display changes to "C1 =  AD = .
5. Check that the C1 error rate is below 20.
6. Press the  button, stop playback, press the  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. Press the  or  button and display "CPLAY2MODE".
3. Press the  button and display "CPLAY2MID".
4. The display changes to "C1 =  AD = .
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the  button, stop playback, press the  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. Press the  or  button and display "CPLAY2MODE".
3. Press the  button twice and display "CPLAY2MID".
4. Press the  button when "C1 =  AD =  is displayed.
5. Press the  or  button and display "FBIAS CHECK".
6. Press the  button and display "/  c = .
- The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
Check that the C1 error is below 20 and ADER is below 2.
7. Press the  button and display "/  b = .
- Check that the C1 error is below 100 and ADER is below 2.
8. Press the  button and display "/  a = .
- Check that the C1 error is below 100 and ADER is below 2.
9. Press the  button, next press the  button, and remove the continuously recorded disc.

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





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. Press the  or  button to display "AG Set (CD)".
3. When the  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  button to remove the disc.

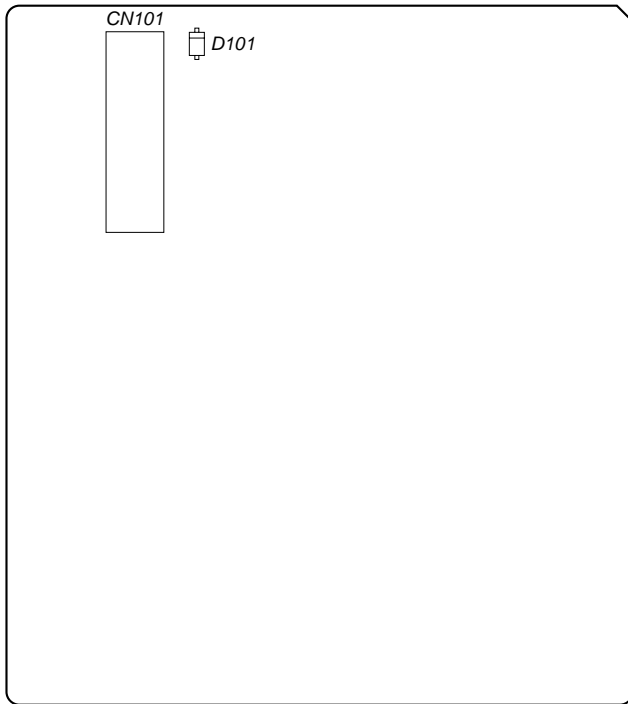
5-16-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :

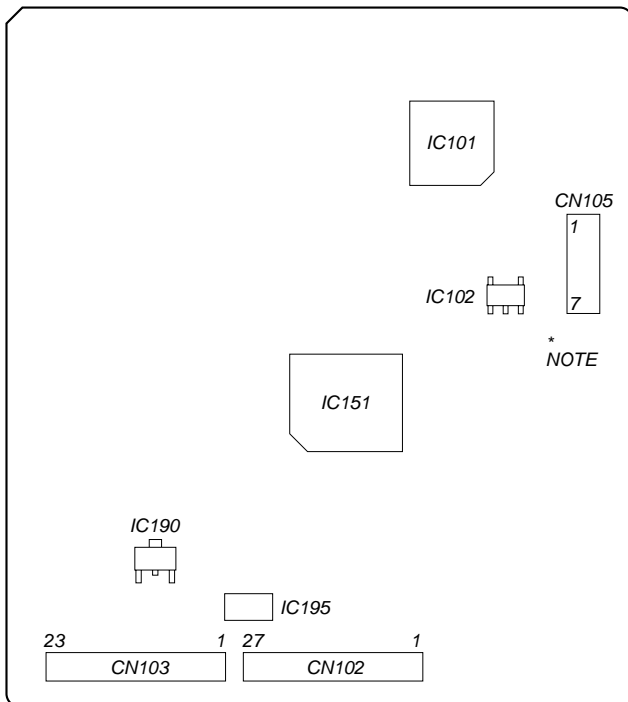
1. Insert the reference disc (MDW-74/GA-1) for recording.
2. Press the  or  button to display "AG Set (MO)".
3. When the  button is pressed, the adjustment will be performed automatically.
"Complete!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)".
4. Press the  button to remove the disc.

5-17. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



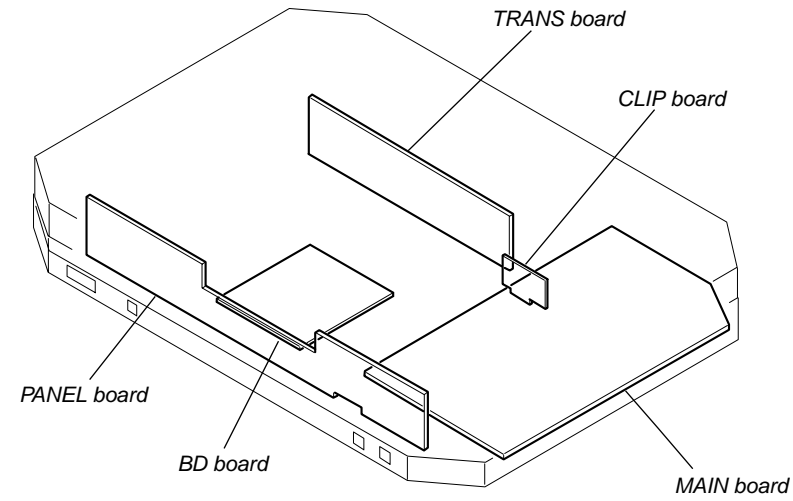
[BD BOARD] (SIDE B)



NOTE:It is useful to use the jig. for checking the waveform. (Refer to Servicing Note on page 7.)

**SECTION 6
DIAGRAMS**




6-1. CIRCUIT BOARDS LOCATION



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: μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- Δ : internal component.
-  : nonflammable resistor.
-  : fusible resistor.
-  : panel designation.





Note:

The components identified by mark Δ or dotted line with mark Δ 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.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
-  : PB
-  : REC
-  : PB (DIGITAL OUT)
-  : REC (DIGITAL IN)

For printed wiring boards.

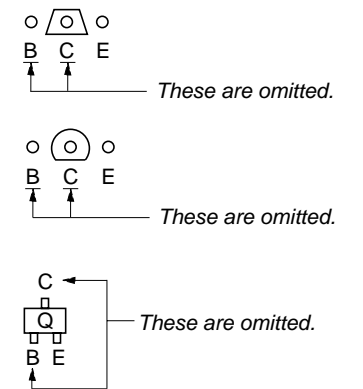
Note:

-  : 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:

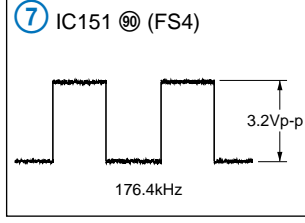
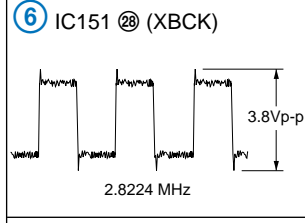
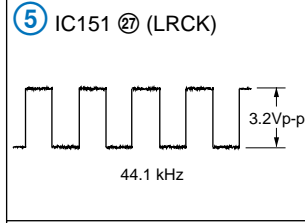
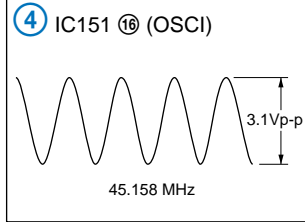
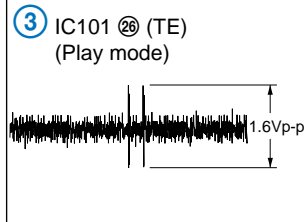
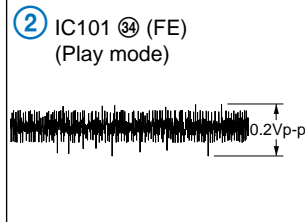
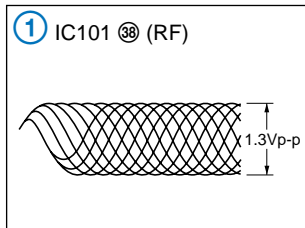
Pattern face side: Parts on the pattern face side seen from the (Side B) pattern face are indicated.
Parts face side: Parts on the parts face side seen from the (Side A) parts face are indicated.

• Indication of transistor

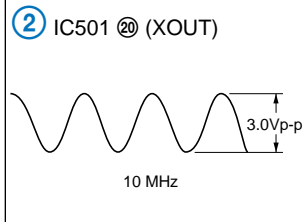
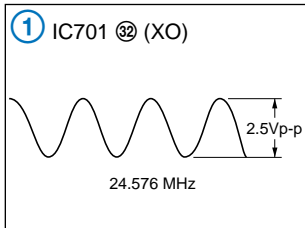


• WAVEFORMS

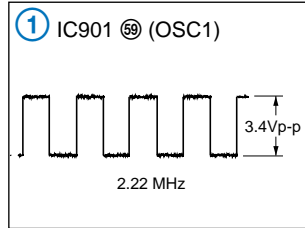
– BD Board –



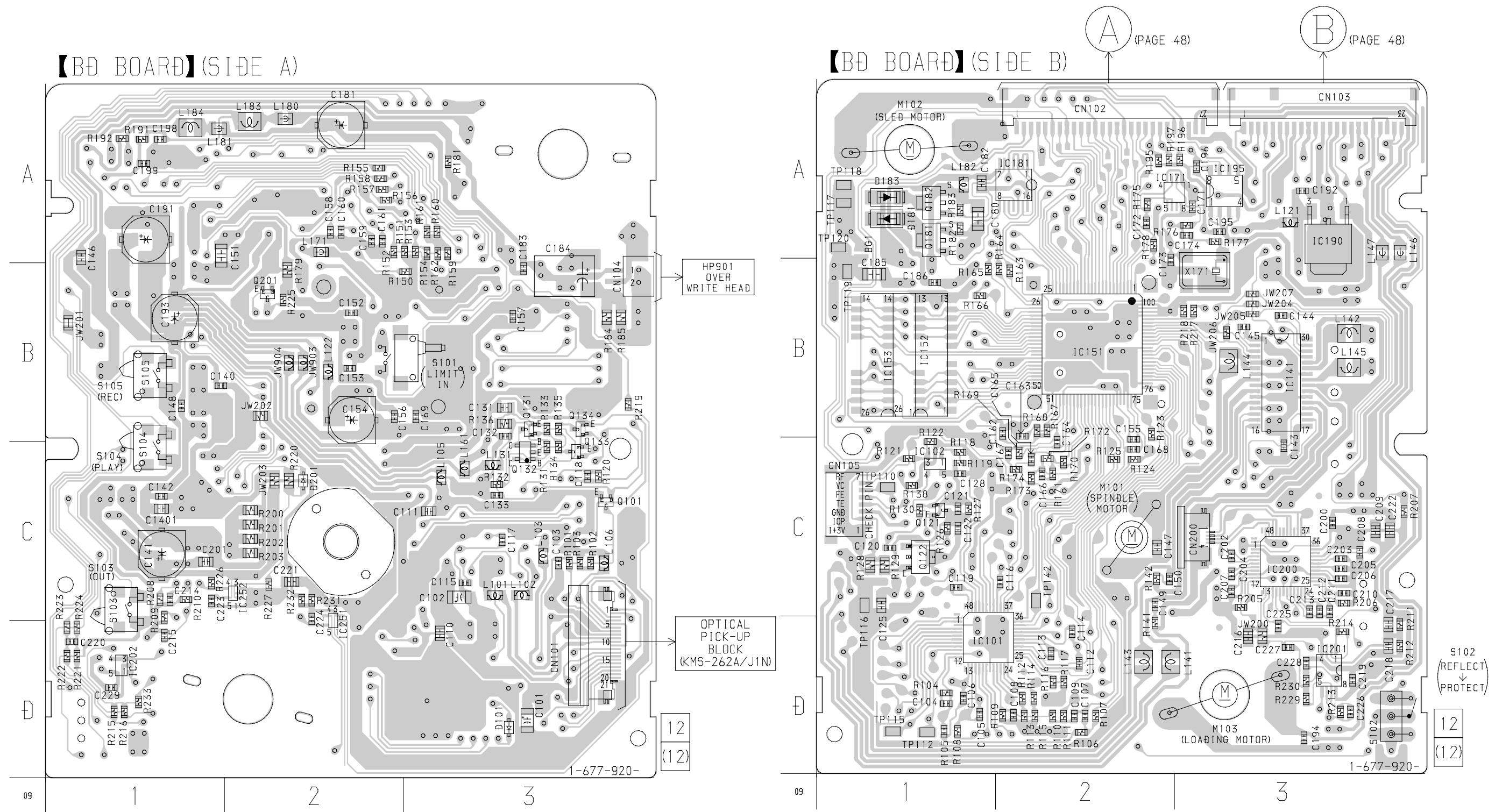
– MAIN Board –



– PANEL Board –



6-3. PRINTED WIRING BOARD – BD SECTION – • See page 41 for Circuit Board Location.



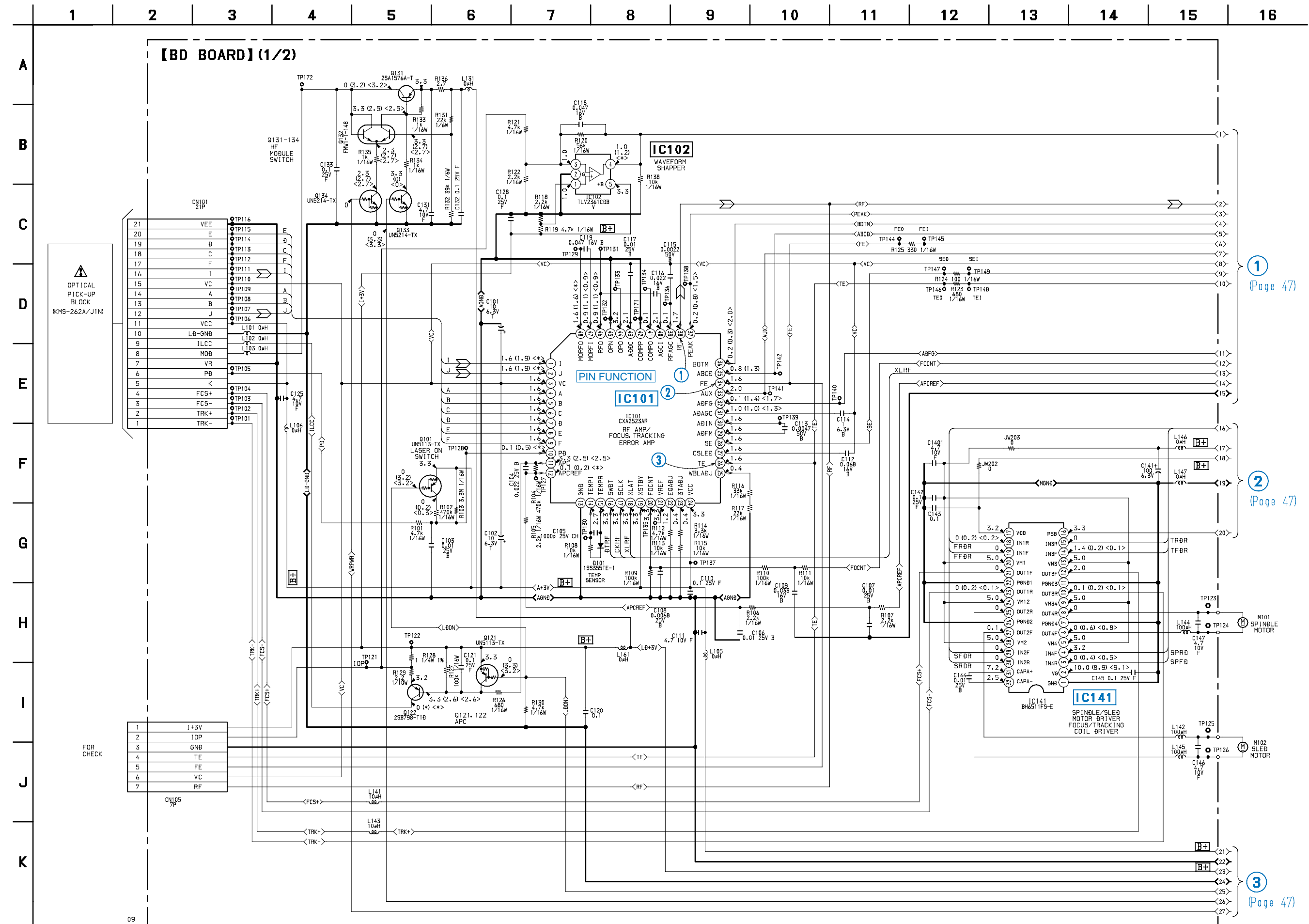
• Semiconductor Location

Ref. No.	Location
D101	D-3
Q101	C-3
Q131	B-3
Q132	C-3
Q133	C-3
Q134	B-3

• Semiconductor Location

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

There are a few cases that the part isn't mounted in model is printed on diagram.



① (Page 47)

② (Page 47)

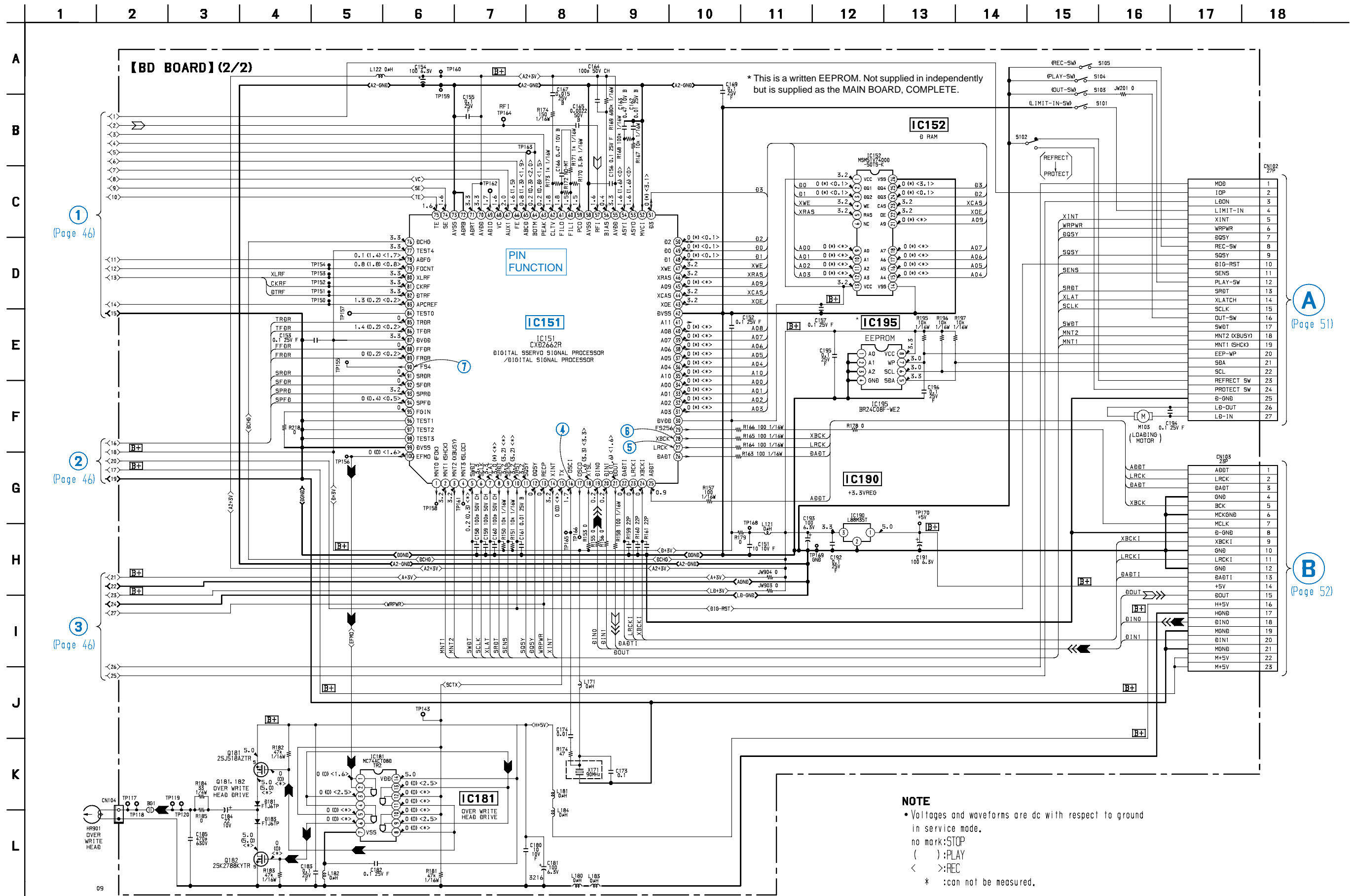
③ (Page 47)

NOTE

- Voltages and waveforms are dc with respect to ground in service mode.
- no mark: STOP
- (): PLAY
- < >: REC
- * : can not be measured.

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

6-5. SCHEMATIC DIAGRAM – BD SECTION (2/2) – • See page 44 for Waveforms. • See page 56 for IC Block Diagrams. • See page 60 for IC Pin Functions. • See page 45 for Printed Wiring Board.



1 (Page 46)

2 (Page 46)

3 (Page 46)

A (Page 51)

B (Page 52)

6-6. PRINTED WIRING BOARD – MAIN SECTION (SIDE A) – • See page 41 for Circuit Board Location.

【MAIN BOARD】(SIDE A)



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	B-2	D790	D-1
D102	B-2	D791	E-1
D201	B-2	D792	E-2
D202	B-2	D801	B-9
D203	B-2		
D204	B-2	IC501	C-7
D206	B-2	IC502	B-7
D207	B-5	IC601	D-4
D208	B-5	IC602	D-5
D401	C-2	IC655	E-4
D402	B-1	IC656	E-4
D789	E-1	IC701	D-2

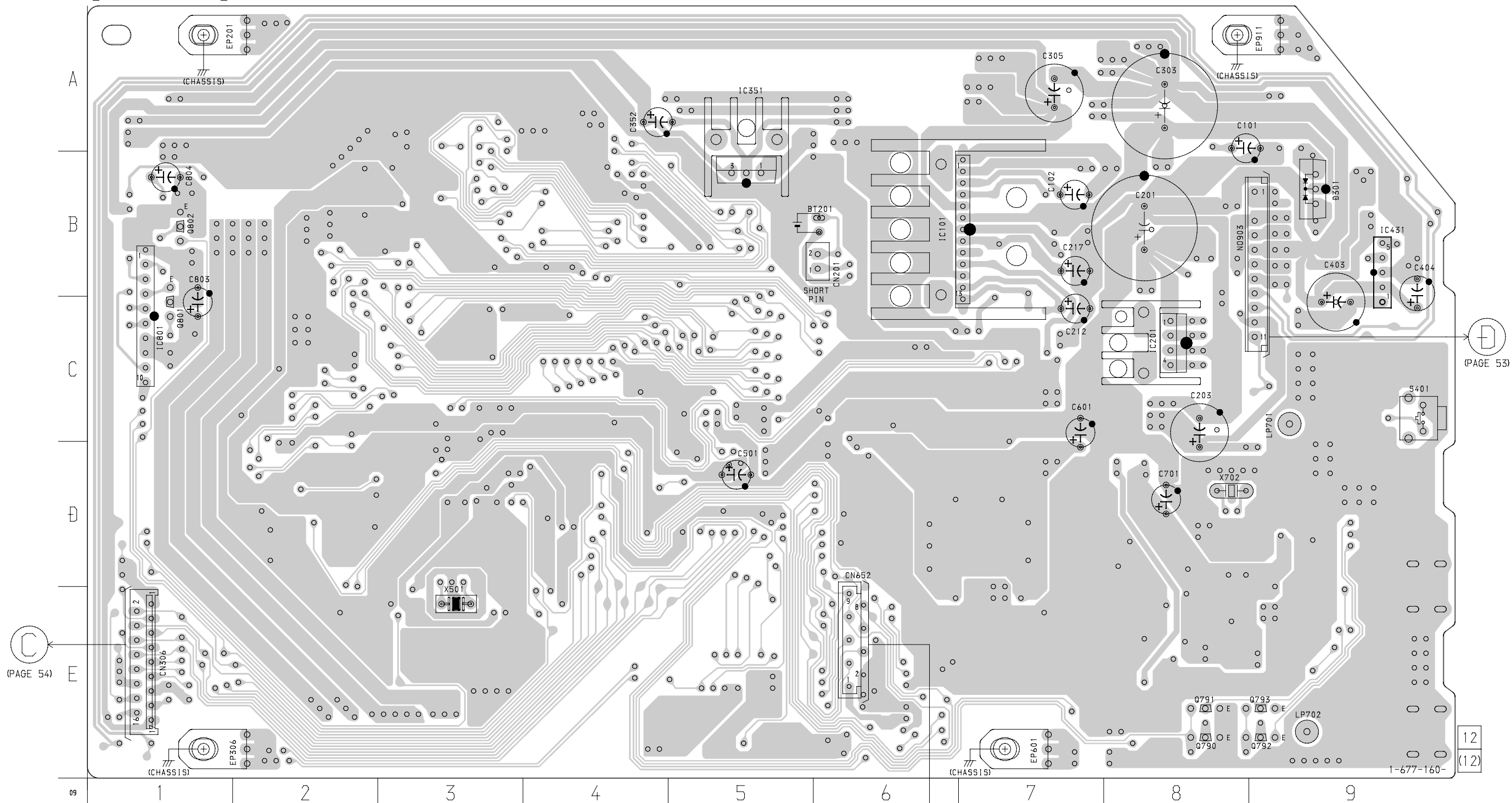
(B)
(PAGE 45)

(A)
(PAGE 45)

There are a few cases that the part isn't mounted in model is printed on diagram.

6-7. PRINTED WIRING BOARD – MAIN SECTION (SIDE B) – • See page 41 for Circuit Board Location.

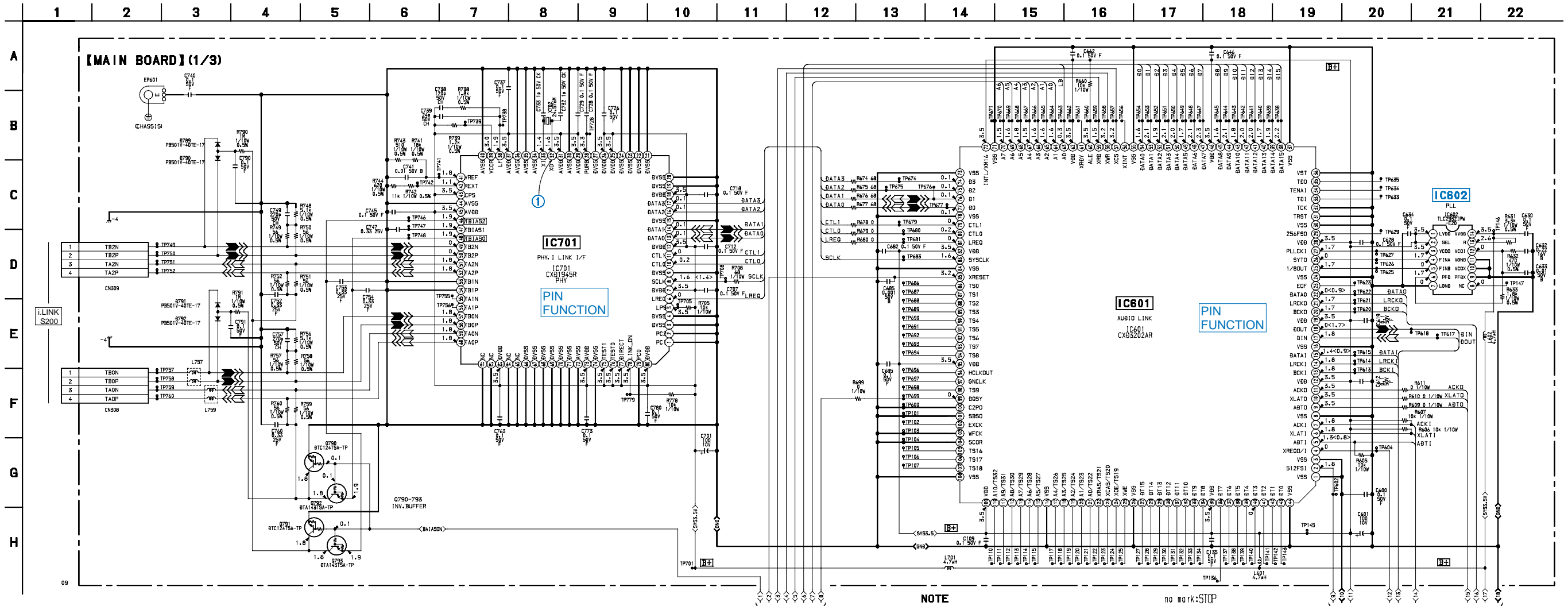
【MAIN BOARD】(SIDE B)



• Semiconductor Location

Ref. No.	Location
D301	B-9
IC101	B-6
IC201	C-8
IC351	A-5
IC431	B-9
IC801	C-1
Q790	E-8
Q791	E-8
Q792	E-9
Q793	E-9
Q801	C-1
Q802	B-1

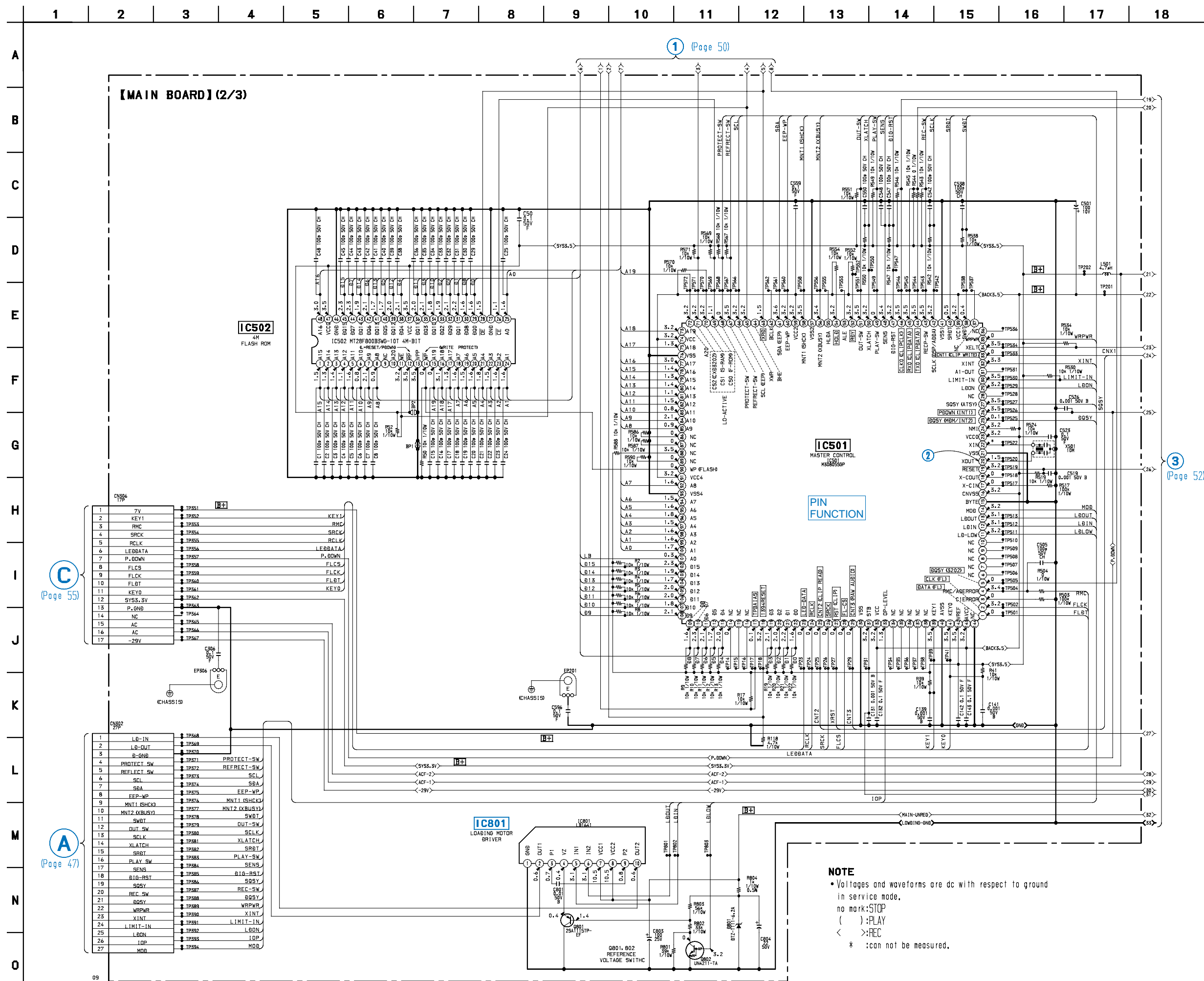
There are a few cases that the part isn't mounted in model is printed on diagram.



① (Page 51)

NOTE
 • Voltages and waveforms are dc with respect to ground () :PLAY
 < > :REC
 * : can not be measured.

② (Page 52)

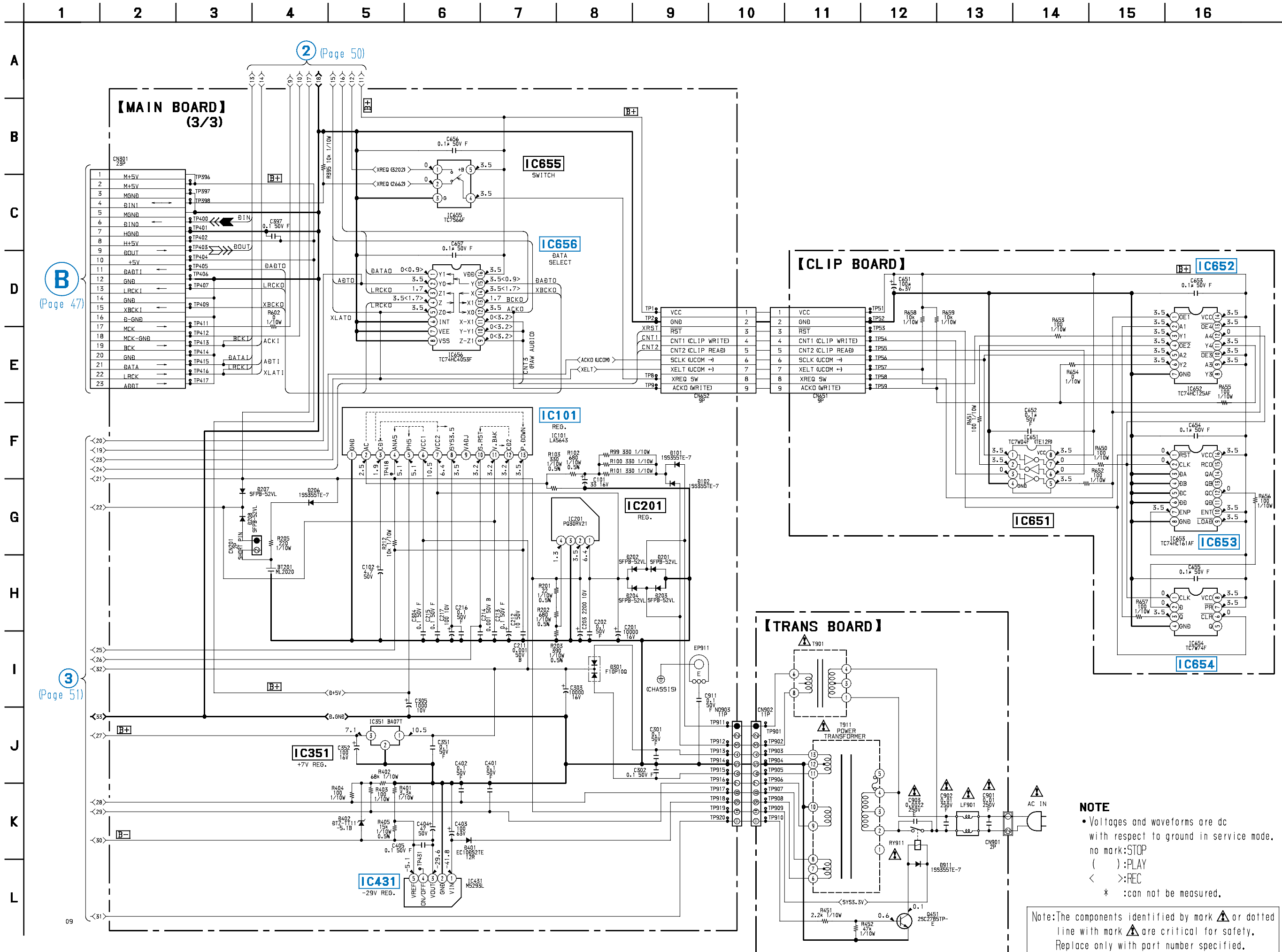


1 (Page 50)

3 (Page 52)

C (Page 55)

A (Page 47)

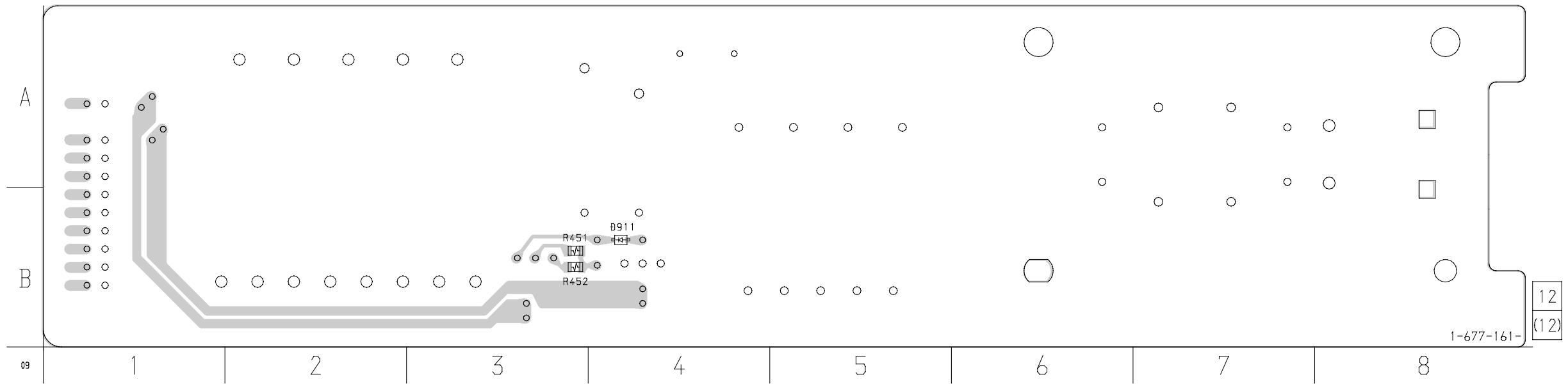


NOTE
 • Voltages and waveforms are dc with respect to ground in service mode.
 () : PLAY
 < > : REC
 * : can not be measured.

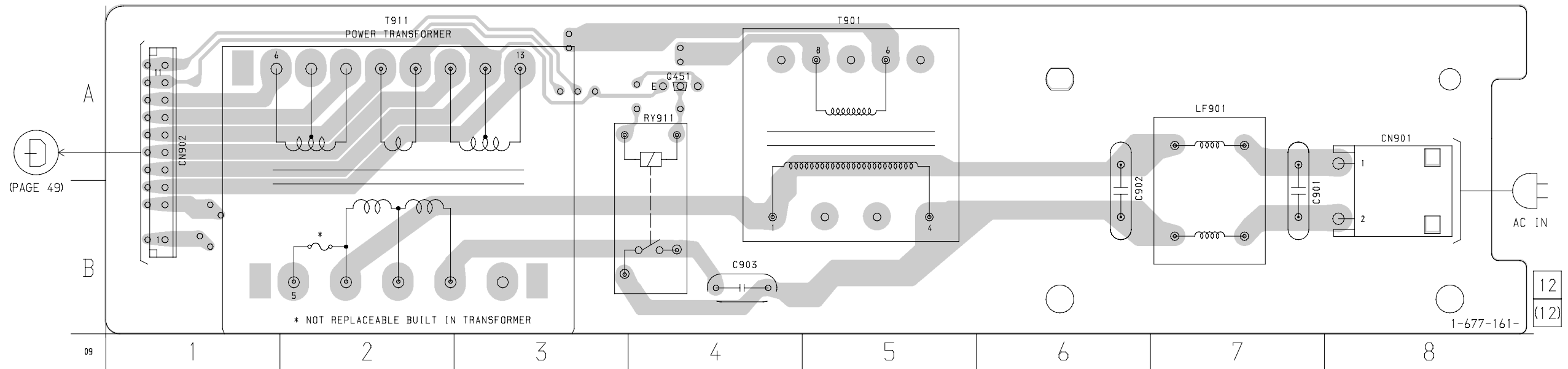
Note: The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

6-11. PRINTED WIRING BOARD – POWER SECTION – • See page 41 for Circuit Board Location.

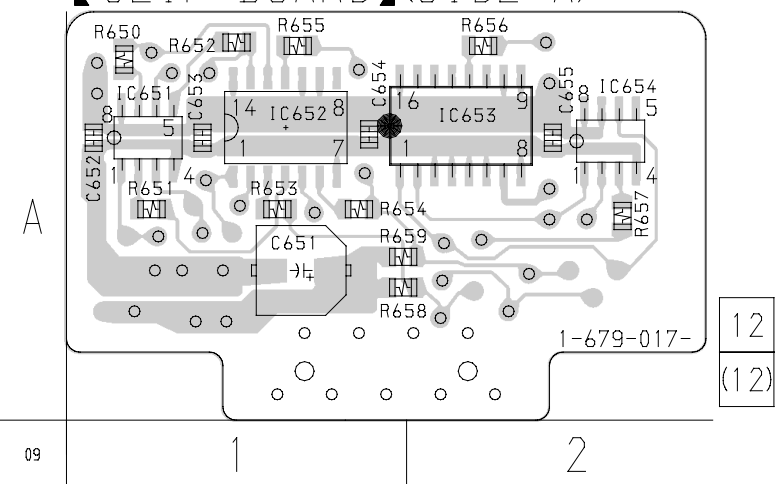
【TRANS BOARD】(SIDE A)



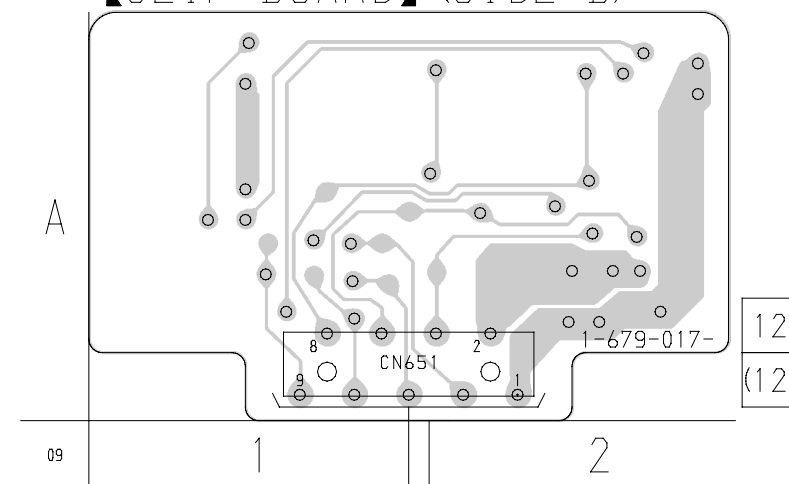
【TRANS BOARD】(SIDE B)



【CLIP BOARD】(SIDE A)



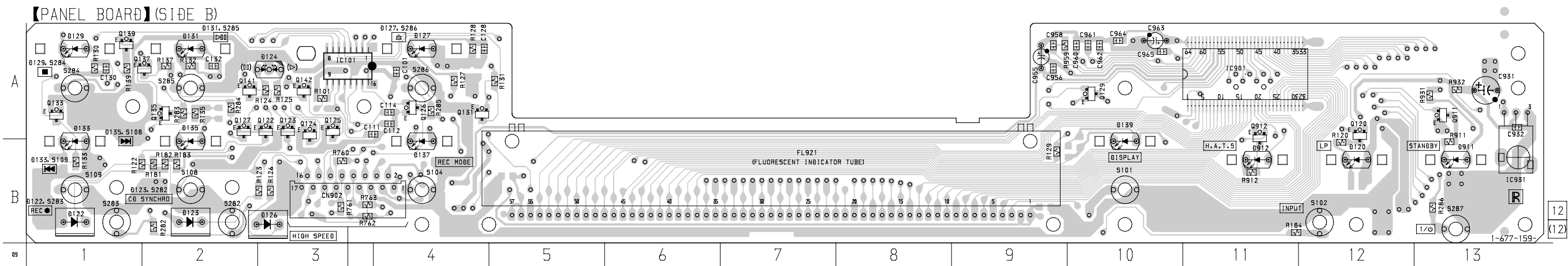
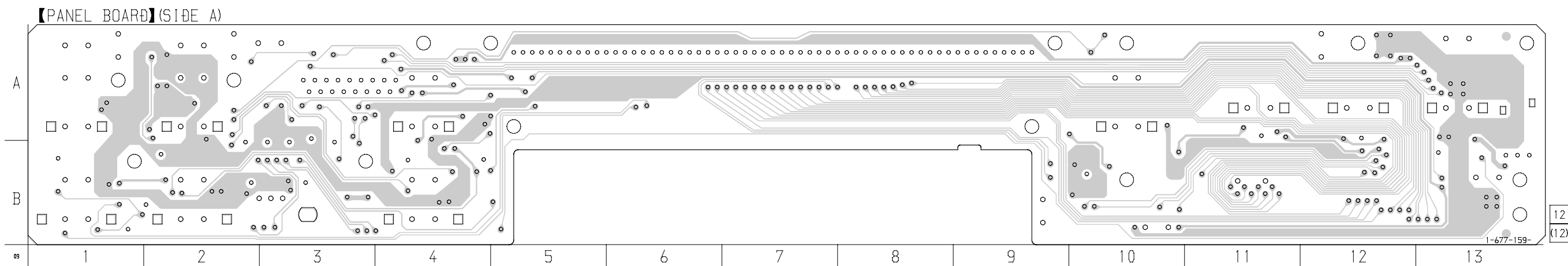
【CLIP BOARD】(SIDE B)



(PAGE 49)

There are a few cases that the part isn't mounted in model is printed on diagram.

6-12. PRINTED WIRING BOARD – PANEL SECTION – • See page 41 for Circuit Board Location.



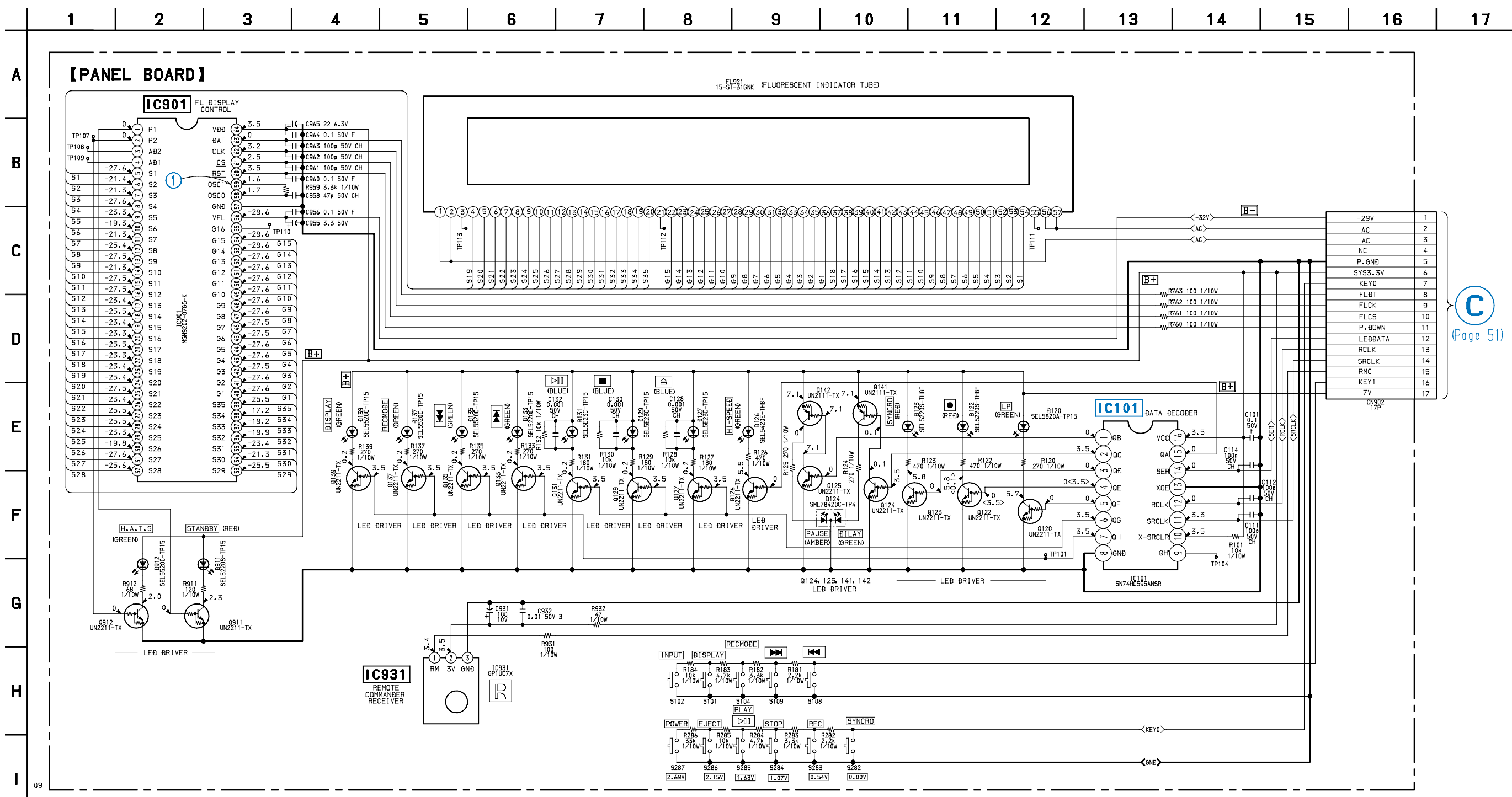
(PAGE 49)

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D120	B-12	Q120	A-12
D122	B-1	Q122	A-3
D123	B-2	Q123	A-3
D124	A-3	Q124	A-3
D126	B-3	Q125	A-3
D127	A-4	Q126	A-4
D129	A-1	Q127	B-2
D131	A-1	Q129	A-10
D133	A-1	Q131	A-4
D135	A-2	Q133	A-1
D137	B-4	Q135	A-2
D139	A-10	Q137	B-1
D911	B-13	Q139	A-1
D912	A-11	Q141	A-2
		Q142	A-3
IC101	A-3	Q911	A-13
IC901	A-11	Q912	A-11
IC931	B-13		

There are a few cases that the part isn't mounted in model is printed on diagram.

6-13. SCHEMATIC DIAGRAM – PANEL SECTION – • See page 44 for Waveforms.



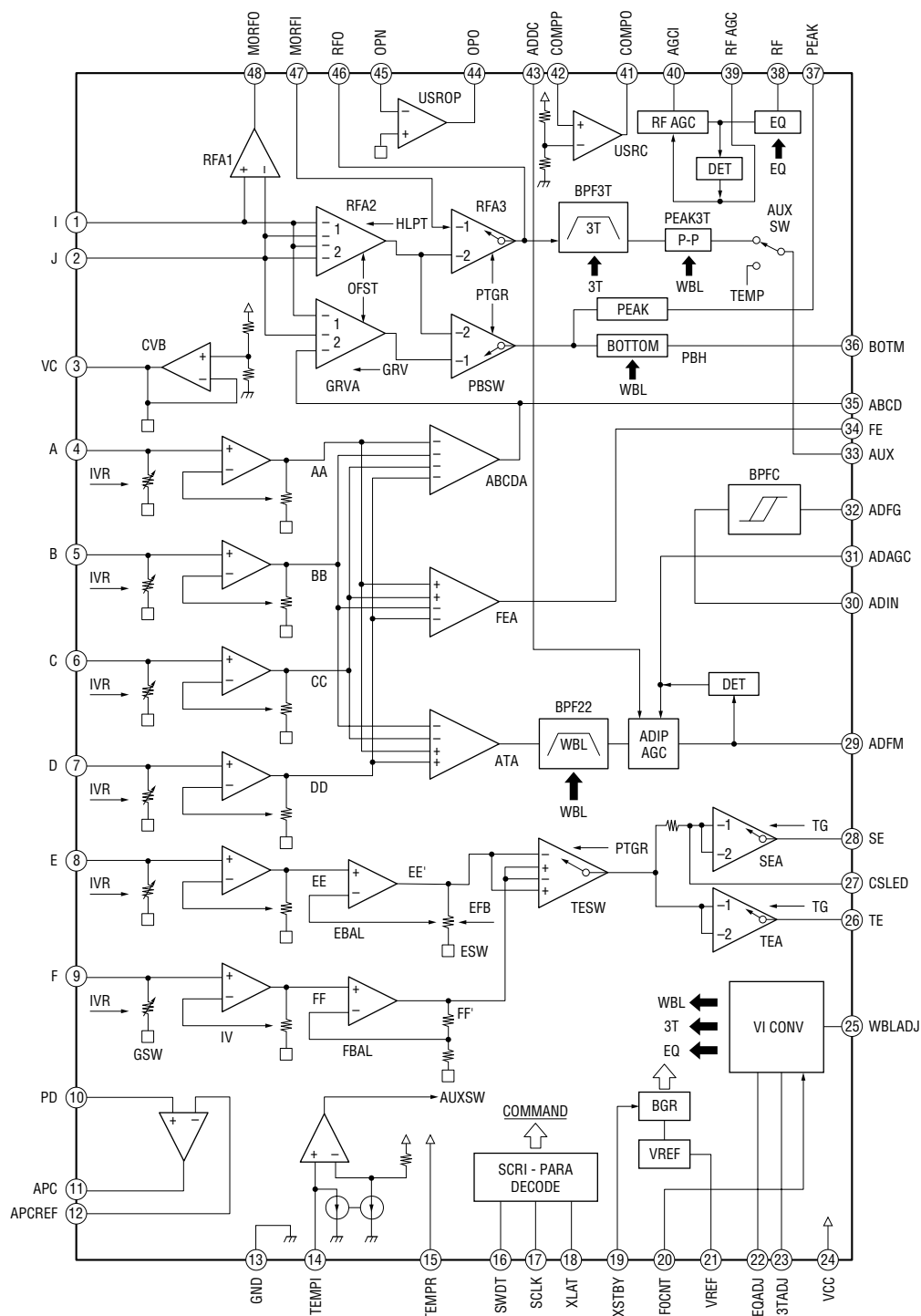
C
(Page 51)

NOTE

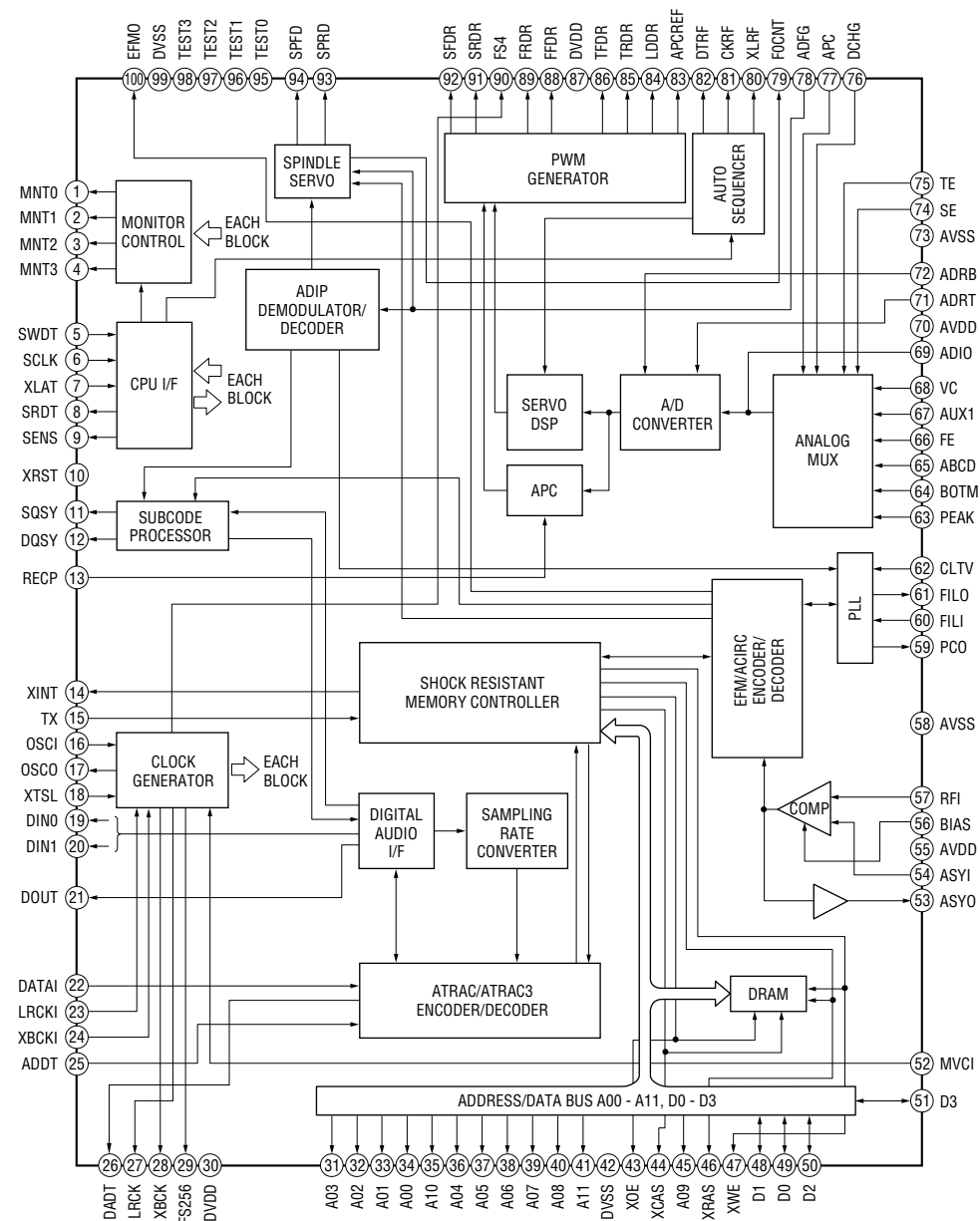
- Voltages and waveforms are dc with respect to ground () :PLAY in service mode.
- no mark:STOP
- < >:REC
- * :can not be measured.

6-14. IC BLOCK DIAGRAMS

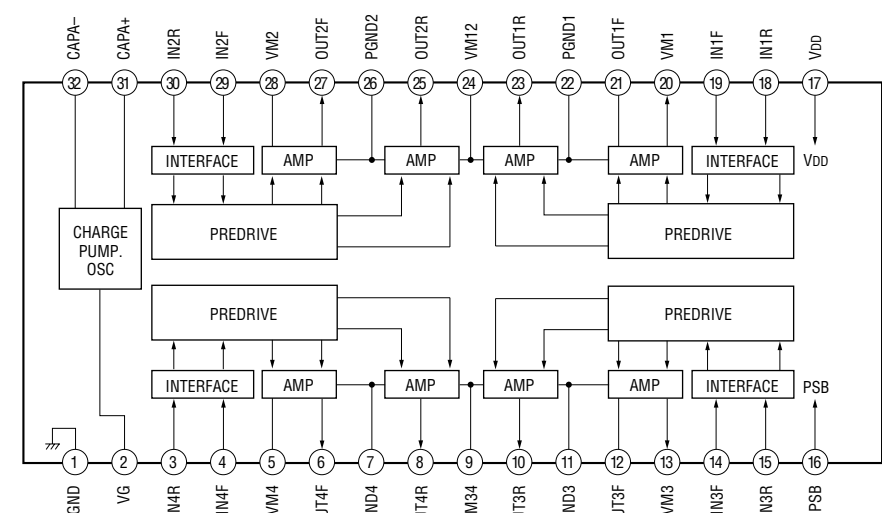
IC101 CXA2523AR (BD BOARD)



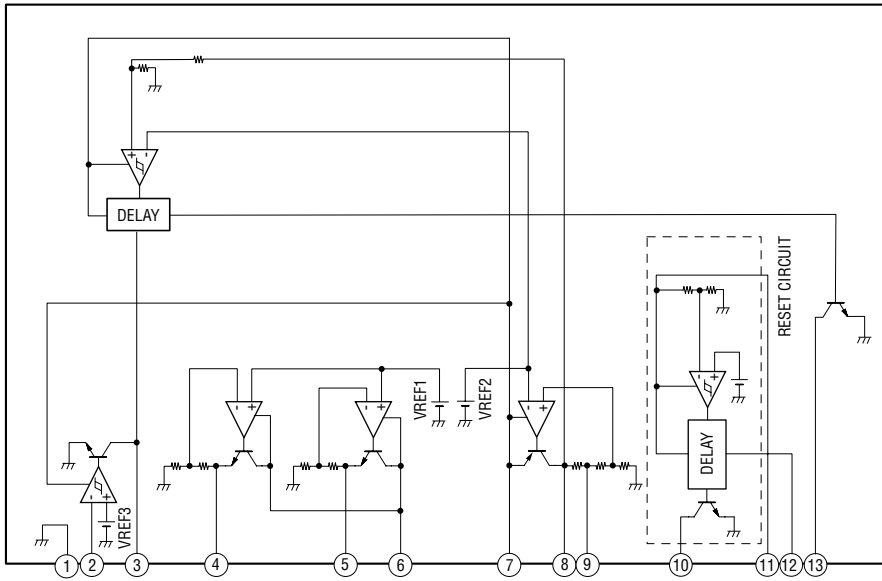
IC151 CXD2662R (BD BOARD)



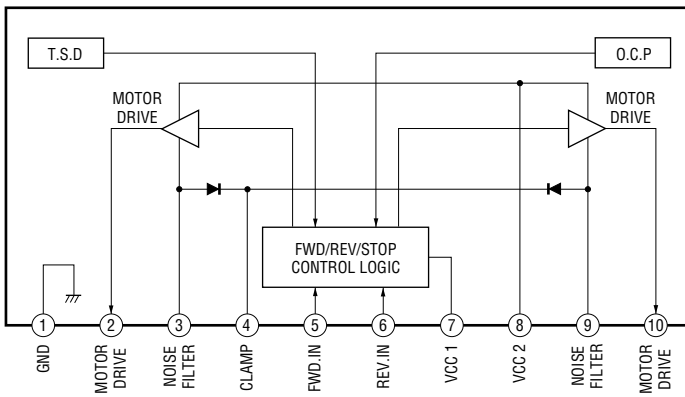
IC141 BH6511FS (BD BOARD)



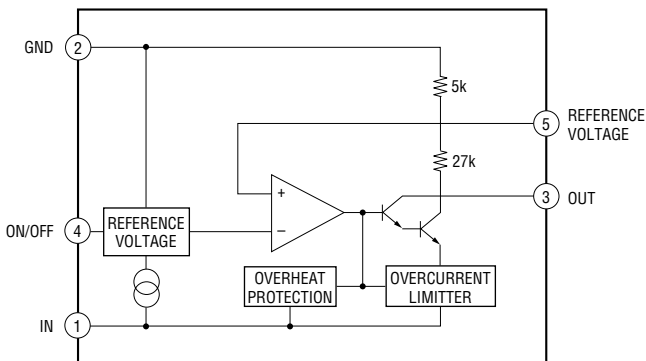
IC101 LA5643 (MAIN BOARD)



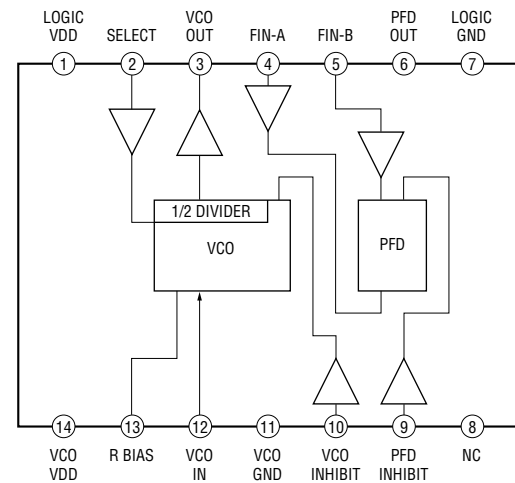
IC801 LB1641 (MAIN BOARD)



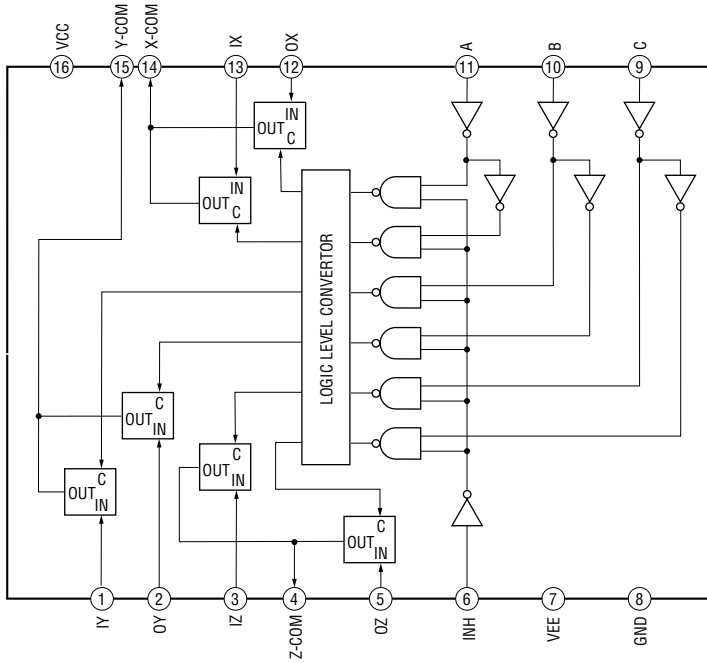
IC431 M5293L (MAIN BOARD)



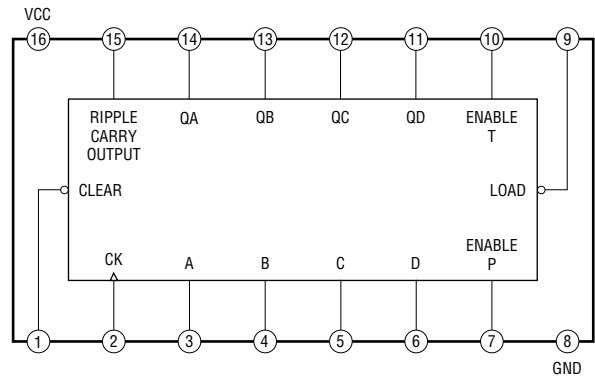
IC602 TLC2932IPW (MAIN BOARD)



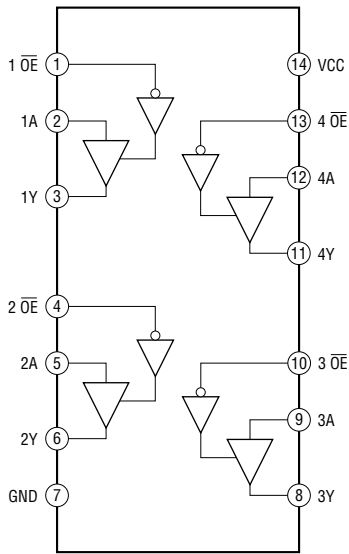
IC656 TC74HC4053F (MAIN BOARD)



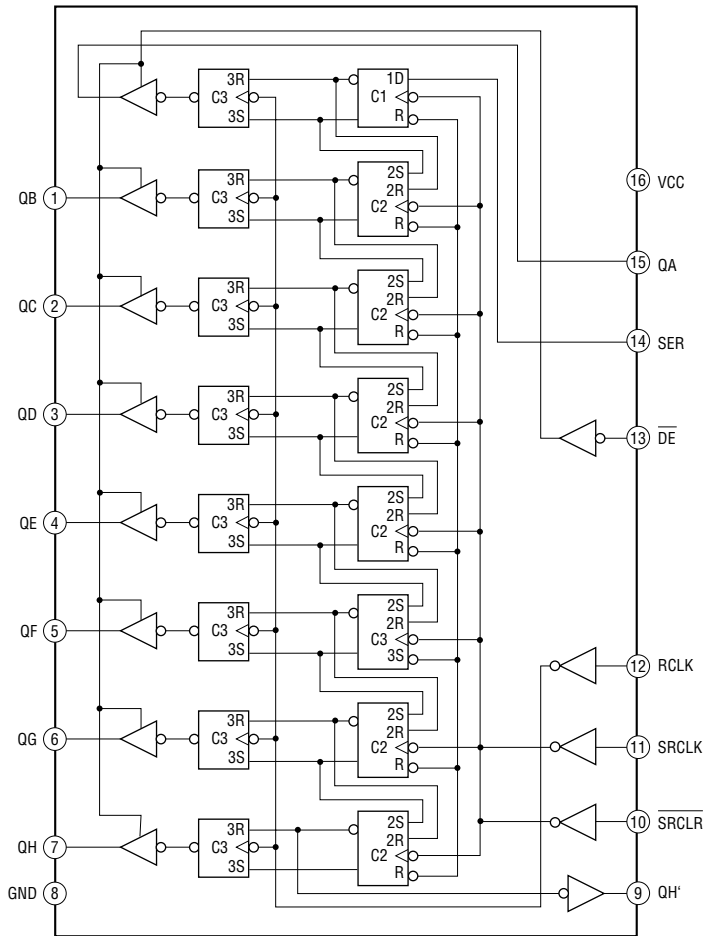
IC653 TC74HC161AF (CLIP BOARD)



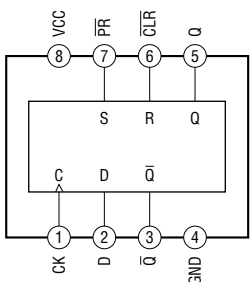
IC652 TC74HC125AF (CLIP BOARD)



IC101 SN74HC595ANSR (PANEL BOARD)



IC654 TC7W74F (CLIP BOARD)



6-15. IC PIN FUNCTIONS

• IC101 CXA2523AR RF Amplifier (BD BOARD)

Pin No.	Pin Name	I/O	Function
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 (+1.5V) generation output
4 to 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 CXD2662R
17	SCLK	I	Serial clock input from the CXD2662R
18	XLAT	I	Latch signal input from the CXD2662R “L”: Latch
19	XSTBY	I	Stand by signal input “L”: Stand by
20	FOCNT	I	Center frequency control voltage input of BPF22, BPF3T, EQ from the CXD2662R
21	VREF	O	Reference voltage output (Not used)
22	EQADJ	I/O	Center frequency setting pin for the internal circuit EQ
23	3TADJ	I/O	Center frequency setting pin for the internal circuit BPF3T
24	Vcc	—	+3V power supply
25	WBLADJ	I/O	Center frequency setting pin for the internal circuit BPF22
26	TE	O	Tracking error signal output to the CXD2662R
27	CSLED	—	External capacitor connection pin for the sled error signal LPF
28	SE	O	Sled error signal output to the CXD2662R
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 CXD2662R
33	AUX	O	I3 signal/temperature signal output to the CXD2662R (Switching with a serial command)
34	FE	O	Focus error signal output to the CXD2662R
35	ABCD	O	Light amount signal output to the CXD2662R
36	BOTM	O	RF/ABCD bottom hold signal output to the CXD2662R
37	PEAK	O	RF/ABCD peak hold signal output to the CXD2662R
38	RF	O	RF equalizer output to the CXD2662R
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	I/O	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

• IC151 CXD2662R Digital Signal Processor, Digital Servo Signal Processor (BD BOARD)

Pin No.	Pin Name	I/O	Function
1	MNT0 (FOK)	O	FOK signal output to the system control (monitor output) “H” is output when focus is on
2	MNT1 (SHCK)	O	Track jump detection signal output to the system control (monitor output)
3	MNT2 (XBUSY)	O	Monitor 2 output to the system control (monitor output)
4	MNT3 (SLOC)	O	Monitor 3 output to the system control (monitor output)
5	SWDT	I	Writing data signal input from the system control
6	SCLK	I (S)	Serial clock signal input from the system control
7	XLAT	I (S)	Serial latch signal input from the system control
8	SRDT	O (3)	Reading data signal output to the system control
9	SENS	O (3)	Internal status (SENSE) output to the system control
10	XRST	I (S)	Reset signal input from the system control “L”: Reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system control “L” is output every 13.3 msec. Almost all, “H” is output
12	DQSY	O	Digital In U-bit CD format or MD format subcode Q sync (SCOR) output to the system control
13	RECP	I	Laser power switching input from the system control “H”: Recording, “L”: Playback
14	XINT	O	Interrupt status output to the system control
15	TX	I	Recording data output enable input from the system control
16	OSCI	I	System clock input (512Fs=22.5792 MHz)
17	OSCO	O	System clock output (512Fs=22.5792 MHz) (Not used)
18	XTSL	I	System clock frequency setting “L”: 45.1584 MHz, “H”: 22.5792 MHz (Fixed at “H”)
19	DIN0	I	Digital audio input (Optical input)
20	DIN1	I	Digital audio input (Optical input)
21	DOUT	O	Digital audio output (Optical output)
22	DADTI	I	Serial data input
23	LRCKI	I	LR clock input “H” : Lch, “L” : R ch
24	XBCKI	I	Serial data clock input
25	ADDT	I	Data input from the A/D converter
26	DADT	O	Data output to the D/A converter
27	LRCK	O	LR clock output for the A/D and D/A converter (44.1 kHz)
28	XBCK	O	Bit clock output to the A/D and D/A converter (2.8224 MHz)
29	FS256	O	11.2896 MHz clock output (Not used)
30	DVDD	—	+3V power supply (Digital)
31 to 34	A03 to A00	O	DRAM address output
35	A10	O	DRAM address output (Not used)
36 to 40	A04 to A08	O	DRAM address output
41	A11	O	DRAM address output (Not used)
42	DVSS	—	Ground (Digital)
43	XOE	O	Output enable output for DRAM
44	XCAS	O	$\overline{\text{CAS}}$ signal output for DRAM
45	A09	O	Address output for DRAM
46	XRAS	O	$\overline{\text{RAS}}$ signal output for DRAM
47	XWE	O	Write enable signal output for DRAM

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

Pin No.	Pin Name	I/O	Function
48	D1	I/O	Data input/output for DRAM
49	D0	I/O	
50, 51	D2, D3	I/O	
52	MVCI	I (S)	Clock input from an external VCO (Fixed at "L")
53	ASYO	O	Playback EFM duplex signal output
54	ASYI	I (A)	Playback EFM comparator slice level input
55	AVDD	—	+3V power supply (Analog)
56	BIAS	I (A)	Playback EFM comparator bias current input
57	RFI	I (A)	Playback EFM RF signal input
58	AVSS	—	Ground (Analog)
59	PCO	O (3)	Phase comparison output for the recording/playback EFM master PLL
60	FILI	I (A)	Filter input for the recording/playback EFM master PLL
61	FILO	O (A)	Filter output for the recording/playback EFM master PLL
62	CLTV	I (A)	Internal VCO control voltage input for the recording/playback EFM master PLL
63	PEAK	I (A)	Light amount signal peak hold input from the CXA2523AR
64	BOTM	I (A)	Light amount signal bottom hold input from the CXA2523AR
65	ABCD	I (A)	Light amount signal input from the CXA2523AR
66	FE	I (A)	Focus error signal input from the CXA2523AR
67	AUX1	I (A)	Auxiliary A/D input
68	VC	I (A)	Middle point voltage (+1.5V) input from the CXA2523AR
69	ADIO	O (A)	Monitor output of the A/D converter input signal (Not used)
70	AVDD	—	+3V power supply (Analog)
71	ADRT	I (A)	A/D converter operational range upper limit voltage input (Fixed at "H")
72	ADRB	I (A)	A/D converter operational range lower limit voltage input (Fixed at "L")
73	AVSS	—	Ground (Analog)
74	SE	I (A)	Sled error signal input from the CXA2523AR
75	TE	I (A)	Tracking error signal input from the CXA2523AR
76	DCHG	I (A)	Connected to +3V power supply
77	APC	I (A)	Error signal input for the laser digital APC (Fixed at "L")
78	ADFG	I (S)	ADIP duplex FM signal input from the CXA2523AR (22.05 ± 1 kHz)
79	F0CNT	O	Filter f ₀ control output to the CXA2523AR
80	XLRF	O	Control latch output to the CXA2523AR
81	CKRF	O	Control clock output to the CXA2523AR
82	DTRF	O	Control data output to the CXA2523AR
83	APCREF	O	Reference PWM output for the laser APC
84	TEST0	O	PWM output for the laser digital APC (Not used)
85	TRDR	O	Tracking servo drive PWM output (-)

- Abbreviation

EFM: Eight to Fourteen Modulation

PLL : Phase Locked Loop

VCO: Voltage Controlled Oscillator

Pin No.	Pin Name	I/O	Function
86	TFDR	O	Tracking servo drive PWM output (+)
87	DVDD	—	+3V power supply (Digital)
88	FFDR	O	Focus servo drive PWM output (+)
89	FRDR	O	Focus servo drive PWM output (-)
90	FS4	O	176.4 kHz clock signal output (X'tal) (Not used)
91	SRDR	O	Sled servo drive PWM output (-)
92	SFDR	O	Sled servo drive PWM output (+)
93	SPRD	O	Spindle servo drive PWM output (-)
94	SPFD	O	Spindle servo drive PWM output (+)
95	FGIN	I (S)	Test input (Fixed at "L")
96 to 98	TEST1 to TEST3	I	
99	DVSS	—	Ground (Digital)
100	EFMO	O	EFM output when recording

- Abbreviation

EFM: Eight to Fourteen Modulation

• IC501 M30805SGP SYSTEM CONTROL (MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	DATA(FL)	O	Serial data signal output to the display driver.
2	CLK(FL)	O	Serial clock signal output to the display driver. L: Active
3	C1ERROR	I	C1 error input. (Fixed at L)
4	RMC/ERROR	I	Remote control input./AD error detect.
5	DQSY (3202)	I	Digital in sync input from the CXD3202AR.
6 to 10	NC	—	Not used.
11	LD-LOW	O	Loading motor voltage control output L: High voltage H: Low voltage
12	LDIN	I	Loading motor control input. H: IN
13	LDOUT	O	Loading motor control output. H: OUT
14	MOD	O	Laser modulation switching signal output. L: OFF H: ON
15	BYTE	I	Data bus changed input. (Connected to ground.)
16	CNVSS	—	Ground.
17	X-CIN	I	Not used.
18	X-COUT	O	Not used.
19	RESET	I	System rest input. L : ON
20	XOUT	O	Main clock output. (10MHz)
21	VSS	—	Ground.
22	XIN	I	Main clock input. (10MHz)
23	VCC0	—	Power supply. (+3.3V)
24	NMI	I	Fixed at H. (Pull-up)
25	DQSY (MDM/INT2)	I	Digital in sync input. (Record system)
26	P.DOWN (INT1)	I	Power down detection input. L: Power down
27	SQSY (ATSY)	I	ADIP (MO) sync or subcode Q (PIT) sync input from CXD2662R.(Playback system)
28	NC	—	Not used.
29	LDON	O	Laser ON/OFF control output. H: Laser ON
30	LIMIT-IN	I	Detection input from the limit switch. L: Sled limit-In H: Sled limit-Out
31	A1 OUT	O	A1 Control output.
32	XINIT	I	Interrupt status input from CXD2662R.
33	CNT1 (CLIP WRITE)	O	Clip write signal output.
34	XELT	I	Data latch input for DSP.
35	WR PWR	O	Write power ON/OFF output. L: OFF H: ON
36	NC	—	Not used.
37	NC	—	Not used.
38	SWDT	O	Writing data signal output to the serial bus.
39	VCC1	—	Power supply. (+3.3V)
40	SRDT	I	Reading data signal input from the serial bus.
41	VSS1	—	Ground.
42	SCLK (DSP/ADDA)	O	Clock signal output to the serial bus.
43	RECP-SW	I	Detection signal input from the recording position detection switch. L: REC
44	TX0 (CLIP DATA)	O	CLIP serial data output.
45	RX0 (CLIP DATA)	I	CLIP serial data input.
46	CLK0 (CLIP CLK)	O	CLIP serial clock output.
47	DIG-RST	O	Digital rest signal output to the CXD2662R and motor driver. L: Reset
48	SENS	I	Internal status (SENSE) input from the CXD2662R.
49	PLAY-SW	I	Detection signal input from the playback position detection switch. L: PLAY
50	XLATCH	O	Latch signal output to the serial bus.
51	OUT-SW	I	Detection signal input from the loading out detection switch.
52	RDY	I	Fixed at H. (Pull-up)
53	ALE/RAS	O	Microprocessor mode output. (Not used.)
54	HOLD	I	Fixed at H. (Pull-up)
55	HLDA	O	Microprocessor mode output. (Not used.)
56	MNT2 (XBUSY)	I	In the state of executive command from the CXD2662R
57	VSS2	—	Ground.

Pin No.	Pin Name	I/O	Function
58	MNT1 (SHCK)	I	Track jump signal input from the CXD2662R
59	VCC2	—	Power supply. (+3.3V)
60	EEP-WP	O	EEP-ROM write protect signal output. L: write possibility
61	SDA (EEP)	I/O	Data signal input/output pin with the EEPROM.
62	BCLK	O	Not used.
63	XRD	O	Read signal output.
64	BHE	O	Not used.
65	XWR	O	Write signal output.
66	SCL (EEP)	O	Clock signal output to the EEPROM.
67	REFLECT-SW	I	Disk reflection rate detection input from the reflect detection switch. H: Disk with low reflection rate
68	PROTECT-SW	I	Recording-protection claw detection input from the protection detection switch. H: Protect
69	CS0 (F-ROM)	O	Chip select signal output to the Flash ROM.
70	CS1 (S-RAM)	O	Not used.
71	CS2	O	
72	A20	O	Address bus signal output to Flash ROM.
73	A19	O	Address bus signal output to Flash ROM.
74	VCC	—	Power supply. (+3.3V)
75	A18	O	Address bus signal output to Flash ROM.
76	VSS	—	Ground
77 to 85	A17 to A9	O	Address bus signal output to Flash ROM.
86 to 89	NC	O	Not used.
90	WP (FLASH)	O	Write protect signal to the Flash ROM.
91	VCC4	—	Power supply. (+3.3V)
92	A8	O	Address bus signal output to Flash ROM.
93	VCC4	—	Power supply. (+3.3V)
94 to 101	A7 to A0	O	Address bus signal output to Flash ROM.
102 to 113	D15 to D4	I/O	Data bus signal input/output to the Flash ROM.
114	NC	—	Not used.
115	NC	—	Not used.
116	NC	—	Not used.
117	TPBIAS	O	Bias on signal output.
118	1394RESET	O	Reset signal output for IEEE1394
119 to 122	D3 to D0	I/O	Data bus signal input/output to the Flash ROM.
123	LED DATA	O	Serial parallel data output for LED.
124	RCLK	O	Serial parallel clock output for LED.
125	CNT2 (CLIP READ)	O	Clip read signal output.
126	SRCK	O	Serial parallel latch output for LED.
127	RST (CLIP)	O	Clip reset signal output.
128	FLCS	O	Chip select signal output to the display driver.
129	CNT3 (RAW AUDIO)	O	RALU audio control signal output.
130	VSS	—	Ground.
131	STB	O	Strobe signal output to the power supply circuit. H: Power supply ON; L: standby
132	VCC	—	Power supply. (+3.3V)
133	OP-LEVEL	I	Optical Pick-up voltage (current) detect signal input.
134	NC	I	Not used.
135 to 138	NC	I	Not used.
139	KEY 1	I	Key input pin (A/D input)
140	AVSS	—	Ground. (Analog)
141	KEY0	I	A/D reference voltage.
142	VREF	—	Power supply. (+3.3V)
143	AVCC	—	Power supply. (+3.3V)
144	NC	I	Not used.

• IC601 CXD3202AR AUDIO LINK(MAIN BOARD)

Pin. No.	Pin Name	I/O	Function
1	VSS	-	Ground.
2	512FSI	I	512 fs input (used for flow control and ATRAC reception)
3	VSS	-	Ground.
4	XREQO/I	I/O	ATRAC data request (Output for transmission, input for reception)
5	ADTI	I	ATRAC transmission data input
6	XLATI	I	ATRAC transmission data latch signal
7	ACKI	I	ATRAC transmission clock
8	VSS	-	Ground.
9	ADTO	O	ATRAC reception data
10	XLATO	O	ATRAC reception data latch signal
11	ACKO	O	ATRAC reception clock
12	VDD	-	Power supply.
13	BCKI	I	Raw audio transmission bit clock
14	LRCKI	I	Raw audio transmission L/R clock (fs)
15	DATAI	I	Raw audio transmission data
16	VSS	-	Ground.
17	DIN	I	IEC958 bi-phase data input
18	DOUT	O	IEC958 bi-phase data output
19	VDD	-	Power supply.
20	BCKO	O	Raw audio reception bit clock
21	LRCKO	O	Raw audio reception L/R clock (fs)
22	DATAO	O	Raw audio reception data output
23	EOF	O	Raw audio reception data error flag
24	VSS	-	Ground.
25	1/8OUT	O	Split PLL clock (256 fs) and output 1/8 fs (used for PLL Ref)
26	SYTO	O	Clock information transmitted from transmitting side (1/8 fs)
27	PLLCKI	-	256 fs clock created from transmitted SYT
28	VDD	-	Power supply.
29	256FSO	-	Same as PLLCKI clock
30	VSS	-	Ground.
31	TRST	-	Fix test pin at left on board. (Conected to ground.)
32	TCK	-	Fix test pin at left on board. (Conected to ground.)
33	TDI	-	Test pin on board open
34	TENAI	-	Test pin on board open
35	TD0	-	Test pin on board open
36	VST	-	Conected to ground.
37	VSS	-	Ground.
38	DATA15	I/O	Host interface data bus (Bit 15)
39	DATA14	I/O	Host interface data bus (Bit 14)
40	DATA13	I/O	Host interface data bus (Bit 13)
41	DATA12	I/O	Host interface data bus (Bit 12)
42	DATA11	I/O	Host interface data bus (Bit 11)
43	DATA10	I/O	Host interface data bus (Bit 10)
44	DATA9	I/O	Host interface data bus (Bit 9)
45	DATA8	I/O	Host interface data bus (Bit 8)
46	VDD	-	Power supply.
47	DATA7	I/O	Host interface data bus (Bit 7)
48	DATA6	I/O	Host interface data bus (Bit 6)
49	DATA5	I/O	Host interface data bus (Bit 5)
50	DATA4	I/O	Host interface data bus (Bit 4)
51	DATA3	I/O	Host interface data bus (Bit 3)
52	DATA2	I/O	Host interface data bus (Bit 2)
53	DATA1	I/O	Host interface data bus (Bit 1)
54	DATA0	I/O	Host interface data bus (Bit 0)

Pin. No.	Pin Name	I/O	Function
55	VSS	-	Ground.
56	XINT	O	Interrupt signal transmitted to host. (Not used.)
57	XCS	I	Chip select signal from host
58	XWR	I	Write signal from host
59	XRD	I	Read signal from host
60	ALE	I	Address latch signal from host (enabled for M16); Fixed at "H" for Intel
61	XRDY	O	Ready signal transmitted to host (L = Ready)
62	VDD	-	Power supply.
63 to 70	A0 to 7	I	Address bit 0 (when Intel host interface is used)
71	VSS	-	Ground.
72	INTL/XM16	I	Type of host to which connection is to be established. (L = M16; H = Intel)
73	VSS	-	Ground.
74	D3	I/O	PHY interface data bus bit 3.
75	D2	I/O	PHY interface data bus bit 2.
76	D1	I/O	PHY interface data bus bit 1.
77	D0	I/O	PHY interface data bus bit 0.
78	VSS	-	Ground.
79	CTL1	I/O	PHY interface control bus bit 1
80	CTL0	I/O	PHY interface control bus bit 0
81	LREQ	O	PHY interface request signal
82	VDD	-	Power supply.
83	SYSCLK	I	PHY interface system clock (49.152 MHz)
84	VSS	-	Ground.
85	XRESET	I	System reset
86 to 94	TS0 to 8	O	Test output. (Not used.)
95	VDD	-	Power supply.
96	HCLKOUT	O	Clock obtained by splitting SYSCLK (24.576 MHz) (Not used.)
97	GNCLK	O	Clock obtained by dividing NCLK in two (6.144 MHz) (Not used.)
98	TS9	O	Test output. (Not used.)
99	DQSY	O	Ubit reception frame pulse
100	C2PO	I	CD C2 error input. (Connected to ground.)
101	SBSO	I	CD SubCode data. (Connected to ground.)
102	EXCK	O	CD SubCode read clock. (Not used.)
103	WFCK	I	SubCode frame signal. (Connected to ground.)
104	SCOR	I	CD SubCode frame lead signal. (Connected to ground.)
105	TS16	O	"8-bit clock synchronized to 512 fsin (Output at address 30, bit 4 = 1) (Not used.)"
106	TS17	O	"L/R clock synchronized to 512 fsin(Output at address 30, bit 4 = 1) (Not used.)"
107	TS18	O	DRAM address bit 11. (Not used.)
108	VSS	-	Ground.
109	VDD	-	Power supply.
110	A10/TS32	O	DRAM address bit 10. (Not used.)
111	A9/TS31	O	DRAM address bit 9. (Not used.)
112	A8/TS30	O	DRAM address bit 8. (Not used.)
113	A7/TS29	O	DRAM address bit 7. (Not used.)
114	A6/TS28	O	DRAM address bit 6. (Not used.)
115	A5/TS27	O	DRAM address bit 5. (Not used.)
116	VSS	-	Ground.
117	A4/TS26	O	DRAM address bit 4. (Not used.)
118	A3/TS25	O	DRAM address bit 3. (Not used.)
119	A2/TS24	O	DRAM address bit 2. (Not used.)
120	A1/TS23	O	DRAM address bit 1. (Not used.)
121	A0/TS22	O	DRAM address bit 0. (Not used.)
122	XRAS/TS21	O	DRAM XRAS. (Not used.)

Pin. No.	Pin Name	I/O	Function
123	XCAS/TS20	O	DRAM XCAS. (Not used.)
124	XOE/TS19	O	DRAM XOE. (Not used.)
125	XWE	O	DRAM XWE. (Not used.)
126	VSS	-	Ground.
127 to 134	DT15 to 8	I/O	DRAM data bit 15 to 8. (Not used.)
135	VDD	-	Power supply.
136 to 143	DT7 to 0	I/O	DRAM data bit 7 to 0. (Not used.)
144	VSS	-	Ground.

• IC701 CXD1945R PHY, I LINK I/F(MAIN BOARD)

Pin. No.	Pin Name	I/O	Function
1	PC1	I	Connected to ground.
2	PC2	I	Connected to ground.
3	DVSS	-	Ground.
4	DVSS	-	Ground.
5	LPS	I	Link power status. Indicates whether link power is off or on. L: OFF H: ON
6	LREQ	I	Link request. Link issues a PHY register read, write, or bus request through LREQ pin.
7	DVDD	-	Power supply.
8	SCLK	O	49.152 MHz link system clock.PHY-Link interface and cable interface synchronized with SCLK.
9	DVSS	-	Ground.
10	CTL0	I/O	PHY-Link interface control signals.
11	CTL1	I/O	PHY-Link interface control signals.
12	DVDD	-	Power supply.
13	DATA0	I/O	PHY-Link interface data signals.
14	DATA1	I/O	PHY-Link interface data signals.
15	DVSS	-	Ground.
16	DATA2	I/O	PHY-Link interface data signals.
17	DATA3	I/O	PHY-Link interface data signals.
18	DVDD	-	Power supply.
19	DVSS	-	Ground.
20	DVSS	-	Ground.
21	DVSS	-	Ground.
22	DVSS	-	Ground.
23	DVSS	-	Ground.
24	DVSS	-	Ground.
25	DVDD	-	Power supply.
26	DVDD	-	Power supply.
27	DVSS	-	Ground.
28	PURB	I	Power-up reset external condensor pin.
29	AVDD	-	Analog power supply.
30	AVSS	-	Analog ground.
31	AVDD	-	Analog power supply.
32	XO	O	Crystal connection. Crystal oscillator connecting pins.
33	XI	I	Crystal connection. Crystal oscillator connecting pins.
34	AVSS	-	Analog ground.
35	AVSS	-	Analog ground.
36	AVSS	-	Analog ground.
37	AVDD	-	Analog power supply.
38	LF	O	External loop filter connection pin.
39	VCOR	I	External loop filter connection pin.
40	AVSS	-	Analog ground.
41	VREF	I	External base resistance connection pin.
42	REXT	I	External base resistance connection pin.
43	CPS	I	Cable power status detection pin.
44	AVSS	-	Analog ground.
45	AVDD	-	Analog power supply.
46 to 48	TBIAS2 to 0	O	Cable bias output pins.
49	TB2N	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins.
50	TB2P	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins.
51	TA2N	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Standard-phase I/O pins.
52	TA2P	I/O	Arbitration / strobe output; arbitration / speed signal / data input. Reverse-phase I/O pins.
53	TB1N	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins. (Connected to ground.)
54	TB1P	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins. (Connected to ground.)
55	TA1N	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Standard-phase I/O pins.

Pin. No.	Pin Name	I/O	Function
56	TA1P	I/O	Arbitration / strobe output; arbitration / speed signal / data input. Reverse-phase I/O pins.
57	TBON	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins.
58	TB0P	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Reverse-phase I/O pins.
59	TA0N	I/O	Arbitration / speed signal / data output; arbitration / strobe input. Standard-phase I/O pins.
60	TAOP	I/O	Arbitration / strobe output; arbitration / speed signal / data input. Reverse-phase I/O pins.
61	NC	-	Connected to ground.
62	NC	-	Connected to ground.
63	DVDD	-	Power supply.
64	NC	-	Connected to ground.
65	NC	-	Connected to ground.
66	DVSS	-	Ground.
67	DVSS	-	Ground.
68	DVSS	-	Ground.
69	DVSS	-	Ground.
70	DVSS	-	Ground.
71	DVSS	-	Ground.
72	AVSS	-	Analog ground.
73	AVDD	-	Analog power supply.
74	DVSS	-	Ground.
75	TEST1	I	Test mode control pins. Connect to DvDD.
76	TEST0	I	Test mode control pins. Connect to DvDD.
77	DIRECT	I	PHY-Link interface operating mode setting pin. Connect to DvDD.
78	LINK_ON	I/O	Configuration Manager Capable setting pin / Link-On signal output.
79	PC0	I	Connected to ground.
80	DVDD	-	Power supply.

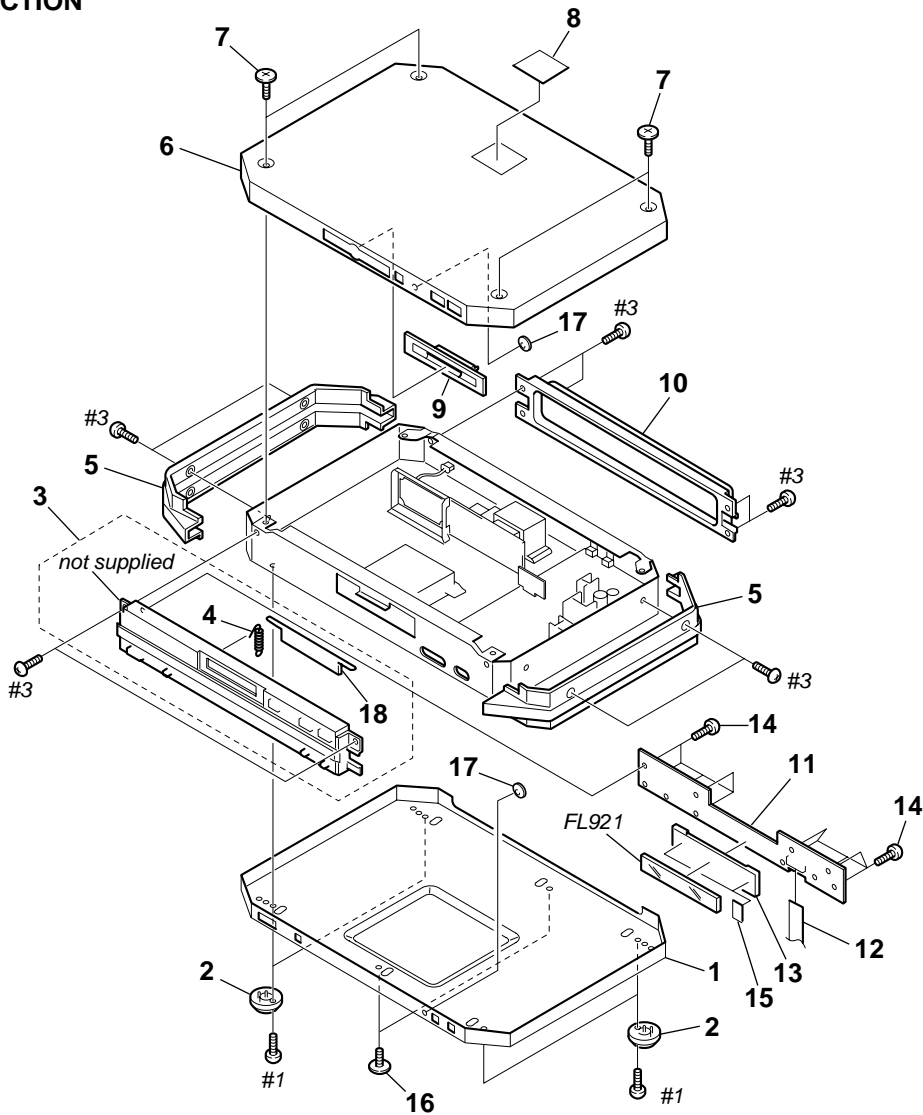
SECTION 7 EXPLODED VIEWS

NOTE:

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

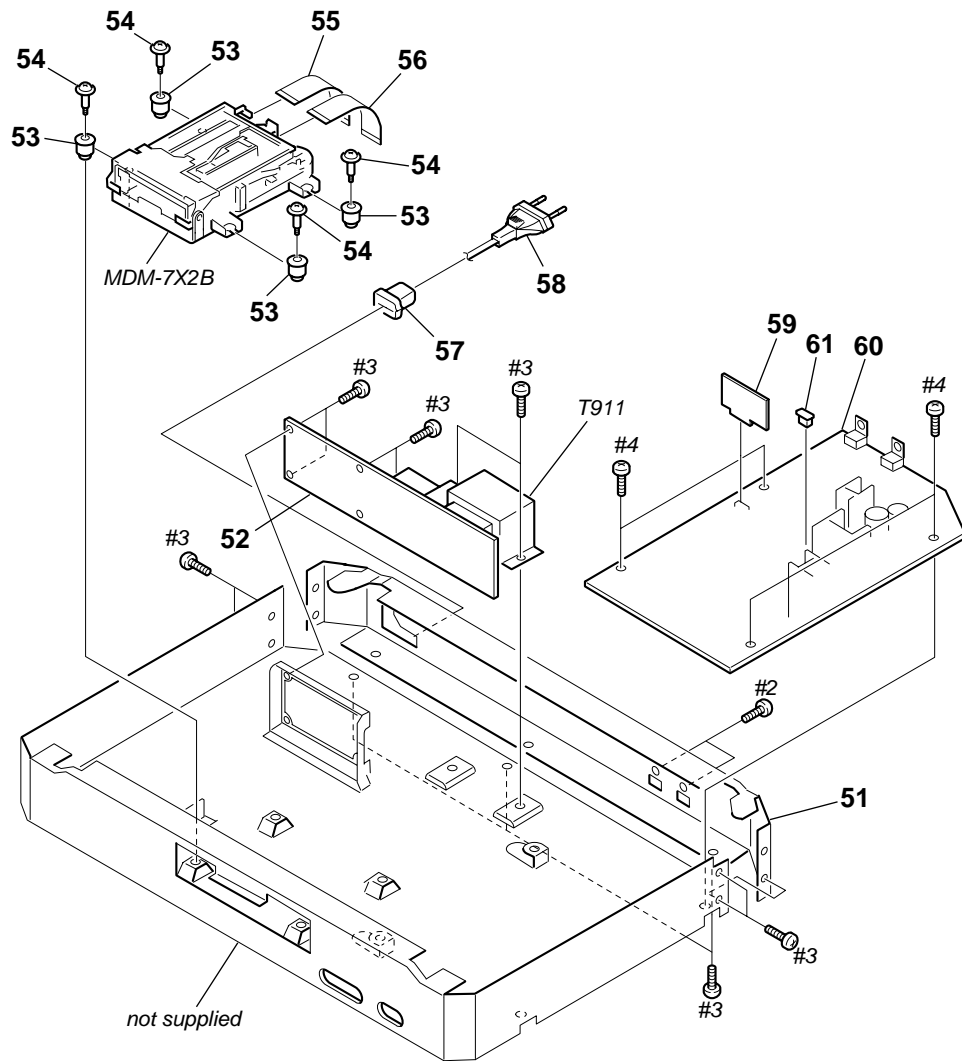
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

7-1. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	4-225-935-01	CASE (BOTTOM)		11	A-4725-068-A	PANEL BOARD, COMPLETE	
2	X-4952-510-1	FOOT ASSY		12	1-773-037-11	WIRE (FLAT TYPE) (17 CORE)	
3	X-4953-081-1	BASE (FRONT) ASSY, PANEL		13	4-225-908-01	HOLDER (FL)	
4	4-228-630-11	SPRING (LID), TENSION COIL		14	4-951-620-01	SCREW (2.6X8), +BVTP	
5	4-225-904-01	BASE (SIDE), PANEL		15	4-225-921-01	CUSHION (FL)	
6	4-225-934-01	CASE (TOP)		16	4-227-843-01	SCREW (TP), FLAT HEAD	
7	4-225-926-01	SCREW (CASE)		17	4-225-917-01	INDICATOR	
8	4-225-919-01	EMBLEM (LISSA)		18	4-230-848-31	LID (MD)	
9	4-225-944-01	ESCUTCHEON (MD)		FL921	1-517-888-11	INDICATOR TUBE, FLUORESCENT	
10	4-225-905-01	BASE (BACK), PANEL					

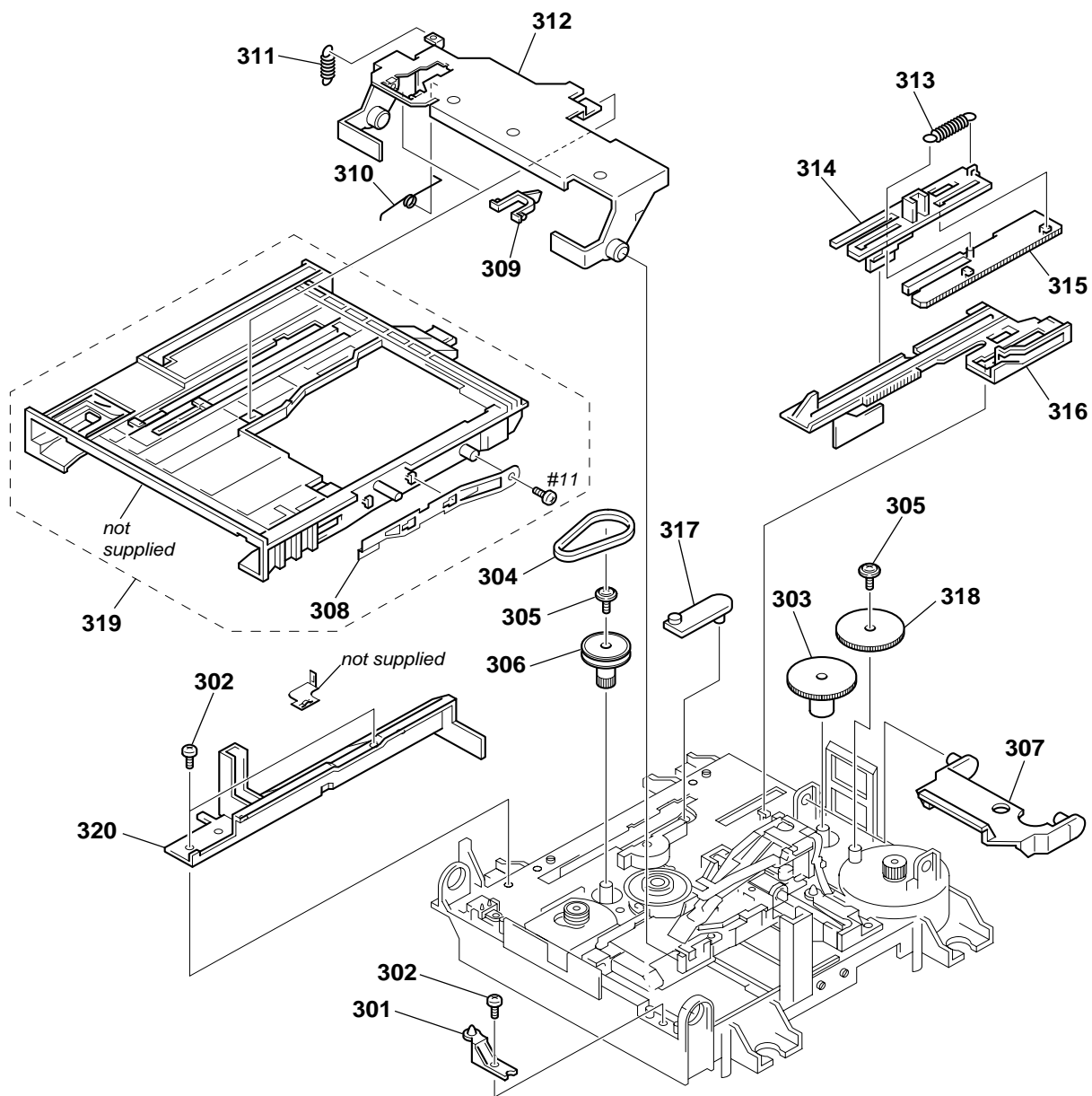
7-2. FRONT PANEL SECTION



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

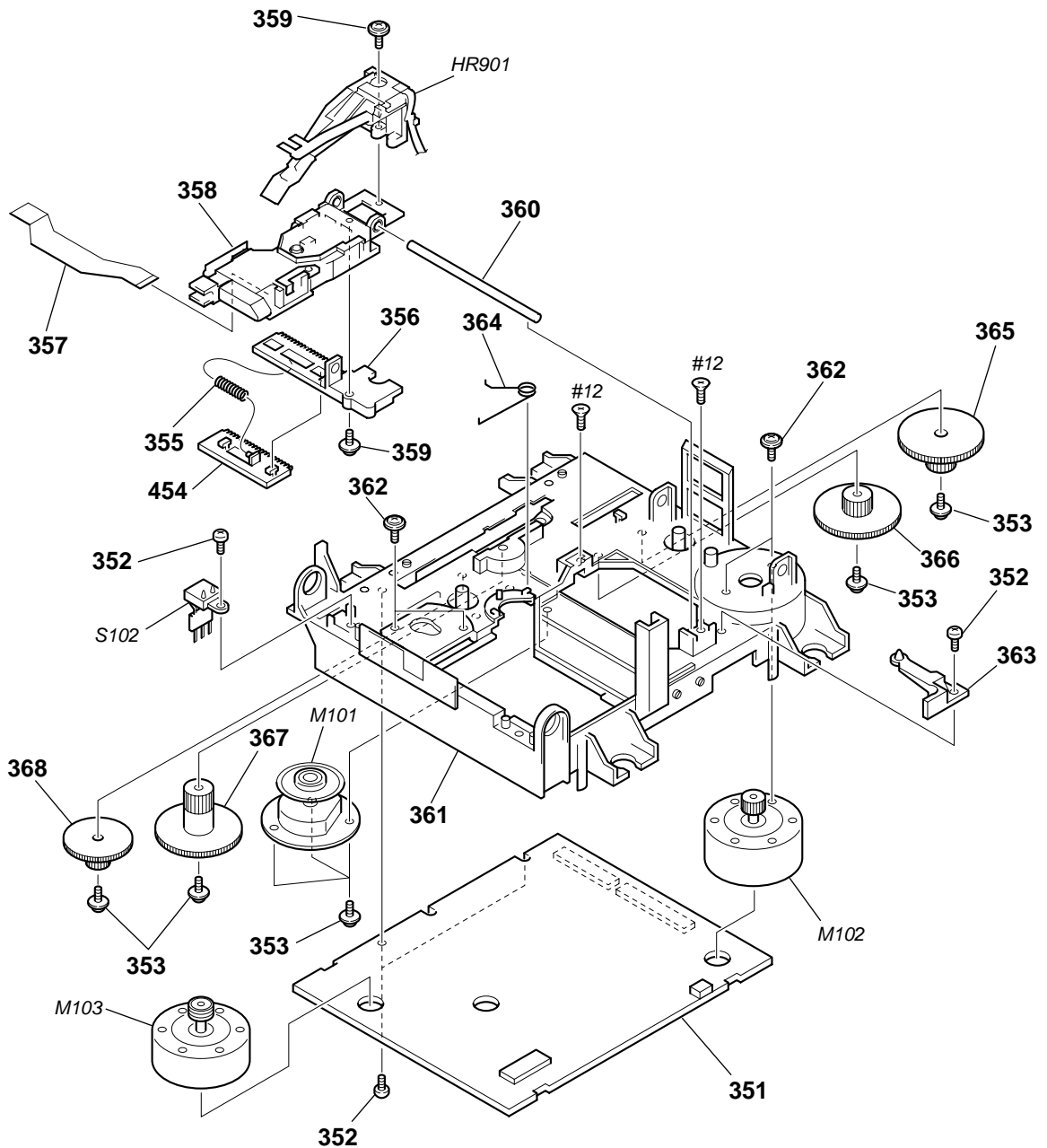
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	4-225-902-11	PANEL, BACK		57	3-703-244-11	BUSHING (2104), CORD	
52	1-677-161-11	TRANS BOARD		Δ 58	1-782-603-11	CORD, POWER	
53	4-228-689-01	INSULATOR		59	1-679-017-11	CLIP BOARD	
54	4-228-643-01	SCREW (+BVTTWH M3), STEP		60	A-4725-065-A	MAIN BOARD, COMPLETE	
55	1-792-441-11	WIRE (FLAT TYPE) (23 CORE)		61	1-569-972-21	SOCKET, SHORT 2P	
56	1-792-442-11	WIRE (FLAT TYPE) (27 CORE)		Δ T911	1-435-398-11	TRANSFORMER, POWER	

**7-3. MECHANISM SECTION-1
(MDM-7X2B)**



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
* 301	4-996-267-01	BASE (BU-D)		311	4-227-012-01	SPRING (HOLDER), TENSION	
302	4-908-618-21	SCREW (+BTP) (2X6)		312	4-227-019-02	PLATE (HOLDER), RETAINER	
303	4-227-007-01	GEAR (SB)		313	4-227-013-01	SPRING (EJ), TENSION	
304	4-227-025-01	BELT (LOADING)		314	4-226-995-01	SLIDER (EJ)	
305	3-372-761-01	SCREW (M1.7), TAPPING		315	4-226-996-01	LIMITTER (EJ)	
306	4-227-002-01	GEAR, PULLEY		316	4-226-997-01	SLIDER	
307	4-226-999-01	LEVER (HEAD)		317	4-226-998-01	LEVER (CHG)	
308	X-4952-665-1	SPRING (SHT) ASSY, LEAF		318	4-227-006-01	GEAR (SA)	
309	4-228-923-01	LOCK (HOLDER)		319	A-4673-973-A	HOLDER ASSY	
310	4-229-533-02	SPRING (STOPPER), TORSION		320	4-226-994-01	GUIDE (L)	

**7-4. MECHANISM SECTION-2
(MDM-7X2B)**



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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
351	A-4725-099-A	BD BOARD, COMPLETE		363	4-226-990-01	BASE (BU-A)	
352	4-908-618-21	SCREW (+BTP) (2X6)		364	4-230-716-01	SPRING (SPDL), TORSION	
353	3-372-761-01	SCREW (M1.7), TAPPING		365	4-227-004-01	GEAR (LC)	
354	4-226-993-01	RACK		366	4-227-005-01	GEAR (LD)	
355	4-227-014-01	SPRING (RACK), COMPRESSION		367	4-227-009-01	GEAR (SD)	
356	4-226-992-01	BASE, SL		368	4-227-008-01	GEAR (SC)	
357	1-678-514-11	FLEXIBLE BOARD		HR901	1-500-670-11	HEAD, OVER LIGHT	
Δ 358	A-4672-976-A	OPTICAL PICK-UP KMS-262A/J1N		M101	A-4735-029-A	MOTOR ASSY, SPINDLE	
359	4-988-560-01	SCREW (+P 1.7X6)		M102	A-4672-900-A	MOTOR ASSY, SLED	
360	4-996-265-01	SHAFT, MAIN		M103	A-4672-975-A	MOTOR ASSY, LOADING	
361	4-226-989-01	CHASSIS		S102	1-771-957-11	SWITCH, PUSH (2 KEY)	
362	4-211-036-01	SCREW (1.7X2.5), +PWH					(REFLECT/PROTECT SW)

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: μ F
- RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

- COILS
uH: μ H
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A... , uPA... , μ PA... ,
uPB... , μ PB... , uPC... , μ PC... ,
uPD... , μ PD...

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

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	A-4725-099-A	BD BOARD, COMPLETE *****					
		< CAPACITOR >					
C101	1-135-259-11	TANTAL. CHIP	10uF 20% 6.3V	C158	1-162-927-11	CERAMIC CHIP	100PF 5% 50V
C102	1-135-259-11	TANTAL. CHIP	10uF 20% 6.3V	C159	1-162-927-11	CERAMIC CHIP	100PF 5% 50V
C103	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	C160	1-162-927-11	CERAMIC CHIP	100PF 5% 50V
C104	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V	C161	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C105	1-115-416-11	CERAMIC CHIP	1000PF 5% 25V	C162	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C106	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	C163	1-125-891-11	CERAMIC CHIP	0.47uF 10% 10V
C107	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	C164	1-162-927-11	CERAMIC CHIP	100PF 5% 50V
C108	1-162-969-11	CERAMIC CHIP	0.0068uF 10% 25V	C165	1-162-966-11	CERAMIC CHIP	0.0022uF 10% 50V
C109	1-164-677-11	CERAMIC CHIP	0.033uF 10% 16V	C166	1-125-891-11	CERAMIC CHIP	0.47uF 10% 10V
C110	1-163-038-11	CERAMIC CHIP	0.1uF 25V	C167	1-164-245-11	CERAMIC CHIP	0.015uF 10% 25V
C111	1-117-720-11	CERAMIC CHIP	4.7uF 10V	C169	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C112	1-110-563-11	CERAMIC CHIP	0.068uF 10% 16V	C173	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C113	1-162-968-11	CERAMIC CHIP	0.0047uF 10% 50V	C174	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C114	1-125-837-91	CERAMIC CHIP	1uF 10% 6.3V	C180	1-117-370-11	CERAMIC CHIP	10uF 10V
C115	1-162-966-11	CERAMIC CHIP	0.0022uF 10% 50V	C181	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C116	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V	C182	1-163-038-11	CERAMIC CHIP	0.1uF 25V
C117	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	C183	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C118	1-165-176-11	CERAMIC CHIP	0.047uF 10% 16V	C184	1-117-970-11	ELECT CHIP	22uF 20% 10V
C119	1-165-176-11	CERAMIC CHIP	0.047uF 10% 16V	C185	1-128-795-91	ELECT CHIP	470PF 10% 630V
C120	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C191	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C121	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C192	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C125	1-117-720-11	CERAMIC CHIP	4.7uF 10V	C193	1-126-206-11	ELECT CHIP	100uF 20% 6.3V
C128	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C194	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C131	1-117-720-11	CERAMIC CHIP	4.7uF 10V	C195	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C132	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C196	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C133	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C1401	1-117-720-11	CERAMIC CHIP	4.7uF 10V
C141	1-126-206-11	ELECT CHIP	100uF 20% 6.3V			< CONNECTOR >	
C142	1-164-156-11	CERAMIC CHIP	0.1uF 25V	CN101	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P	
C143	1-164-156-11	CERAMIC CHIP	0.1uF 25V	CN102	1-784-835-21	CONNECTOR, FFC(LIF(NON-ZIF))27P	
C144	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	CN103	1-784-834-21	CONNECTOR, FFC(LIF(NON-ZIF))23P	
C145	1-164-156-11	CERAMIC CHIP	0.1uF 25V	* CN104	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
C146	1-117-720-11	CERAMIC CHIP	4.7uF 10V	CN105	1-784-859-21	CONNECTOR, FFC(LIF(NON-ZIF))7P	
C147	1-117-720-11	CERAMIC CHIP	4.7uF 10V			< DIODE >	
C151	1-117-370-11	CERAMIC CHIP	10uF 10V	D101	8-719-988-61	DIODE 1SS355TE-17	
C152	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D181	8-719-046-86	DIODE F1J6TP	
C153	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D183	8-719-046-86	DIODE F1J6TP	
C154	1-126-206-11	ELECT CHIP	100uF 20% 6.3V			< IC >	
C155	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC101	8-752-080-95	IC CXA2523AR	
C156	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC102	8-759-473-51	IC TLV2361CDBV	
C157	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC141	8-759-430-25	IC BH6511FS-E2	
				IC151	8-752-404-64	IC CXD2662R	
				IC152	8-759-599-51	IC MSM51V17400D-50TS-K	

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
IC181	8-759-481-17	IC MC74ACT08DTR2		R113	1-216-833-11	METAL CHIP 10K	5% 1/16W
IC190	8-759-677-64	IC L88M35T		R114	1-216-827-11	METAL CHIP 3.3K	5% 1/16W
* IC195	8-759-640-41	IC BR24C08F-E2		R115	1-216-833-11	METAL CHIP 10K	5% 1/16W
< JUMPER RESISTOR >							
JW201	1-216-295-11	SHORT	0	R116	1-216-839-11	METAL CHIP 33K	5% 1/16W
JW202	1-216-295-11	SHORT	0	R117	1-216-837-11	METAL CHIP 22K	5% 1/16W
JW203	1-216-295-11	SHORT	0	R118	1-218-855-11	METAL CHIP 2.2K	0.5% 1/16W
JW903	1-216-295-11	SHORT	0	R119	1-218-863-11	METAL CHIP 4.7K	0.5% 1/16W
JW904	1-216-295-11	SHORT	0	R120	1-218-889-11	METAL CHIP 56K	0.5% 1/16W
< COIL >							
L101	1-500-245-11	INDUCTOR CHIP	0uH	R121	1-218-863-11	METAL CHIP 4.7K	0.5% 1/16W
L102	1-500-245-11	INDUCTOR CHIP	0uH	R122	1-218-855-11	METAL CHIP 2.2K	0.5% 1/16W
L103	1-500-245-11	INDUCTOR CHIP	0uH	R123	1-216-819-11	METAL CHIP 680	5% 1/16W
L105	1-414-235-22	INDUCTOR CHIP	0uH	R124	1-216-809-11	METAL CHIP 100	5% 1/16W
L106	1-500-245-11	INDUCTOR CHIP	0uH	R125	1-216-815-11	METAL CHIP 330	5% 1/16W
L121	1-500-245-11	INDUCTOR CHIP	0uH	R126	1-216-819-11	METAL CHIP 680	5% 1/16W
L122	1-500-245-11	INDUCTOR CHIP	0uH	R127	1-216-845-11	METAL CHIP 100K	5% 1/16W
L131	1-500-245-11	INDUCTOR CHIP	0uH	R128	1-219-724-11	METAL CHIP 1	1% 1/4W
L141	1-412-029-11	INDUCTOR CHIP	10uH	R129	1-216-298-00	METAL CHIP 2.2	5% 1/10W
L142	1-412-032-11	INDUCTOR CHIP	100uH	R130	1-216-829-11	METAL CHIP 4.7K	5% 1/16W
L143	1-412-029-11	INDUCTOR CHIP	10uH	R131	1-216-837-11	METAL CHIP 22K	5% 1/16W
L144	1-412-032-11	INDUCTOR CHIP	100uH	R132	1-216-840-11	METAL CHIP 39K	5% 1/16W
L145	1-412-032-11	INDUCTOR CHIP	100uH	R133	1-216-821-11	METAL CHIP 1K	5% 1/16W
L146	1-469-855-21	FERRITE	0uH	R134	1-216-821-11	METAL CHIP 1K	5% 1/16W
L147	1-469-855-21	FERRITE	0uH	R135	1-216-821-11	METAL CHIP 1K	5% 1/16W
L161	1-500-245-11	INDUCTOR CHIP	0uH	R136	1-216-302-00	METAL CHIP 2.7	5% 1/10W
L171	1-500-245-11	INDUCTOR CHIP	0uH	R138	1-216-833-11	METAL CHIP 10K	5% 1/16W
L180	1-469-855-21	FERRITE	0uH	R150	1-216-833-11	METAL CHIP 10K	5% 1/16W
L181	1-469-855-21	FERRITE	0uH	R151	1-216-833-11	METAL CHIP 10K	5% 1/16W
L182	1-500-245-11	INDUCTOR CHIP	0uH	R153	1-216-833-11	METAL CHIP 10K	5% 1/16W
L183	1-216-296-91	SHORT	0	R155	1-216-864-11	METAL CHIP 0	5% 1/16W
L184	1-216-296-91	SHORT	0	R156	1-216-864-11	METAL CHIP 0	5% 1/16W
< TRANSISTOR >							
Q101	8-729-403-35	TRANSISTOR UN5113-TX		R157	1-216-809-11	METAL CHIP 100	5% 1/16W
Q121	8-729-403-35	TRANSISTOR UN5113-TX		R158	1-216-809-11	METAL CHIP 100	5% 1/16W
Q122	8-729-101-07	TRANSISTOR 2SB798-T1DK		R159	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
Q131	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR		R160	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
Q132	8-729-903-10	TRANSISTOR FMW1-T-148		R161	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
Q133	8-729-402-93	TRANSISTOR UN5214-TX		R163	1-216-809-11	METAL CHIP 100	5% 1/16W
Q134	8-729-402-93	TRANSISTOR UN5214-TX		R164	1-216-809-11	METAL CHIP 100	5% 1/16W
Q181	8-729-048-87	TRANSISTOR 2SJ518AZTR		R165	1-216-809-11	METAL CHIP 100	5% 1/16W
Q182	8-729-048-88	TRANSISTOR 2SK2788VYTR		R166	1-216-809-11	METAL CHIP 100	5% 1/16W
< RESISTOR >							
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		
R102	1-216-853-11	METAL CHIP	470K	5%	1/16W		
R103	1-216-863-11	RES-CHIP	3.3M	5%	1/16W		
R104	1-216-853-11	METAL CHIP	470K	5%	1/16W		
R105	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		
R106	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		
R107	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		
R108	1-216-833-11	METAL CHIP	10K	5%	1/16W		
R109	1-216-845-11	METAL CHIP	100K	5%	1/16W		
R110	1-216-845-11	METAL CHIP	100K	5%	1/16W		
R111	1-216-833-11	METAL CHIP	10K	5%	1/16W		
R112	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		
R173	1-216-821-11	METAL CHIP	1K	5%	1/16W		
R174	1-216-811-11	METAL CHIP	150	5%	1/16W		
R177	1-216-805-11	METAL CHIP	47	5%	1/16W		
R178	1-216-864-11	METAL CHIP	0	5%	1/16W		
R179	1-216-295-11	SHORT	0				
R181	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R182	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R183	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R185	1-216-295-11	SHORT	0				
R195	1-216-833-11	METAL CHIP	10K	5%	1/16W		
R196	1-216-833-11	METAL CHIP	10K	5%	1/16W		
R197	1-216-833-11	METAL CHIP	10K	5%	1/16W		
R218	1-216-864-11	METAL CHIP	0	5%	1/16W		

* This is a written EEPROM. Not supplied in independently but is supplied as the BD BOARD, COMPLETE.

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
		< SWITCH >					
S101	1-762-596-21	SWITCH, PUSH (1 KEY) (LIMIT SW)		C20	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
S103	1-771-956-21	SWITCH, PUSH (1 KEY) (OUT SW)		C21	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
S104	1-771-955-21	SWITCH, PUSH (1 KEY) (PLAY SW)		C22	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
S105	1-771-955-21	SWITCH, PUSH (1 KEY) (REC SW)					
		< VIBRATOR >		C23	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
X171	1-781-569-21	OSCILLATOR, CRYSTAL (90MHz)		C24	1-163-251-11	CERAMIC CHIP 100PF 5%	50V

	1-679-017-11	CLIP BOARD		C25	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		*****		C29	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< CAPACITOR >		C30	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C651	1-126-206-11	ELECT CHIP 100uF 20%	6.3V	C31	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C652	1-165-319-11	CERAMIC CHIP 0.1uF	50V	C32	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C653	1-165-319-11	CERAMIC CHIP 0.1uF	50V	C33	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C654	1-165-319-11	CERAMIC CHIP 0.1uF	50V	C34	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C655	1-165-319-11	CERAMIC CHIP 0.1uF	50V	C35	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< CONNECTOR >		C36	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
CN651	1-695-093-11	SOCKET, CONNECTOR 9P		C38	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< IC >		C39	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
IC651	8-759-242-74	IC TC7W04F(TE12R)		C40	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
IC652	8-759-232-44	IC TC74HC125AF(EL)		C41	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
IC653	8-759-232-71	IC TC74HC161AF(EL)					
IC654	8-759-180-84	IC TC7W74F(TE12R)		C42	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< RESISTOR >		C43	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
R650	1-216-025-11	RES-CHIP 100 5%	1/10W	C44	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
R651	1-216-025-11	RES-CHIP 100 5%	1/10W	C45	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
R652	1-216-025-11	RES-CHIP 100 5%	1/10W	C48	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
R653	1-216-025-11	RES-CHIP 100 5%	1/10W				
R654	1-216-295-11	SHORT 0		C50	1-165-319-11	CERAMIC CHIP 0.1uF	50V
R655	1-216-025-11	RES-CHIP 100 5%	1/10W	C101	1-126-966-11	ELECT 33uF 20%	16V
R656	1-216-025-11	RES-CHIP 100 5%	1/10W	C102	1-126-963-11	ELECT 4.7uF 20%	50V
R657	1-216-025-11	RES-CHIP 100 5%	1/10W	C109	1-165-319-11	CERAMIC CHIP 0.1uF	50V
R658	1-216-073-00	METAL CHIP 10K 5%	1/10W	C131	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
R659	1-216-073-00	METAL CHIP 10K 5%	1/10W				

	A-4725-065-A	MAIN BOARD, COMPLETE		C132	1-165-319-11	CERAMIC CHIP 0.1uF	50V
		*****		C135	1-165-319-11	CERAMIC CHIP 0.1uF	50V
*	4-374-846-11	COVER, CAPACITOR, CAP TYPE		C139	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
	7-685-871-01	SCREW +BVTT 3X6 (S)		C141	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
		< CAPACITOR >		C142	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C1	1-163-251-11	CERAMIC CHIP 100PF 5%	50V				
C2	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C143	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C3	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C201	1-126-939-11	ELECT 10000uF 20%	16V
C4	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C202	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C5	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C203	1-126-927-11	ELECT 2200uF 20%	10V
				C211	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C6	1-163-251-11	CERAMIC CHIP 100PF 5%	50V				
C7	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C212	1-126-964-11	ELECT 10uF 20%	50V
C8	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C213	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C16	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C214	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C17	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C215	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C216	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C18	1-163-251-11	CERAMIC CHIP 100PF 5%	50V				
C19	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	C217	1-104-665-11	ELECT 100uF 20%	10V
				C301	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C302	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C303	1-126-939-11	ELECT 10000uF 20%	16V
				C304	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C305	1-126-926-11	ELECT 1000uF 20%	10V
				C306	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C351	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C352	1-126-933-11	ELECT 100uF 20%	16V
				C401	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C402	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C403	1-128-576-11	ELECT 100uF 20%	63V
				C404	1-126-967-11	ELECT 47uF 20%	50V
				C405	1-165-319-11	CERAMIC CHIP 0.1uF	50V
				C501	1-104-665-11	ELECT 100uF 20%	10V
				C505	1-163-251-11	CERAMIC CHIP 100PF 5%	50V

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C519	1-163-009-11	CERAMIC CHIP	0.001uF 10%	50V		< CONNECTOR >	
C523	1-165-319-11	CERAMIC CHIP	0.1uF	50V			
C526	1-163-009-11	CERAMIC CHIP	0.001uF 10%	50V	CN201	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P
C538	1-163-251-11	CERAMIC CHIP	100PF 5%	50V	CN301	1-793-991-11	CONNECTOR, FFC/FPC 23P
					CN302	1-784-384-11	CONNECTOR, FFC/FPC 27P
C542	1-163-251-11	CERAMIC CHIP	100PF 5%	50V	CN306	1-568-440-11	SOCKET, CONNECTOR 17P
C547	1-163-251-11	CERAMIC CHIP	100PF 5%	50V	CN308	1-785-759-12	CONNECTOR (I-LINK), SQUARE 4P (i.LINK S200)
C548	1-163-251-11	CERAMIC CHIP	100PF 5%	50V			
C550	1-163-251-11	CERAMIC CHIP	100PF 5%	50V	CN309	1-785-759-12	CONNECTOR (I-LINK), SQUARE 4P (i.LINK S200)
C559	1-165-319-11	CERAMIC CHIP	0.1uF	50V	CN652	1-695-088-11	PIN, CONNECTOR (PC BOARD) 9P
C596	1-165-319-11	CERAMIC CHIP	0.1uF	50V		< DIODE >	
C600	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D101	8-719-988-61	DIODE 1SS355TE-17
C601	1-104-665-11	ELECT	100uF 20%	10V	D102	8-719-988-61	DIODE 1SS355TE-17
C612	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D201	8-719-072-41	DIODE SFPB-52VL
C619	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D202	8-719-072-41	DIODE SFPB-52VL
					D203	8-719-072-41	DIODE SFPB-52VL
C628	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D204	8-719-072-41	DIODE SFPB-52VL
C630	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D206	8-719-988-61	DIODE 1SS355TE-17
C632	1-164-489-11	CERAMIC CHIP	0.22uF 10%	16V	D207	8-719-072-41	DIODE SFPB-52VL
C633	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	D208	8-719-072-41	DIODE SFPB-52VL
C634	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D301	8-719-210-29	DIODE F10P10Q
C646	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D401	8-719-210-33	DIODE EC10DS2TE12R
C656	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D402	8-719-976-99	DIODE DTZ-TT11-5.1B
C657	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D789	8-719-058-24	DIODE RB501V-40TE-17
C662	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D790	8-719-058-24	DIODE RB501V-40TE-17
C682	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D791	8-719-058-24	DIODE RB501V-40TE-17
C685	1-163-009-11	CERAMIC CHIP	0.001uF 10%	50V	D792	8-719-058-24	DIODE RB501V-40TE-17
C695	1-165-319-11	CERAMIC CHIP	0.1uF	50V	D801	8-719-105-99	DIODE DTZ-TT11-6.2A
C701	1-104-665-11	ELECT	100uF 20%	10V		< TERMINAL >	
C707	1-165-319-11	CERAMIC CHIP	0.1uF	50V	EP201	1-537-770-21	TERMINAL BOARD, GROUND
C712	1-165-319-11	CERAMIC CHIP	0.1uF	50V	EP306	1-537-770-21	TERMINAL BOARD, GROUND
C718	1-165-319-11	CERAMIC CHIP	0.1uF	50V	EP601	1-537-770-21	TERMINAL BOARD, GROUND
C726	1-165-319-11	CERAMIC CHIP	0.1uF	50V	EP911	1-537-770-21	TERMINAL BOARD, GROUND
C728	1-165-319-11	CERAMIC CHIP	0.1uF	50V		< IC >	
C729	1-165-319-11	CERAMIC CHIP	0.1uF	50V	IC101	8-759-678-77	IC LA5643
C732	1-163-217-11	CERAMIC CHIP	1PF 0.25PF	50V	IC201	8-759-520-49	IC PQ30RV21
C733	1-163-217-11	CERAMIC CHIP	1PF 0.25PF	50V	IC351	8-759-450-49	IC BA07T
C737	1-165-319-11	CERAMIC CHIP	0.1uF	50V	IC431	8-759-633-42	IC M5293L
C738	1-163-253-11	CERAMIC CHIP	120PF 5%	50V	IC501	8-759-677-81	IC M30805SGP
C739	1-163-102-00	CERAMIC CHIP	24PF 5%	50V	IC502	8-759-685-96	IC MT28F800B3WG-10T-LISSA
C740	1-165-319-11	CERAMIC CHIP	0.1uF	50V	IC601	8-752-403-47	IC CXD3202AR
C741	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	IC602	8-759-669-75	IC TLC2932IPW-E20
C745	1-165-319-11	CERAMIC CHIP	0.1uF	50V	IC655	8-759-062-66	IC TC7S66F-TE85L
C747	1-164-336-11	CERAMIC CHIP	0.33uF	25V	IC656	8-759-011-65	IC TC74HC4053F(EL)
C749	1-163-127-00	CERAMIC CHIP	270PF 5%	50V	IC701	8-752-396-41	IC CXD1945R
C752	1-164-336-11	CERAMIC CHIP	0.33uF	25V	IC801	8-759-822-09	IC LB1641
C753	1-164-336-11	CERAMIC CHIP	0.33uF	25V		< COIL >	
C754	1-164-336-11	CERAMIC CHIP	0.33uF	25V	L501	1-412-056-11	INDUCTOR CHIP 4.7uH
C757	1-163-127-00	CERAMIC CHIP	270PF 5%	50V	L601	1-412-056-11	INDUCTOR CHIP 4.7uH
C760	1-164-336-11	CERAMIC CHIP	0.33uF	25V	L602	1-412-056-11	INDUCTOR CHIP 4.7uH
C763	1-165-319-11	CERAMIC CHIP	0.1uF	50V	L701	1-412-056-11	INDUCTOR CHIP 4.7uH
C773	1-165-319-11	CERAMIC CHIP	0.1uF	50V		< TRANSISTOR >	
C780	1-165-319-11	CERAMIC CHIP	0.1uF	50V	Q790	8-729-029-88	TRANSISTOR DTC124TSA-TP
C790	1-165-319-11	CERAMIC CHIP	0.1uF	50V	Q791	8-729-029-88	TRANSISTOR DTC124TSA-TP
C791	1-165-319-11	CERAMIC CHIP	0.1uF	50V	Q792	8-729-029-49	TRANSISTOR DTA143TSA-TP
C801	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V			
C803	1-104-665-11	ELECT	100uF 20%	25V			
C804	1-126-965-11	ELECT	22uF 20%	50V			
C911	1-165-319-11	CERAMIC CHIP	0.1uF	50V			

MAIN

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
Q793	8-729-029-49	TRANSISTOR DTA143TSA-TP		R552	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q801	8-729-119-76	TRANSISTOR 2SA1115TP-EF		R554	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q802	8-729-900-80	TRANSISTOR UN4211-TA		R567	1-216-073-00	METAL CHIP 10K 5%	1/10W
	< RESISTOR >			R568	1-216-073-00	METAL CHIP 10K 5%	1/10W
R2	1-216-073-00	METAL CHIP 10K 5%	1/10W	R569	1-216-073-00	METAL CHIP 10K 5%	1/10W
R3	1-216-073-00	METAL CHIP 10K 5%	1/10W	R570	1-216-073-00	METAL CHIP 10K 5%	1/10W
R4	1-216-073-00	METAL CHIP 10K 5%	1/10W	R571	1-216-073-00	METAL CHIP 10K 5%	1/10W
R5	1-216-073-00	METAL CHIP 10K 5%	1/10W	R586	1-216-073-00	METAL CHIP 10K 5%	1/10W
R6	1-216-073-00	METAL CHIP 10K 5%	1/10W	R587	1-216-073-00	METAL CHIP 10K 5%	1/10W
R7	1-216-073-00	METAL CHIP 10K 5%	1/10W	R588	1-216-073-00	METAL CHIP 10K 5%	1/10W
R8	1-216-073-00	METAL CHIP 10K 5%	1/10W	R590	1-216-073-00	METAL CHIP 10K 5%	1/10W
R9	1-216-073-00	METAL CHIP 10K 5%	1/10W	R602	1-216-295-11	SHORT 0	
R10	1-216-073-00	METAL CHIP 10K 5%	1/10W	R605	1-216-073-00	METAL CHIP 10K 5%	1/10W
R11	1-216-073-00	METAL CHIP 10K 5%	1/10W	R606	1-216-073-00	METAL CHIP 10K 5%	1/10W
R12	1-216-073-00	METAL CHIP 10K 5%	1/10W	R607	1-216-073-00	METAL CHIP 10K 5%	1/10W
R13	1-216-073-00	METAL CHIP 10K 5%	1/10W	R609	1-216-295-11	SHORT 0	
R17	1-216-073-00	METAL CHIP 10K 5%	1/10W	R610	1-216-295-11	SHORT 0	
R19	1-216-073-00	METAL CHIP 10K 5%	1/10W	R611	1-216-295-11	SHORT 0	
R20	1-216-073-00	METAL CHIP 10K 5%	1/10W	R631	1-216-663-11	METAL CHIP 3.3K 0.5%	1/10W
R21	1-216-073-00	METAL CHIP 10K 5%	1/10W	R632	1-216-643-11	METAL CHIP 470 0.5%	1/10W
R22	1-216-073-00	METAL CHIP 10K 5%	1/10W	R633	1-216-657-11	METAL CHIP 1.8K 0.5%	1/10W
R39	1-216-073-00	METAL CHIP 10K 5%	1/10W	R660	1-216-073-00	METAL CHIP 10K 5%	1/10W
R41	1-216-073-00	METAL CHIP 10K 5%	1/10W	R674	1-216-021-00	METAL CHIP 68 5%	1/10W
R50	1-216-073-00	METAL CHIP 10K 5%	1/10W	R675	1-216-021-00	METAL CHIP 68 5%	1/10W
R52	1-216-073-00	METAL CHIP 10K 5%	1/10W	R676	1-216-021-00	METAL CHIP 68 5%	1/10W
R99	1-216-037-00	METAL CHIP 330 5%	1/10W	R677	1-216-021-00	METAL CHIP 68 5%	1/10W
R100	1-216-037-00	METAL CHIP 330 5%	1/10W	R678	1-216-295-11	SHORT 0	
R101	1-216-037-00	METAL CHIP 330 5%	1/10W	R679	1-216-295-11	SHORT 0	
R102	1-216-045-11	METAL CHIP 680 5%	1/10W	R680	1-216-295-11	SHORT 0	
R103	1-216-037-00	METAL CHIP 330 5%	1/10W	R699	1-216-295-11	SHORT 0	
R118	1-216-065-91	RES-CHIP 4.7K 5%	1/10W	R705	1-216-073-00	METAL CHIP 10K 5%	1/10W
R201	1-216-611-11	METAL CHIP 22 0.5%	1/10W	R708	1-216-021-00	METAL CHIP 68 5%	1/10W
R202	1-216-647-11	METAL CHIP 680 0.5%	1/10W	R738	1-216-657-11	METAL CHIP 1.8K 0.5%	1/10W
R203	1-216-641-11	METAL CHIP 390 0.5%	1/10W	R739	1-216-653-11	METAL CHIP 1.2K 0.5%	1/10W
R205	1-216-033-00	METAL CHIP 220 5%	1/10W	R741	1-216-681-11	METAL CHIP 18K 0.5%	1/10W
R212	1-216-073-00	METAL CHIP 10K 5%	1/10W	R742	1-216-676-11	METAL CHIP 11K 0.5%	1/10W
R395	1-216-073-00	METAL CHIP 10K 5%	1/10W	R743	1-216-644-11	METAL CHIP 510 0.5%	1/10W
R401	1-216-061-00	METAL CHIP 3.3K 5%	1/10W	R744	1-216-646-11	METAL CHIP 620 0.5%	1/10W
R402	1-216-093-91	RES-CHIP 68K 5%	1/10W	R748	1-216-668-11	METAL CHIP 5.1K 0.5%	1/10W
R403	1-216-025-11	RES-CHIP 100 5%	1/10W	R749	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R404	1-216-025-11	RES-CHIP 100 5%	1/10W	R750	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R405	1-216-679-11	METAL CHIP 15K 0.5%	1/10W	R751	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R503	1-216-097-11	RES-CHIP 100K 5%	1/10W	R752	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R504	1-216-295-11	SHORT 0		R756	1-216-668-11	METAL CHIP 5.1K 0.5%	1/10W
R517	1-216-097-11	RES-CHIP 100K 5%	1/10W	R757	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R519	1-216-073-00	METAL CHIP 10K 5%	1/10W	R758	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R524	1-216-073-00	METAL CHIP 10K 5%	1/10W	R759	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R530	1-216-073-00	METAL CHIP 10K 5%	1/10W	R760	1-216-621-11	METAL CHIP 56 0.5%	1/10W
R534	1-216-073-00	METAL CHIP 10K 5%	1/10W	R778	1-216-073-00	METAL CHIP 10K 5%	1/10W
R538	1-216-073-00	METAL CHIP 10K 5%	1/10W	R790	1-218-776-11	METAL CHIP 1M 0.5%	1/10W
R542	1-216-073-00	METAL CHIP 10K 5%	1/10W	R791	1-218-776-11	METAL CHIP 1M 0.5%	1/10W
R543	1-216-073-00	METAL CHIP 10K 5%	1/10W	R801	1-216-689-11	METAL CHIP 39K 0.5%	1/10W
R544	1-216-295-11	SHORT 0		R802	1-216-085-00	METAL CHIP 33K 5%	1/10W
R545	1-216-073-00	METAL CHIP 10K 5%	1/10W	R803	1-216-091-11	RES-CHIP 56K 5%	1/10W
R546	1-216-073-00	METAL CHIP 10K 5%	1/10W	R804	1-216-651-11	METAL CHIP 1K 0.5%	1/10W
R547	1-216-073-00	METAL CHIP 10K 5%	1/10W		< VIBRATOR >		
R549	1-216-073-00	METAL CHIP 10K 5%	1/10W	X501	1-781-174-21	VIBRATOR, CERAMIC (10MHZ)	
R550	1-216-073-00	METAL CHIP 10K 5%	1/10W	X702	1-567-970-11	VIBRATOR, CRYSTAL (24.576MHZ)	
R551	1-216-073-00	METAL CHIP 10K 5%	1/10W	*****			

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	A-4725-068-A	PANEL BOARD, COMPLETE *****		Q124	8-729-421-22	TRANSISTOR UN2211-TX	
				Q125	8-729-421-22	TRANSISTOR UN2211-TX	
	4-225-908-01	HOLDER (FL)		Q126	8-729-421-22	TRANSISTOR UN2211-TX	
	4-225-910-01	HOLDER (FUNCTION)		Q127	8-729-421-22	TRANSISTOR UN2211-TX	
	4-225-911-01	HOLDER (DISPLAY)		Q129	8-729-421-22	TRANSISTOR UN2211-TX	
	4-225-921-01	CUSHION (FL)		Q131	8-729-421-22	TRANSISTOR UN2211-TX	
		< CAPACITOR >		Q133	8-729-421-22	TRANSISTOR UN2211-TX	
C101	1-165-319-11	CERAMIC CHIP 0.1uF	50V	Q135	8-729-421-22	TRANSISTOR UN2211-TX	
C111	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	Q137	8-729-421-22	TRANSISTOR UN2211-TX	
C112	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	Q139	8-729-421-22	TRANSISTOR UN2211-TX	
C114	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	Q141	8-729-424-08	TRANSISTOR UN2111-TX	
C128	1-163-275-11	CERAMIC CHIP 0.001uF 5%	50V	Q142	8-729-424-08	TRANSISTOR UN2111-TX	
C130	1-163-275-11	CERAMIC CHIP 0.001uF 5%	50V	Q911	8-729-421-22	TRANSISTOR UN2211-TX	
C132	1-163-275-11	CERAMIC CHIP 0.001uF 5%	50V	Q912	8-729-421-22	TRANSISTOR UN2211-TX	
C931	1-124-584-00	ELECT 100uF 20%	10V			< RESISTOR >	
C932	1-163-021-91	CERAMIC CHIP 0.01uF 10%	50V	R101	1-216-073-00	METAL CHIP 10K 5%	1/10W
C955	1-126-162-11	ELECT 3.3uF 20%	50V	R120	1-216-035-00	METAL CHIP 270 5%	1/10W
C956	1-165-319-11	CERAMIC CHIP 0.1uF	50V	R122	1-216-041-00	METAL CHIP 470 5%	1/10W
C958	1-163-243-11	CERAMIC CHIP 47PF 5%	50V	R123	1-216-041-00	METAL CHIP 470 5%	1/10W
C960	1-165-319-11	CERAMIC CHIP 0.1uF	50V	R124	1-216-035-00	METAL CHIP 270 5%	1/10W
C961	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	R125	1-216-035-00	METAL CHIP 270 5%	1/10W
C962	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	R126	1-216-041-00	METAL CHIP 470 5%	1/10W
C963	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	R127	1-216-031-00	METAL CHIP 180 5%	1/10W
C964	1-165-319-11	CERAMIC CHIP 0.1uF	50V	R128	1-216-073-00	METAL CHIP 10K 5%	1/10W
C965	1-126-153-11	ELECT 22uF 20%	6.3V	R129	1-216-031-00	METAL CHIP 180 5%	1/10W
		< CONNECTOR >		R130	1-216-073-00	METAL CHIP 10K 5%	1/10W
CN902	1-568-438-11	SOCKET, CONNECTOR 17P		R131	1-216-031-00	METAL CHIP 180 5%	1/10W
		< DIODE >		R132	1-216-073-00	METAL CHIP 10K 5%	1/10W
D120	8-719-032-98	DIODE SEL5820A-TP15 (LP)		R133	1-216-035-00	METAL CHIP 270 5%	1/10W
D122	8-719-038-63	DIODE SEL5220S-TH8F (REC ●)		R135	1-216-035-00	METAL CHIP 270 5%	1/10W
D123	8-719-038-63	DIODE SEL5220S-TH8F (CD SYNCHRO)		R137	1-216-035-00	METAL CHIP 270 5%	1/10W
D124	8-719-057-28	DIODE SML78420-TP4 (PLAY/PAUSE)		R139	1-216-035-00	METAL CHIP 270 5%	1/10W
D126	8-719-032-86	DIODE SEL5420E-TH8F (HIGH SPEED)		R181	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
D127	8-719-072-76	DIODE SEL5E23C-TP15 (≡)		R182	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
D129	8-719-072-76	DIODE SEL5E23C-TP15 (■)		R183	1-216-065-91	RES-CHIP 4.7K 5%	1/10W
D131	8-719-072-76	DIODE SEL5E23C-TP15 (▷◁)		R184	1-216-073-00	METAL CHIP 10K 5%	1/10W
D133	8-719-038-54	DIODE SEL5520C-TP15 (▶▶)		R282	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
D135	8-719-038-54	DIODE SEL5520C-TP15 (◀◀)		R283	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
D137	8-719-038-54	DIODE SEL5520C-TP15 (REC MODE)		R284	1-216-065-91	RES-CHIP 4.7K 5%	1/10W
D139	8-719-038-54	DIODE SEL5520C-TP15 (DISPLAY)		R285	1-216-073-00	METAL CHIP 10K 5%	1/10W
D911	8-719-812-44	DIODE SEL5220S-TP15 (STANDBY)		R286	1-216-085-00	METAL CHIP 33K 5%	1/10W
D912	8-719-038-54	DIODE SEL5520C-TP15 (H.A.T.S)		R760	1-216-025-11	RES-CHIP 100 5%	1/10W
		< FLUORESCENT INDICATOR TUBE >		R761	1-216-025-11	RES-CHIP 100 5%	1/10W
FL921	1-517-888-11	INDICATOR TUBE, FLUORESCENT		R762	1-216-025-11	RES-CHIP 100 5%	1/10W
		< IC >		R763	1-216-025-11	RES-CHIP 100 5%	1/10W
IC101	8-759-268-29	IC SN74HC595ANSR		R911	1-216-027-00	METAL CHIP 120 5%	1/10W
IC901	8-759-659-03	IC MSM9202-07GS-K		R912	1-216-021-00	METAL CHIP 68 5%	1/10W
IC931	8-749-013-92	IC GP1UC7X (REMOTE SENSOR)		R931	1-216-025-11	RES-CHIP 100 5%	1/10W
		< TRANSISTOR >		R932	1-216-017-91	RES-CHIP 47 5%	1/10W
Q120	8-729-421-22	TRANSISTOR UN2211-TX		R959	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
Q122	8-729-421-22	TRANSISTOR UN2211-TX				< SWITCH >	
Q123	8-729-421-22	TRANSISTOR UN2211-TX		S101	1-762-875-21	SWITCH, KEYBOARD (DISPLAY)	
				S102	1-762-875-21	SWITCH, KEYBOARD (INPUT)	
				S104	1-762-875-21	SWITCH, KEYBOARD (REC MODE)	
				S108	1-762-875-21	SWITCH, KEYBOARD (◀◀)	
				S109	1-762-875-21	SWITCH, KEYBOARD (▶▶)	

MDS-LSA1

PANEL

TRANS

Ref. No.	Part No.	Description	Remarks
S282	1-762-875-21	SWITCH, KEYBOARD (CD SYNCHRO)	
S283	1-762-875-21	SWITCH, KEYBOARD (REC ●)	
S284	1-762-875-21	SWITCH, KEYBOARD (■)	
S285	1-762-875-21	SWITCH, KEYBOARD (▷)	
S286	1-762-875-21	SWITCH, KEYBOARD (△)	
S287	1-762-875-21	SWITCH, KEYBOARD (I/⏻)	

	1-677-161-11	TRANS BOARD	

		< CAPACITOR >	
△ C901	1-113-925-11	CERAMIC	0.01uF 20% 250V
△ C902	1-113-925-11	CERAMIC	0.01uF 20% 250V
△ C903	1-113-920-11	CERAMIC	0.0022uF 20% 250V
		< CONNECTOR >	
* CN901	1-580-230-31	PIN, CONNECTOR (PC BOARD) 2P	
CN902	1-691-772-11	PLUG (MICRO CONNECTOR) 10P	
		< DIODE >	
D911	8-719-988-61	DIODE 1SS355TE-17	
		< LINE FILTER >	
△ LF901	1-424-485-11	FILTER, LINE	
		< TRANSISTOR >	
Q451	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW	
		< RESISTOR >	
R451	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R452	1-216-089-11	RES-CHIP	47K 5% 1/10W
		< RELAY >	
△ RY911	1-755-356-11	RELAY	
		< TRANSFORMER >	
△ T901	1-435-397-11	TRANSFORMER, POWER	
△ T911	1-435-398-11	TRANSFORMER, POWER	

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	

12	1-773-037-11	WIRE (FLAT TYPE) (17 CORE)	
55	1-792-441-11	WIRE (FLAT TYPE) (23 CORE)	
56	1-792-442-11	WIRE (FLAT TYPE) (27 CORE)	
△ 58	1-782-603-11	CORD, POWER	
61	1-569-972-21	SOCKET, SHORT 2P	
△ 358	A-4672-976-A	OPTICAL PICK-UP KMS-262A/J1N	
FL921	1-517-888-11	INDICATOR TUBE, FLUORESCENT	
HR901	1-500-670-11	HEAD, OVER LIGHT	
M101	A-4735-029-A	MOTOR ASSY, SPINDLE	
M102	A-4672-900-A	MOTOR ASSY, SLED	
M103	A-4672-975-A	MOTOR ASSY, LOADING	
S102	1-771-957-11	SWITCH, PUSH	
		(2 KEY) (REFLECT/PROTECT SW)	
△ T911	1-435-398-11	TRANSFORMER, POWER	

		ACCESSORIES & PACKING MATERIALS	

	1-476-032-11	REMOTE COMMANDER (RM-LSA1M)	
	1-792-129-11	CORD, CONNECTION (i.LINK)	
	4-227-585-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH)	
	4-227-585-21	MANUAL, INSTRUCTION (GERMAN,SPANISH)	
	4-227-585-31	MANUAL, INSTRUCTION (DUTCH,SWEDISH)	
	4-227-585-41	MANUAL, INSTRUCTION	
		(ITALIAN,PORTUGUESE)	
	4-982-828-21	COVER, BATTERY (FOR RM-LSA1M)	

		HARDWARE LIST	

#1	7-685-872-09	SCREW +BVTT 3X8 TYPE2 TT (B)	
#2	7-685-862-09	SCREW +BVTT 2.6X6 (S)	
#3	7-685-871-01	SCREW +BVTT 3X6 (S)	
#4	7-685-646-79	SCREW +BVTP 3X8	
#11	7-685-850-04	SCREW +BVTT 2X3 (S)	
#12	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT	

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