

MDS-JE640

SERVICE MANUAL



Canadian Model
AEP Model
UK Model
E Model



Photo: SILVER

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Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MDM-7A
Optical Pick-up Type	KMS-260B/J1N

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	MAX 44.6 μW^1 <i>1) This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.</i>
Laser diode	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	ACIRC (Advanced Cross Interleave Reed Solomon Code)
Sampling frequency	44.1 kHz
Coding	ATRAC (Adaptive Transform Acoustic Coding)/ATRAC 3
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz $\pm 0.3 \text{ dB}$
Signal-to-noiseratio	Over 98 dB during play
Wow and flutter	Below measurable limit

Inputs

ANALOG IN

Jack type: phono

Impedance: 47 k Ω

Rated input: 500 mVrms

Minimum input: 125 mVrms

DIGITAL IN

Connector type: square optical
Impedance: 660 nm (optical wave length)

DIGITAL OPTICAL IN (AEP, UK, CIS models)

Connector type: square optical
Impedance: 660 nm (optical wave length)

DIGITAL COAXIAL IN (AEP, UK, CIS models)

Jack type: phono

Impedance: 75 Ω

Rated input: 0.5 Vp-p, $\pm 20 \%$

Outputs

PHONES (MDS-JE640 only)

Jack type: stereo phone

Rated output: 28 mW

Load impedance: 32 Ω

ANALOG OUT

Jack type: phono

Rated output: 2 Vrms (at 50 k Ω)

Load impedance: over 10 k Ω

— Continued on next page —

MINIDISC DECK

SONY®

DIGITAL OUT	Connector type: square optical Rated output: -18 dBm Load impedance: 660 nm (optical wave length)
DIGITAL OPTICAL OUT (AEP, UK, CIS models)	Connector type: square optical Rated output: -18 dBm Load impedance: 660 nm (optical wave length)

Power consumption	15 W
Dimensions (approx.)	430 × 95 × 285 mm (17 × 3 3/4 × 11 1/4 in.) (w/h/d) incl. projecting parts and controls
Mass (approx.)	3.1 kg (6 lbs 14 oz)

General

Power requirements

Where purchased	Power requirements
Canadian	120 V AC, 60 Hz
AEP, UK, CIS	220 – 230 V AC, 50/60 Hz
Singapore, Malaysia	110 – 120 or 220 – 240 V AC selectable, 50/60 Hz

Supplied accessories

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

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Design and specifications are subject to change without notice.

SELF-DIAGNOSIS FUNCTION

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

Self-diagnosis function

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

Three- or five-digit code/ Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. ➔ Take out the MD and close the record-protect slot (page 14).
C12/Cannot Copy	You tried to record a CD with a format that the external device connected to the deck does not support, such as CD-ROM or video CD. ➔ Remove the disc and insert a music CD.
C13/REC Error	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.

Three- or five-digit code/ Message	Cause/Remedy
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 32).
C41/Cannot Copy	The sound source is a copy of commercially available music software, or you tried to record a CD-R (Recordable CD). ➔ The Serial Copy Management System prevents making a digital copy (page 52). You cannot record a CD-R.
C71/Din Unlock	The sporadic appearance of this message is caused by the digital signal being recorded. This will not affect the recording.
	While recording from a digital component connected through the DIGITAL IN connector, the digital connecting cable was unplugged or the digital component turned off. ➔ Connect the cable or turn the digital component back on.
E0001/MEMORY NG	There is an error in the internal data that the deck needs in order to operate. ➔ Consult your nearest Sony dealer.
E0101/LASER NG	There is a problem with the optical pickup. ➔ The optical pick-up may have failed. Consult your nearest Sony dealer.

Procedure for using the Self-Diagnosis Function (Error History Display Mode).

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

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

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Selecting the Test Mode

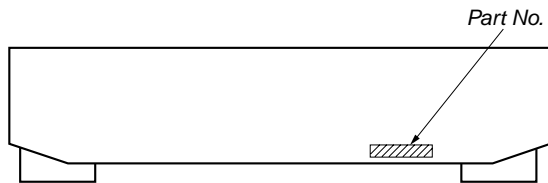
Display	History
op rec tm	Displays the total recording time. When the total recording time is more than 1 minute, displays the hour and minute When less than 1 minute, displays “Under 1 min” The display time is the time the laser is set to high power, which is about 1/4 of the actual recording time.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

MODEL IDENTIFICATION

— BACK PANEL —



MODEL	PARTS No.
AEP, UK, CIS models	4-228-638-0□
Canadian model	4-228-638-3□
SP, MY models	4-228-638-4□

- Abbreviation
 SP : Singapore model
 MY : Malaysia model

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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 UDSAETTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINA NÄKYMÄTTÖMÄLLE LASERSÄTELYLLE, ÄLÄ KATSO SÄTEESEEN.
WARNING : OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÅR ÖPPNAD OCH SPÄRREN ÅR URKÖPPLAD, BETRAKTA EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES, UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYÁZAT! : 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.

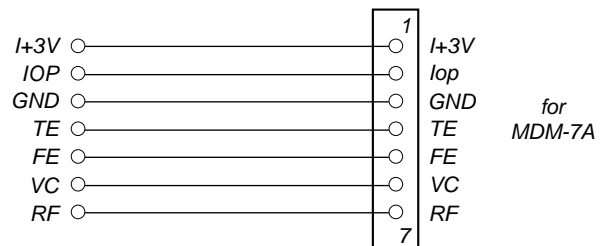
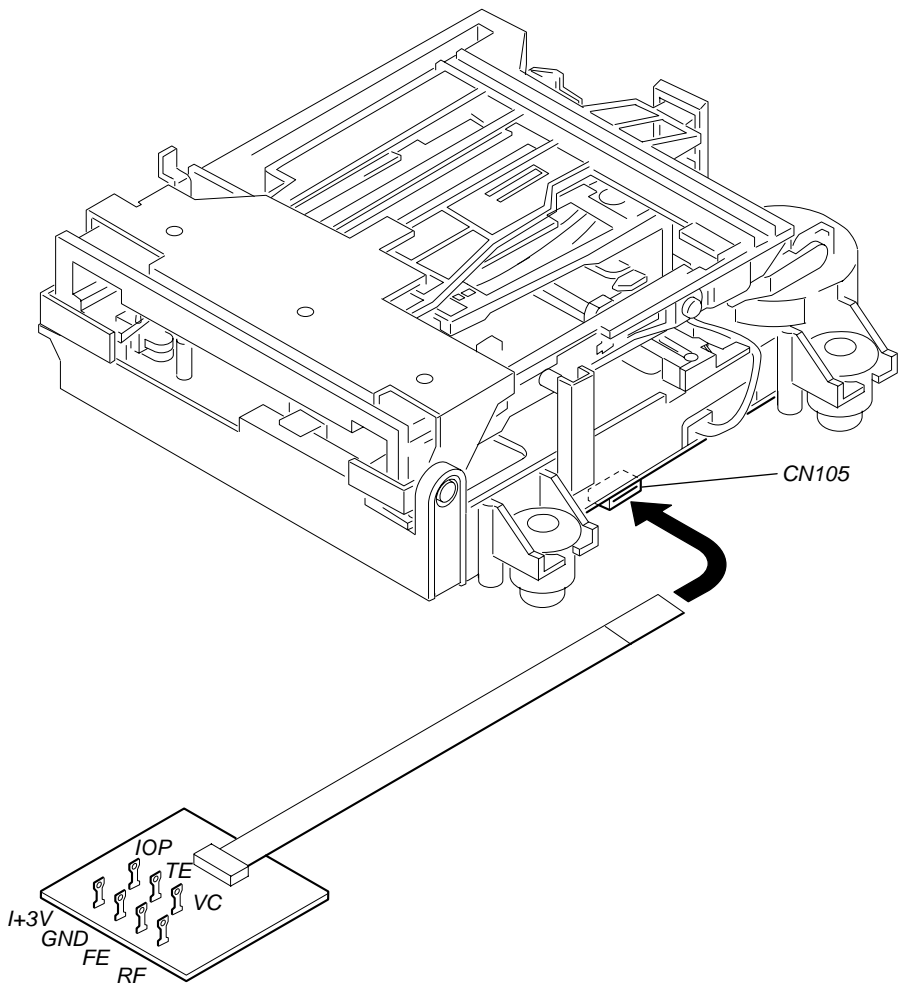
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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

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  knob and  button, connect the power plug to the outlet, and release the  knob and  button.
2. Rotate the  knob to display “[Service]”, and press the  button.
3. Rotate the  knob to display “Iop Write” (C05), 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 : Rotate the  knob.
To select the digit : Press the  knob.
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  knob and  button, connect the power plug to the outlet, and release the  knob and  button.
2. Rotate the  knob to display “[Service]”, and press the  button.
3. Rotate the  knob to display “Iop Read” (C26).
4. “@.@./###.#” is displayed and the recorded contents are displayed.
@.@.@ : indicates the Iop value labeled on the pick-up.
###.# : indicates the Iop value after adjustment
5. To end, press the  button or  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 23)
- 5-6-3. Iop Compare (see page 23)
- 5-6-4. Auto Check (see page 24)

Note:

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

When performing adjustments, use the specified values for adjustments.

FORCED RESET

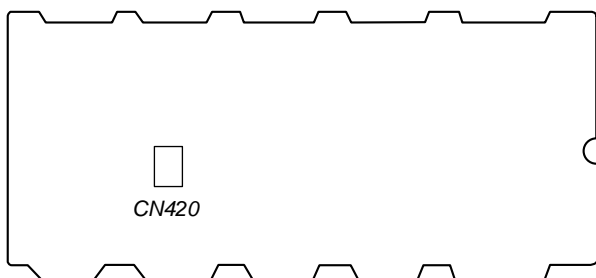
The system microprocessor can be reset in the following procedure.

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

Procedure :

Remove the short-pin attached to CN420, and then attach it again.

[MAIN BOARD] (Component Side)



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:









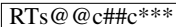
- Procedure 1: Press the  button continuously for about 10 seconds.
Procedure 2: Press the  button while pressing the  button and  button.
- When the mode is set, “RTs 00c 00e 000” is displayed.
- Press the  button to start recording. Then press the  button and start recording.
- To check the “track mode”, press the  button to start play.
- To exit the test mode, press the  button, and turn OFF the power. When “TOC” disappears, disconnect the power plug from the outlet. If the test mode cannot be exited, refer to “Forced Reset” on page 8.

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


Fluorescent display tube display

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

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


Fluorescent display tube display

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

Reading the Retry Cause Display

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 → b2
The retry cause in this case is combined of “access fault”, “IVR rec error”, and “ader5”.

Reading the Track Mode Display

Hexadecimal	Higher Bits				Lower Bits				Hexa- decimal	Details	
	8	4	2	1	8	4	2	1		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

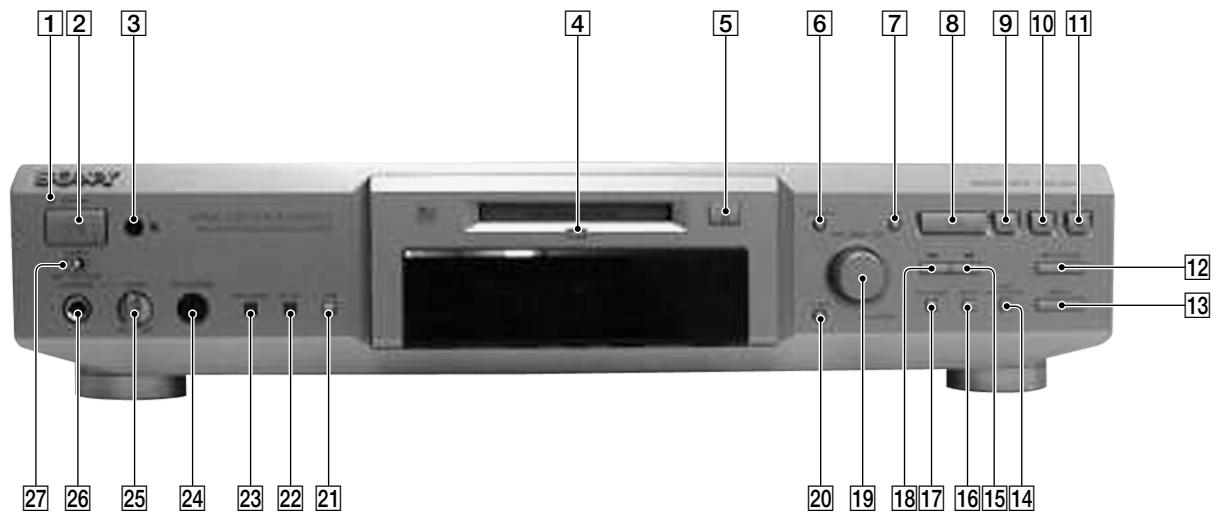
Lower bit : 7 = 0111 → b0+b1+b2

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

SECTION 2 GENERAL

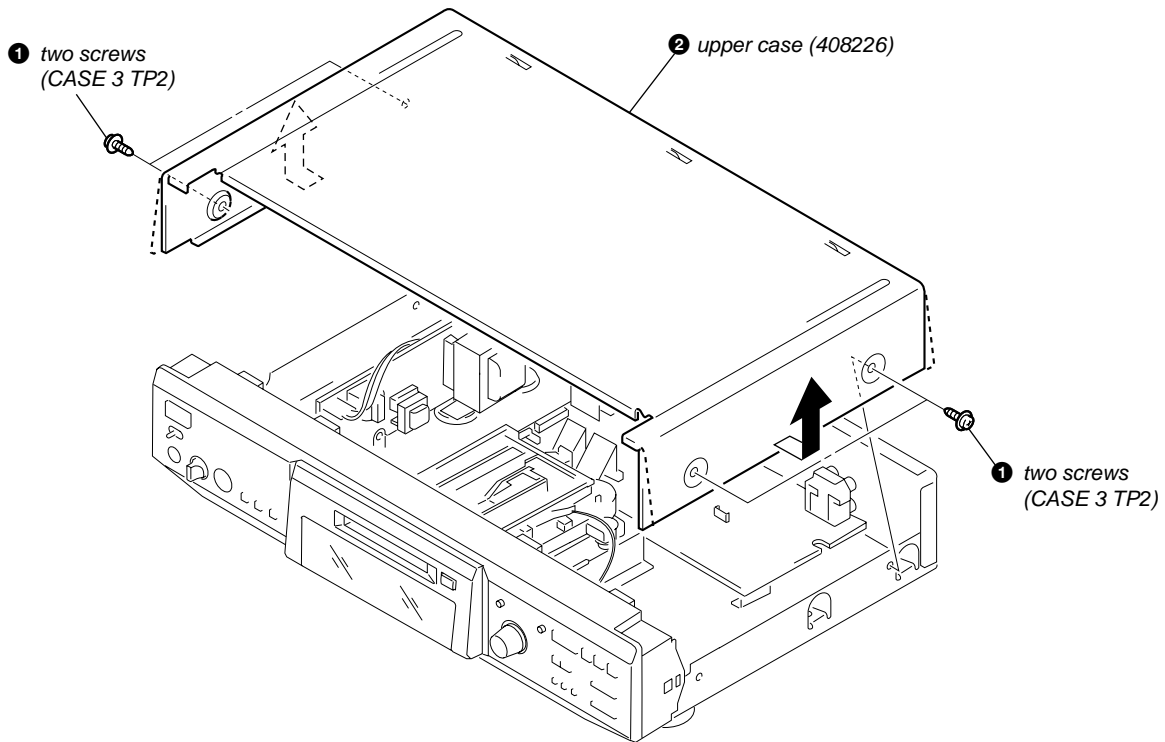


- | | | | |
|-----------|---------------------------|-----------|------------------------------------|
| 1 | STANDBY indicator | 15 | ▷▷ button |
| 2 | I/⏻ (power) button | 16 | REPEAT button |
| 3 | Remote sensor | 17 | PLAY MODE button |
| 4 | MDLP indicator | 18 | <<< button |
| 5 | ⏏ EJECT button | 19 | ⏏ AMS ▷▷ /PUSH ENTER button |
| 6 | MENU/NO button | 20 | CLEAR button |
| 7 | YES button | 21 | TIME button |
| 8 | ▷ button | 22 | SF EDIT button and indicator |
| 9 | ⏏ button | 23 | PITCH CONTROL button and indicator |
| 10 | □ button | 24 | KEYBOARD jack |
| 11 | ● REC button | 25 | LEVEL knob |
| 12 | REC MODE button | 26 | PHONES jack |
| 13 | INPUT button | 27 | TIMER knob |
| 14 | LEVEL/DISPLAY/CHAR button | | |

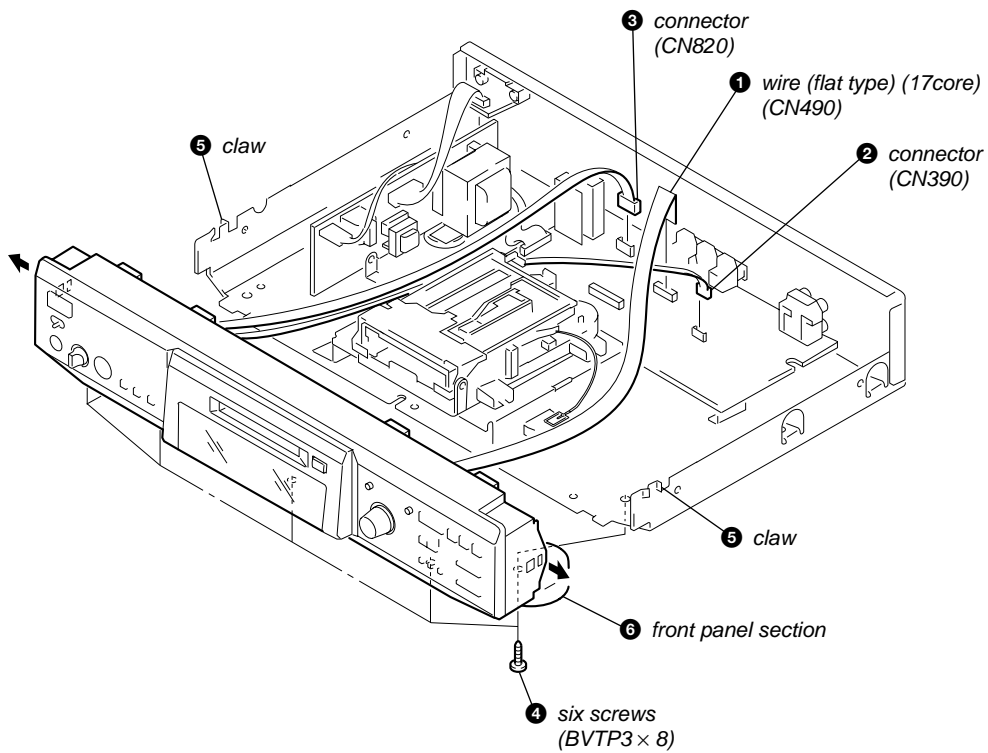
SECTION 3 DISASSEMBLY

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

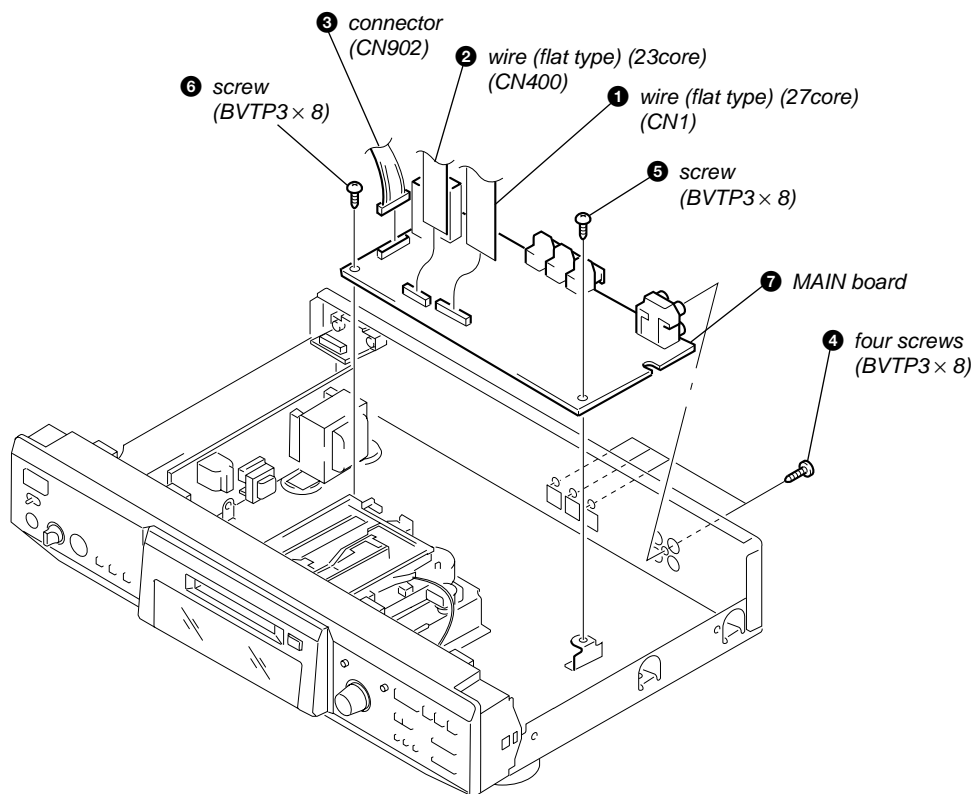
3-1. UPPER CASE (408226)



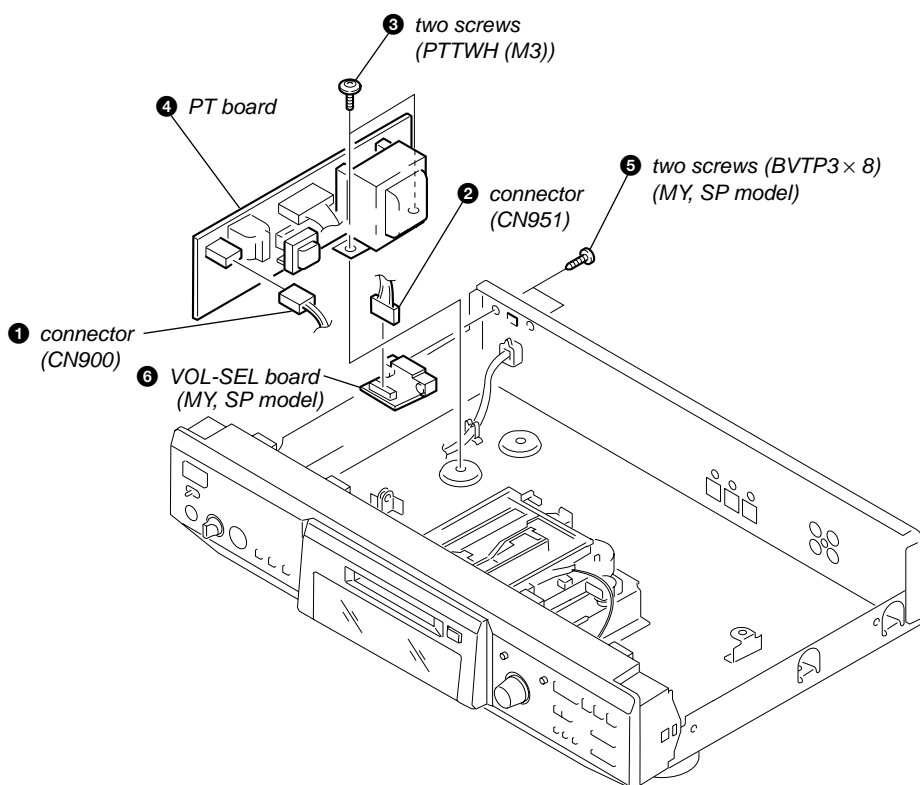
3-2. FRONT PANEL SECTION



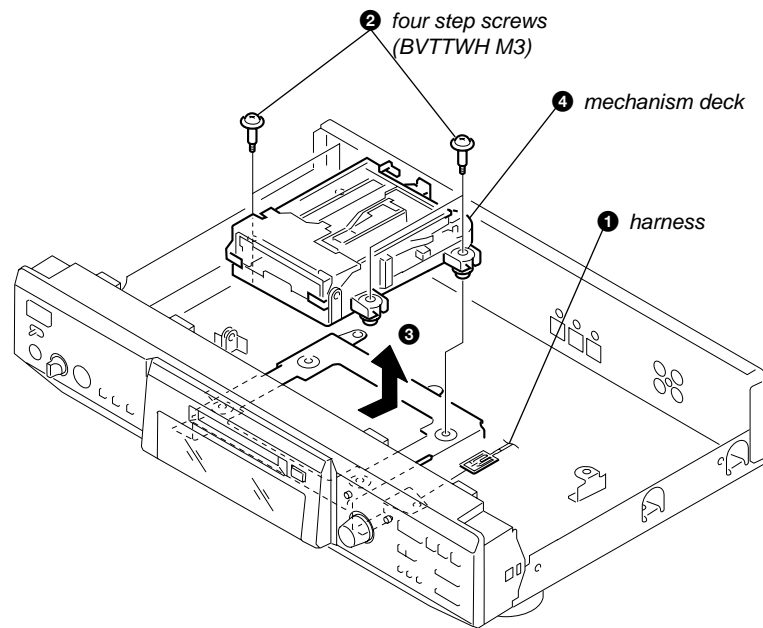
3-3. MAIN BOARD



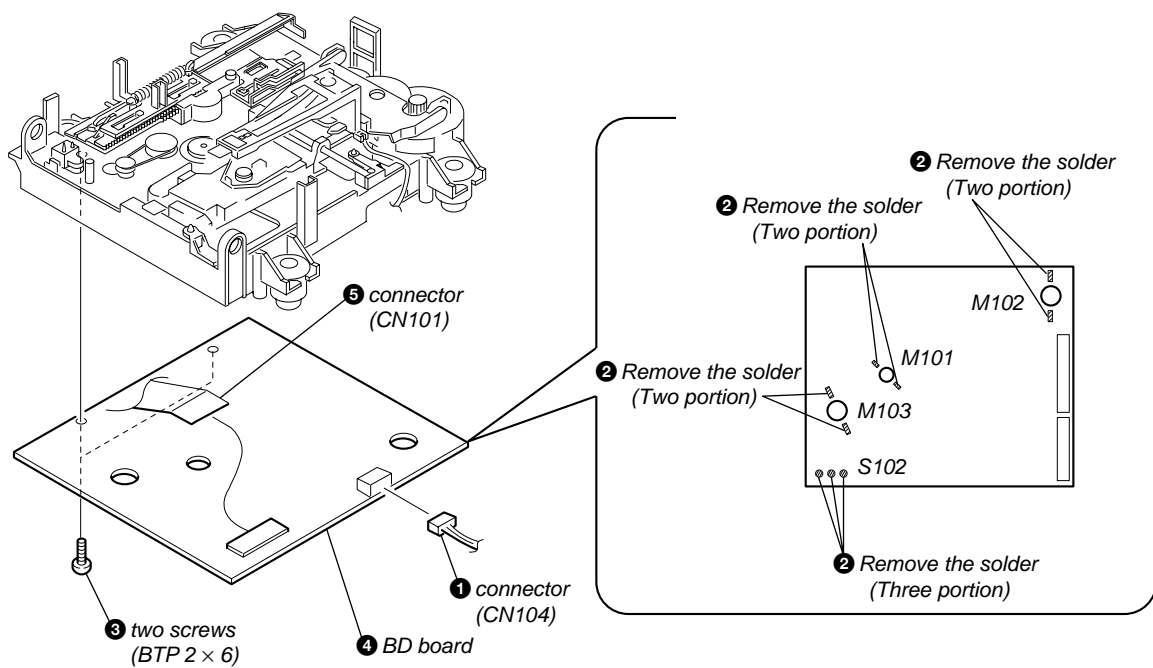
3-4. PT BOARD, VOL-SEL BOARD



3-5. MECHANISM DECK SECTION (MDM-7A)



3-6. 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 **[EJECT]** button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Be sure to press the **[EJECT]** button after pressing the **[MENU/NO]** button and the rotation of disc is stopped.

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

- Continuous recording mode (CREC 1MODE)
- 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 **[REC]** button.

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: While pressing the **[AMS]** knob and **[]** button, connect the power plug to an outlet, and release the **[AMS]** knob and **[]** button.
When the test mode is set, “[Check]” will be displayed. Rotating the **[AMS]** knob switches between the following three groups;
... ↔ Check ↔ Service ↔ Develop ↔ ...

Procedure 2: While pressing the **[AMS]** knob, connect the power plug to the outlet and release the **[AMS]** knob.
When the test mode is set, “TEMP CHECK” will be displayed. By setting the test mode using this method, only the “Check” group of method 1 can be executed.

NOTE: Do not use the test mode in the [Develop] group.
If used, the unit may not operate normally.

If the [Develop] group is set accidentally, press the **[MENU/NO]** button immediately to exit the [Develop] group.

4-3. EXITING THE TEST MODE

Press the **[REPEAT]** button. The disc is ejected when loaded, and “Standby” display blinks, and the STANDBY state is set.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the **[AMS]** knob, **[YES]** button, and **[MENU/NO]** button.
The functions of these buttons are as follows.

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

4-5. SELECTING THE TEST MODE

There are 25 types of test modes as shown below. The groups can be switched by rotating the [AMS] knob. After selecting the group to be used, press the [YES] button. After setting a certain group, rotating the [AMS] knob switches between these modes.

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

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

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

If used, the unit may not operate normally.

If the [Develop] group is set accidentally, press the [MENU/NO] button immediately to exit the [Develop] group.

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

- For details of each adjustment mode, refer to “5. Electrical Adjustments”.
For details of “Err Display”, refer to “Self-Diagnosis Function” on page 2.
- If a different mode has been selected by mistake, press the [MENU/NO] 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 [MENU/NO] button to exit the mode immediately.

4-5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
 - ① Set the disc in the unit. (Whichever recordable discs or discs for playback only are available.)
 - ② Rotate the **[AMS]** knob and display “CPLAY1 MODE”(C34).
 - ③ Press the **[YES]** button to change the display to “CPLAY1 MID”.
 - ④ When access completes, the display changes to “C = [] AD = []”.

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

2. Changing the parts to be played back
 - ① Press the **[YES]** button during continuous playback to change the display as below.

“CPLAY1 MID” → “CPLAY1 OUT” → “CPLAY1 IN”

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

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

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

3. Ending the continuous playback mode
 - ① Press the **[MENU/NO]** button. The display will change to “CPLAY1 MODE”(C34).
 - ② Press the **[EJECT]** button to remove the disc.

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

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

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

1. Entering the continuous recording mode
 - ① Set a recordable disc in the unit.
 - ② Rotate the **[AMS]** knob and display “CREC1 MODE” (C35).
 - ③ Press the **[YES]** button to change the display to “CREC1 MID”.
 - ④ When access completes, the display changes to “CREC1 ([])” and **REC** lights up.

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

2. Changing the parts to be recorded
 - ① When the **[YES]** button is pressed during continuous recording, the display changes as below.

“CREC1 MID” → “CREC1 OUT” → “CREC1 IN”

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

- ② When access completes, the display changes to “CREC1 ([])” and **REC** lights up.

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

3. Ending the continuous recording mode
 - ① Press the **[MENU/NO]** button. The display changes to “CREC1 MODE” (C35) and **REC** goes off.
 - ② Press the **[EJECT]** button to remove the disc.

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

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

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

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

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

4-6. FUNCTIONS OF OTHER BUTTONS

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

4-7. TEST MODE DISPLAYS

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

When CPLAY and CREC are started, the display will forcibly be switched to the error rate display as the initial mode.

1. Mode display

Displays “TEMP ADJUST”, “CPLAY1MODE”, etc.

2. Error rate display

Displays the error rate in the following way.

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)

If the [LEVEL/DISPLAY/CHAR] button is pressed after pressing the

[PROGRAM] button, the display switches from groove to pit or vice versa.

h = □□□□ s = □□□□ (MO pit and CD)

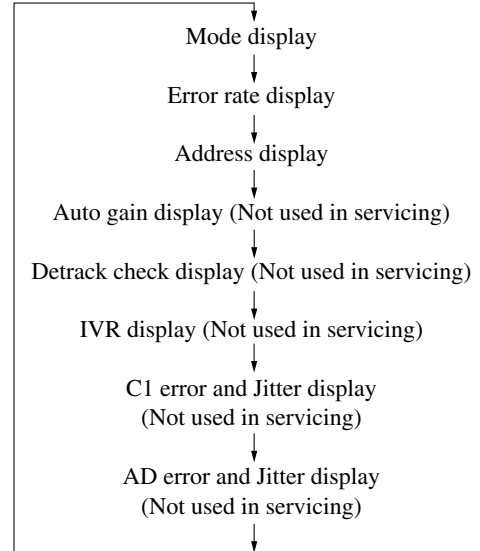
h = □□□□ a = □□□□ (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

Note: “-” is displayed when the address cannot be read.



4-8. MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
▷	Servo ON	Servo OFF
	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
SYNC	CLV low speed mode	CLV normal mode
L.SYNC	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
B/I	Tracking auto gain OK	
A-/REP	Focus auto gain OK	
TRACK/(LP) 4/Calendar frame	Pit	Groove
DISC/LP2	High reflection	Low reflection
SLEEP/SHUF	CLV S	CLV A
MONO	CLV LOCK	CLV UNLOCK

4-9. AUTOMATIC SELF-DIAGNOSIS FUNCTION

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

Procedure

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

When “CHECK ALL OK” is displayed, it means that the optical pick-up is normal. Check the operations of the other spindle motor, thread motor, etc.

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

4-10. INFORMATION

Display the software version.

Procedure

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

4-11. WHEN MEMORY NG IS DISPLAYED

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

Procedure

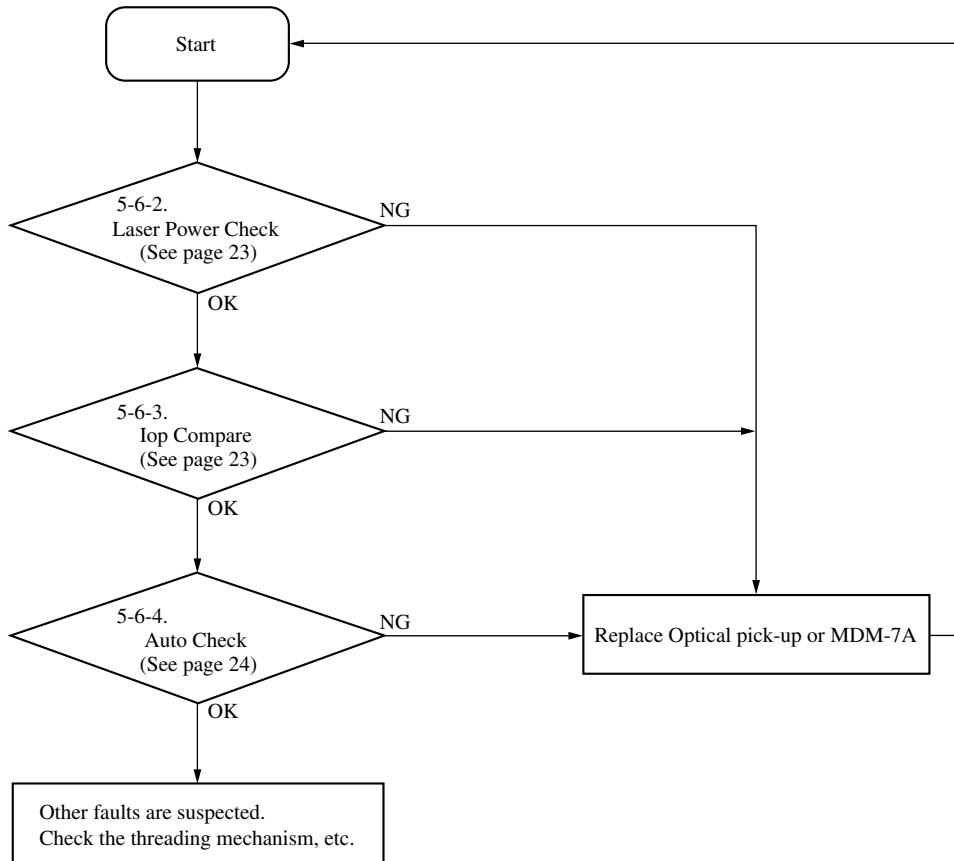
1. Set the test mode. (Refer to 4-2.)
2. Normally a message for selecting the test mode will be displayed. However if the nonvolatile memory is abnormal, the following will be displayed. “INIT EEP?”
3. Press the STOP button and EJECT button together.
4. Rotate the AMS knob and select MDM-7A.
5. Press the AMS knob. If the nonvolatile memory is successfully overwritten, the normal test mode will be set and a message to select the test mode will be displayed.

SECTION 5 ELECTRICAL ADJUSTMENTS

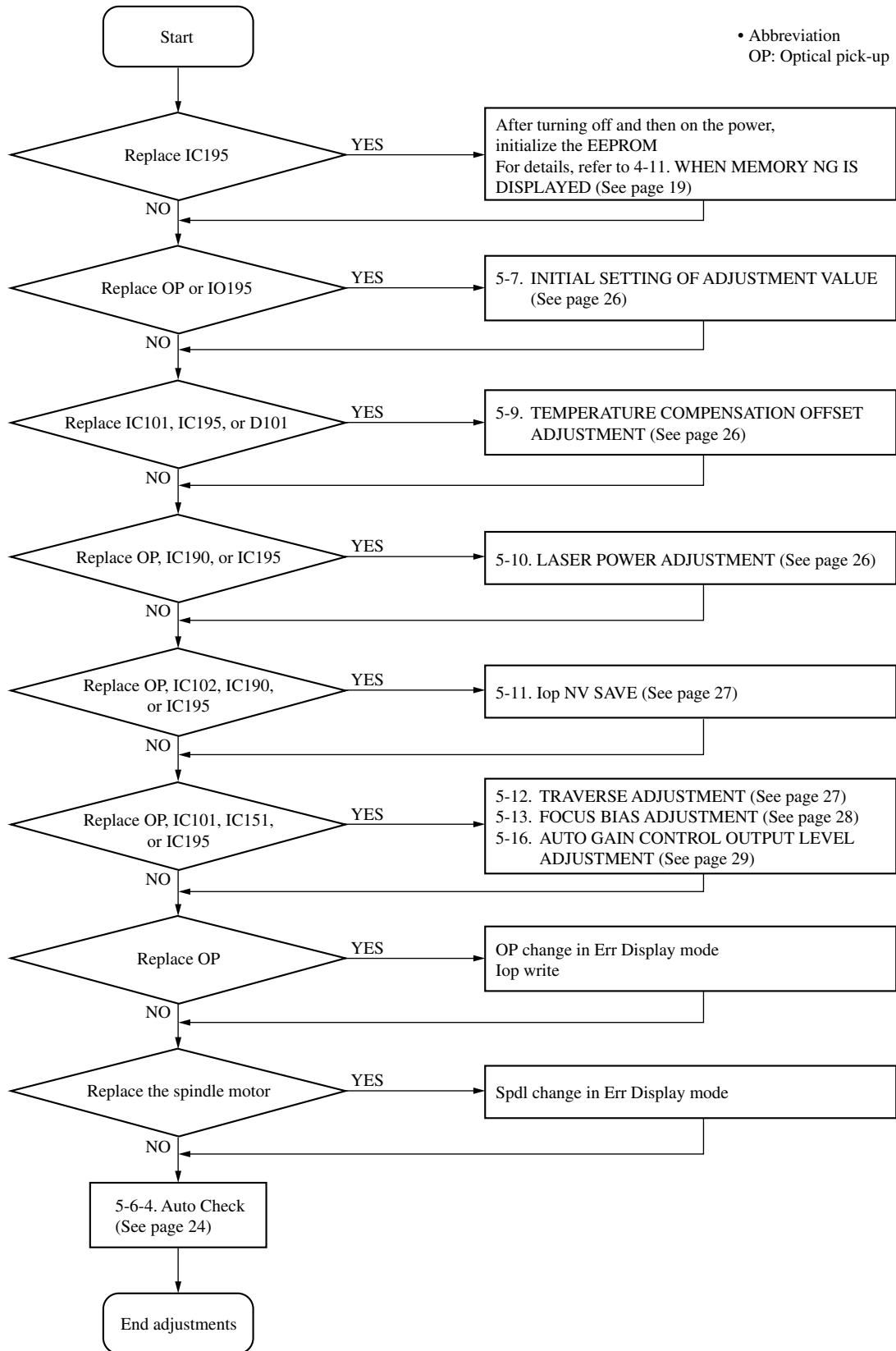
5-1. PARTS REPLACEMENT AND ADJUSTMENT

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

Check before replacement



Adjustment flow

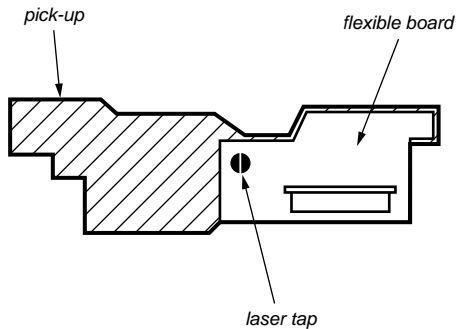


5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

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-260B)

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 6.)
- 7) As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

Adjustment	Parts to be replaced						
	Optical Pick-up	IC101	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. Rotate the [AMS] knob and display "CREC1 MODE".
3. Press the [YES] button again to display "CREC1 MID".
Display "CREC (0300)" and start to recording.
4. Complete recording within 5 minutes.
5. Press the [MENU/NO] button and stop recording .
6. Press the [EJECT] button and remove the disc.

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

Note :

- Be careful not to apply vibration during continuous recording.

5-6. CHECKS PRIOR TO REPAIRS

These checks are performed before replacing parts according to "approximate specifications" to determine the faulty locations. For details, refer to "Checks Prior to Parts Replacement and Adjustments" (See page 8).

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.

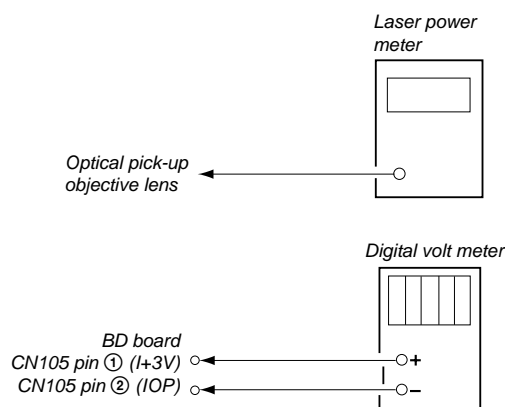
Checking Procedure:

1. Rotate the [AMS] knob to display "TEMP CHECK".
2. Press the [YES] button.
3. "T=@@ (##) [OK]" should be displayed. If "T=@@ (##) [NG]" is displayed, it means that the results are bad.
(@@ indicates the current value set, and ## indicates the value written in the non-volatile memory.)

5-6-2. Laser Power Check

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

Connection :



Checking Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀] button or [▶] button to move the optical pick-up.)
Connect the digital volt meter to CN105 pin ① (I+3V) and CN105 pin ② (IOP).
2. Then, rotate the [AMS] knob and display "LDPWR CHECK".
3. Press the [YES] button once and display "LD 0.9 mW \$ []".
Check that the reading of the laser power meter become 0.84 to 0.92 mW.
4. Press the [YES] 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 ± 10%

(Optical pick-up label)

KMS260B
20101
H0576

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

Iop = 57.6 mA in this case

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

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

Note 1: After step 4, each time the [YES] button is pressed, the display will be switched between "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. Rotate the [AMS] knob to display "Iop Compare".
2. Press the [YES] button and start measurements.
3. When measurements complete, the display changes to "±xx%yy".
xx is the percentage of increase/decrease, and OK or NG is displayed at yy to indicate whether the percentage of increase/decrease is within the allowable range.
4. Press the [MENU/NO] button to end.

5-6-4. Auto Check

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

Procedure

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

When “CHECK ALL OK” is displayed, it means that the optical pick-up is normal. Check the operations of the other spindle motor, thread motor, etc.

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

5-6-5. Other Checks

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

5-6-6. Traverse Check

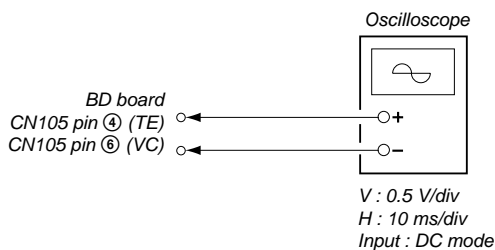
5-6-7. Focus Bias Check

5-6-8. C PLAY Check

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

5-6-6. Traverse Check

Connection :

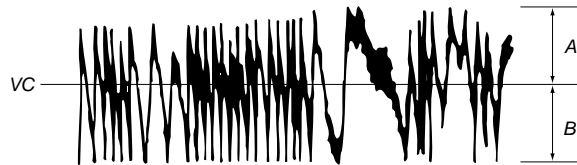


Checking Procedure:

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. Rotate the **[AMS]** knob and display “EF MO CHECK”.
5. Press the **[YES]** button and display “EFB = **[MO-R]**”.
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)

6. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the **[AMS]** knob.
(Read power traverse checking)

(Traverse Waveform)

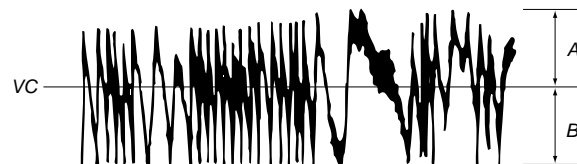


Specified value : Below 10% offset value

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

7. Press the **[YES]** button and display “EFB = **[MO-W]**”.
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the **[AMS]** knob.
(Write power traverse checking)

(Traverse Waveform)

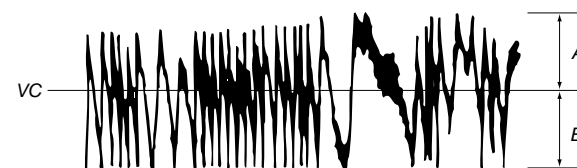


Specified value : Below 10% offset value

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

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

(Traverse Waveform)



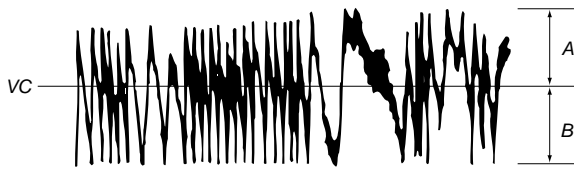
Specified value : Below 10% offset value

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

11. Press the **[YES]** button display “EF MO CHECK”
The disc stops rotating automatically.
12. Press the **[⏏]** button and remove the disc.
13. Load the check disc (MD) TDYS-1.
14. Rotate the **[AMS]** knob and display “EF CD CHECK” (C04).
15. Press the **[YES]** button and display “EFB = **[CD]**”. Servo is imposed automatically.

- Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the **[AMS]** knob.

(Traverse Waveform)



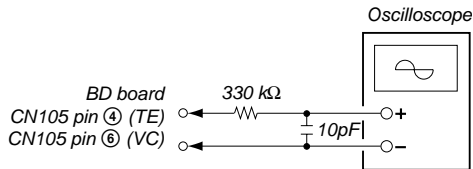
Specified value : Below 10% offset value

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

- Press the **[YES]** 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”.)
- Rotate the **[AMS]** knob and display “CPLAY1 MODE”.
- Press the **[YES]** button and display “CPLAY1 MID”.
- Press the **[MENU/NO]** button when “C = [] AD = []” is displayed.
- Rotate the **[AMS]** knob and display “FBIAS CHECK”.
- Press the **[YES]** 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 **[YES]** button and display “[]/[] b = []”.
Check that the C1 error is below 100 and ADER is below 2.
- Press the **[YES]** button and display “[]/[] a = []”.
Check that the C1 error is below 100 and ADER is below 2.
- Press the **[MENU/NO]** 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”.)
- Rotate the **[AMS]** knob and display “CPLAY1 MODE”.
- Press the **[YES]** button and display “CPLAY1 MID”.
- The display changes to “C1 = [] AD = []”.
- If the C1 error rate is below 20, check that ADER is 00.
- Press the **[MENU/NO]** button, stop playback, press the **[⇐]** button, and test disc.

CD Error Rate Check

Checking Procedure :

- Load a check disc (MD) TDYS-1.
- Rotate the **[AMS]** knob and display “CPLAY1 MODE”.
- Press the **[YES]** button twice and display “CPLAY1 MID”.
- The display changes to “C1 = [] AD = []”.
- Check that the C1 error rate is below 20.
- Press the **[MENU/NO]** 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.
- Rotate the **[AMS]** knob to display “CREC1 MODE”.
- Press the **[YES]** button to display the “CREC1 MID”.
- When recording starts, “**REC**” is displayed, this becomes “CREC (@@@@)” (@@@@ is the address), and recording starts.
- About 1 minute later, press the **[MENU/NO]** button to stop continuous recording.
- Rotate the **[AMS]** knob to display “C PLAY1 MODE”.
- Press the **[YES]** button to display “C PLAY1 MID”.
- “C1 = [] AD = []” will be displayed.
- Check that the C1 error becomes below 20 and the AD error below 2.
- Press the **[MENU/NO]** 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 on Adjustments” and execute the initial setting before the adjustment as required.

Setting Procedure :

1. Rotate the [AMS] knob to display “ADJ CLEAR”.
2. Press the [YES] button. “Complete!” will be displayed momentarily and initial setting will be executed, after which “ADJ CLEAR” will be displayed.

5-8. RECORDING AND DISPLAYING THE Iop INFORMATION

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

Recording Procedure :

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

Display Procedure :

1. Rotate the [AMS] knob to display “Iop.Read”.
2. “@@.@/##.#” is displayed and the recorded contents are displayed.
@@.@ indicates the Iop value labeled on the pick-up.
##.# indicates the Iop value after adjustment
3. To end, press the [AMS] button or [MENU/NO] button to display “Iop Read”.

5-9. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

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

Note :

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

Adjusting Procedure :

1. Rotate the [AMS] knob and display “TEMP ADJUST”.
2. Press the [YES] button and select the “TEMP ADJUST” mode.
3. “TEMP = [] [OK]” and the current temperature data will be displayed.
4. To save the data, press the [YES] button.
When not saving the data, press the [MENU/NO] button.
5. When the [YES] button is pressed, “TEMP = [] SAVE” will be displayed and turned back to “TEMP ADJUST” display then.
When the [MENU/NO] button is pressed, “TEMP ADJUST” will be displayed immediately.

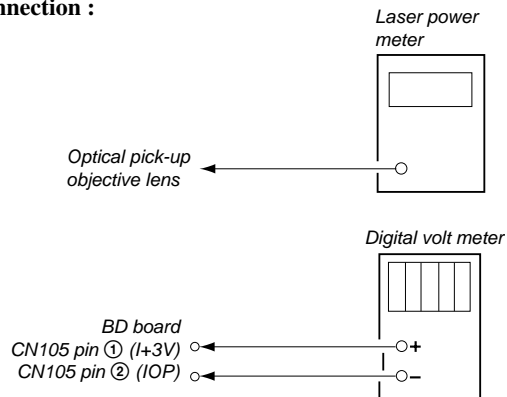
Specified Value :

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 Iop Information.)

Connection :



Adjusting Procedure :

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀] button or [▶] button to move the optical pick-up.)
Connect the digital volt meter to CN105 pin ① (I+3V) and CN105 pin ② (IOP).
2. Rotate the [AMS] knob and display “LDPWR ADJUST”.
(Laser power : For adjustment)
3. Press the [YES] button once and display “LD 0.9 mW \$ []”.
4. Rotate the [AMS] knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the [YES] button after setting the range knob of the laser power meter, and save the adjustment results. (“LD SAVE \$ []” will be displayed for a moment.)
5. Then “LD 7.0 mW \$ []” will be displayed.
6. Rotate the [AMS] knob so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the [YES] button and save it.

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

- Then, rotate the **AMS** knob and display "LDPWR CHECK".
- Press the **YES** 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 **YES** 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)

KMS260B
20101
H0576

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

$I_{op} = 57.6$ mA in this case

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

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

Note 1: After step 4, each time the **YES** button is pressed, the display will be switched 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.

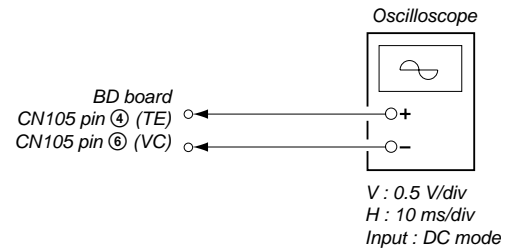
Note: Perform this function with the optical pick-up set at room temperature.

Procedure

- Rotate the **AMS** knob to display "Iop NV Save" (C06).
- Press the **YES** button and display "Iop [stop]".
- After the display changes to "Iop =xxsave?", press the **YES** button.
- After "Complete!" is displayed momentarily, the display changes to "Iop 7.0 mW".
- After the display changes to "Iop=yysave?", press the **YES** button.
- When "Complete!" is displayed, it means that Iop NV saving has been completed.

5-12. TRAVERSE ADJUSTMENT

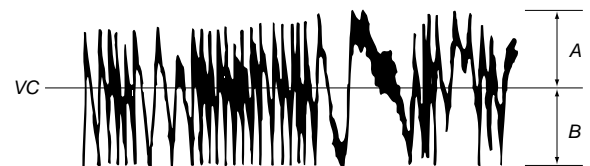
Connection :



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.
- Rotate the **AMS** knob and display "EF MO ADJUST".
- Press the **YES** button and display "EFB = [] MO-R".
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
- Rotate the **AMS** knob so that the waveform of the oscilloscope becomes the specified value.
(When the **AMS** knob is rotated, the [] of "EFB = []" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Read power traverse adjustment)

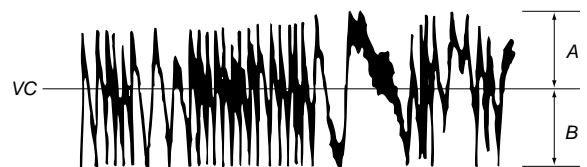
(Traverse Waveform)



Specification A = B

- Press the **YES** button and save the result of adjustment to the non-volatile memory ("EFB = [] SAVE" will be displayed for a moment. Then "EFB = [] MO-W" will be displayed).
- Rotate the **AMS** knob so that the waveform of the oscilloscope becomes the specified value.
(When the **AMS** knob is rotated, the [] of "EFB = [] MO-W" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Write power traverse adjustment)

(Traverse Waveform)

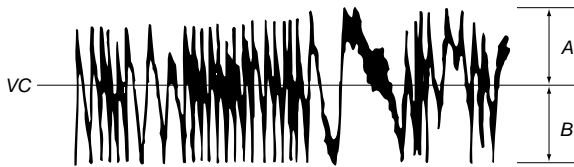


Specification A = B

- Press the **YES** button, and save the adjustment results in the 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.

- Rotate the **[AMS]** knob until the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

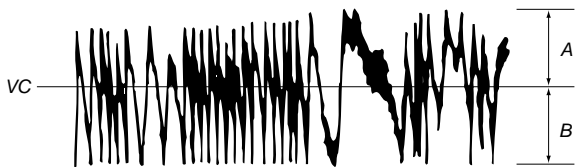
(Traverse Waveform)



Specification $A = B$

- Press the **[YES]** button, and save the adjustment results in the non-volatile memory. (“EFB = **[]** SAVE” will be displayed for a moment.)
Next “EF MO ADJUS” is displayed. The disc stops rotating automatically.
- Press the **[]** button and remove the disc.
- Load the check disc (MD) TDYS-1.
- Rotate **[AMS]** knob and display “EF CD ADJUS”.
- Press the **[YES]** button and display “EFB = **[]** CD”. Servo is imposed automatically.
- Rotate the **[AMS]** knob so that the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)

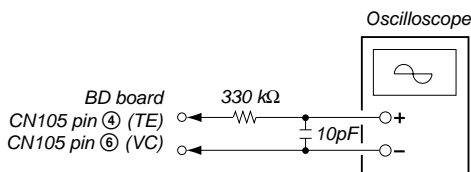


Specification $A = B$

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



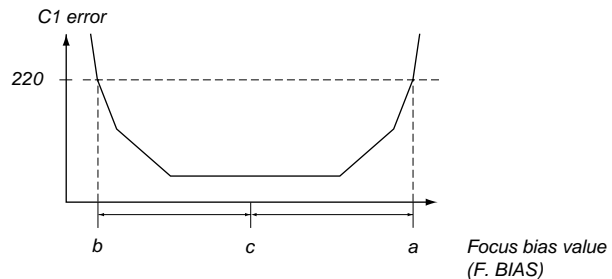
5-13. FOCUS BIAS ADJUSTMENT

Adjusting Procedure :

- Load a test disk (MDW-74/GA-1).
- Rotate the **[AMS]** knob and display “CPLAY1 MODE”.
- Press the **[YES]** button and display “CPLAY1 MID”.
- Press the **[MENU/NO]** button when “C1 = **[]** AD = **[]**” is displayed.
- Rotate the **[AMS]** knob and display “FBIAS ADJUST”.
- Press the **[YES]** 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.
- Rotate the **[AMS]** knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220 (Refer to Note 2).
- Press the **[YES]** button and display “**[]** b = **[]**”.
- Rotate the **[AMS]** knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
- Press the **[YES]** button and display “**[]** c = **[]**”.
- Check that the C1 error rate is below 20 and ADER is 00. Then press the **[YES]** button.
- If the “(**[]** ” in “**[]** - **[]** - **[]** (**[]** ” is above 20, press the **[YES]** button.
If below 20, press the **[MENU/NO]** button and repeat the adjustment from step 2.
- 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. Rotate the [AMS] knob and display "CPLAY1 MODE".
3. Press the [YES] button twice and display "CPLAY1 MID".
4. The display changes to "C1 = [] AD = []".
5. Check that the C1 error rate is below 20.
6. Press the [MENU/NO] 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. Rotate the [AMS] knob and display "CPLAY1 MODE".
3. Press the [YES] button and display "CPLAY1 MID".
4. The display changes to "C1 = [] AD = []".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the [MENU/NO] 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. Rotate the [AMS] knob and display "CPLAY1 MODE".
3. Press the [YES] button twice and display "CPLAY1 MID".
4. Press the [MENU/NO] button when "C1 = [] AD = []" is displayed.
5. Rotate the [AMS] knob and display "FBIAS CHECK".
6. Press the [YES] button and display "[]/[] c = []".
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADR, and the 2 digits after [c =] indicate the focus bias value.
Check that the C1 error is below 20 and ADER is below 2.
7. Press the [YES] button and display "[]/[] b = []".
Check that the C1 error is below 100 and ADER is below 2.
8. Press the [YES] button and display "[]/[] a = []".
Check that the C1 error is below 100 and ADER is below 2
9. Press the [MENU/NO] 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. Rotate the [AMS] knob to display "AG Set (CD)".
3. When the [YES] button is pressed, the adjustment will be performed automatically.
"Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (CD)".
4. Press the [] button to remove the disc.

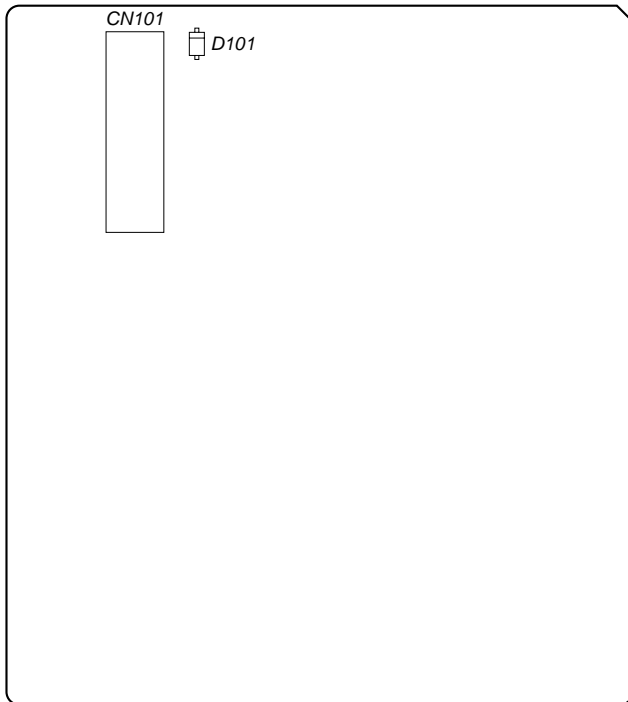
5-16-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :

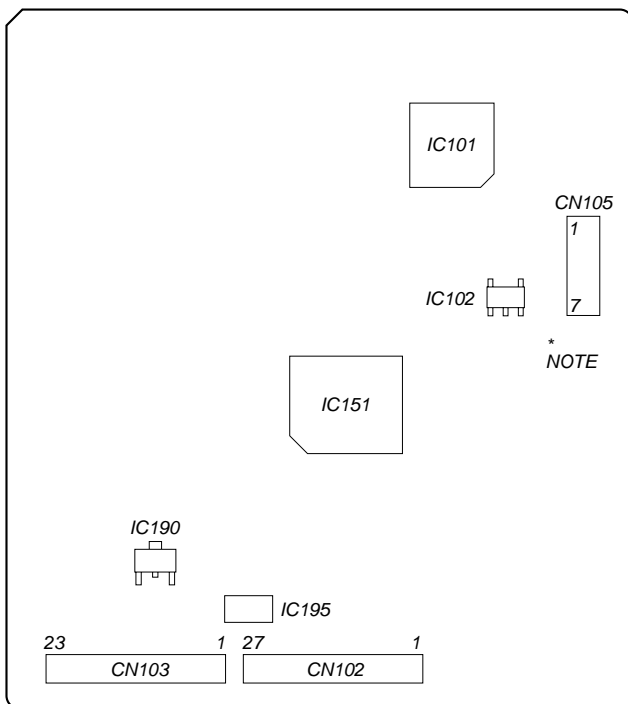
1. Insert the reference disc (MDW-74/GA-1) for recording.
2. Rotate the [AMS] knob to display "AG Set (MO)".
3. When the [YES] button is pressed, the adjustment will be performed automatically.
"Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after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

5-17. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



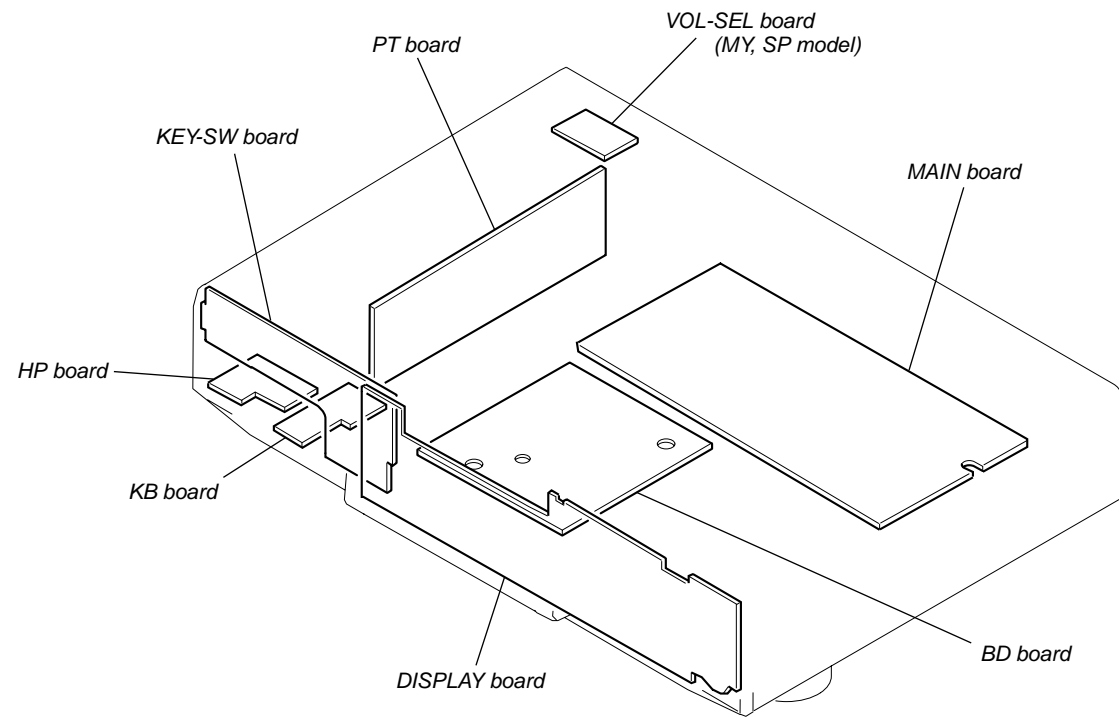
[BD BOARD] (SIDE B)



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

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.





Note:

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

-  : 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 $10\text{ M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
 -  : PB
 -  : REC
 -  : PB (DIGITAL OUT)
 -  : REC (DIGITAL IN)
- Abbreviation
 - CND : Canadian model
 - SP : Singapore model
 - MY : Malaysia model

For printed wiring boards.

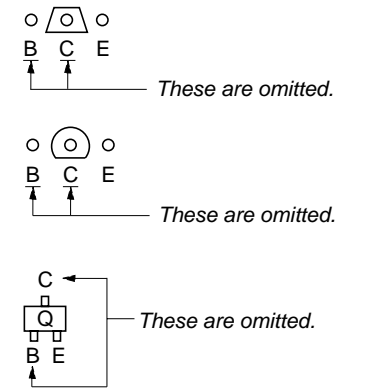
Note:

-  : 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.)

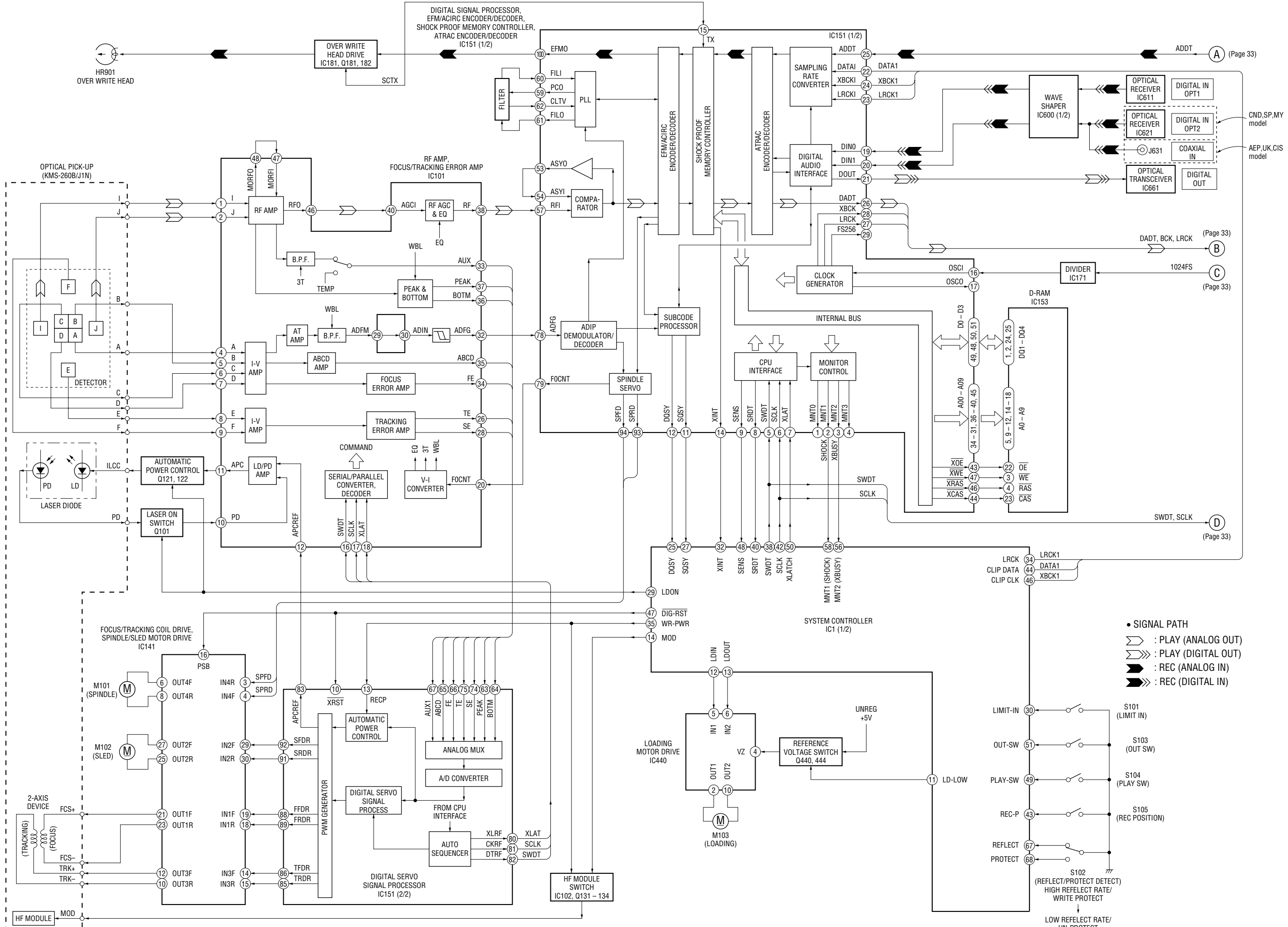
Caution:

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



6-2. BLOCK DIAGRAMS - BD SECTION -



(Page 33)

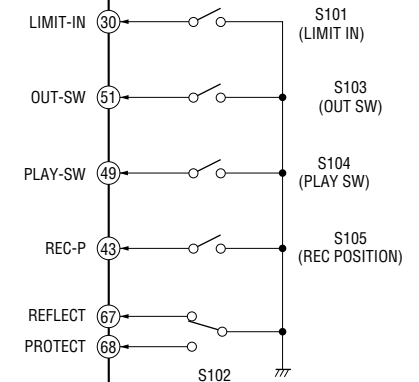
(Page 33)

(Page 33)

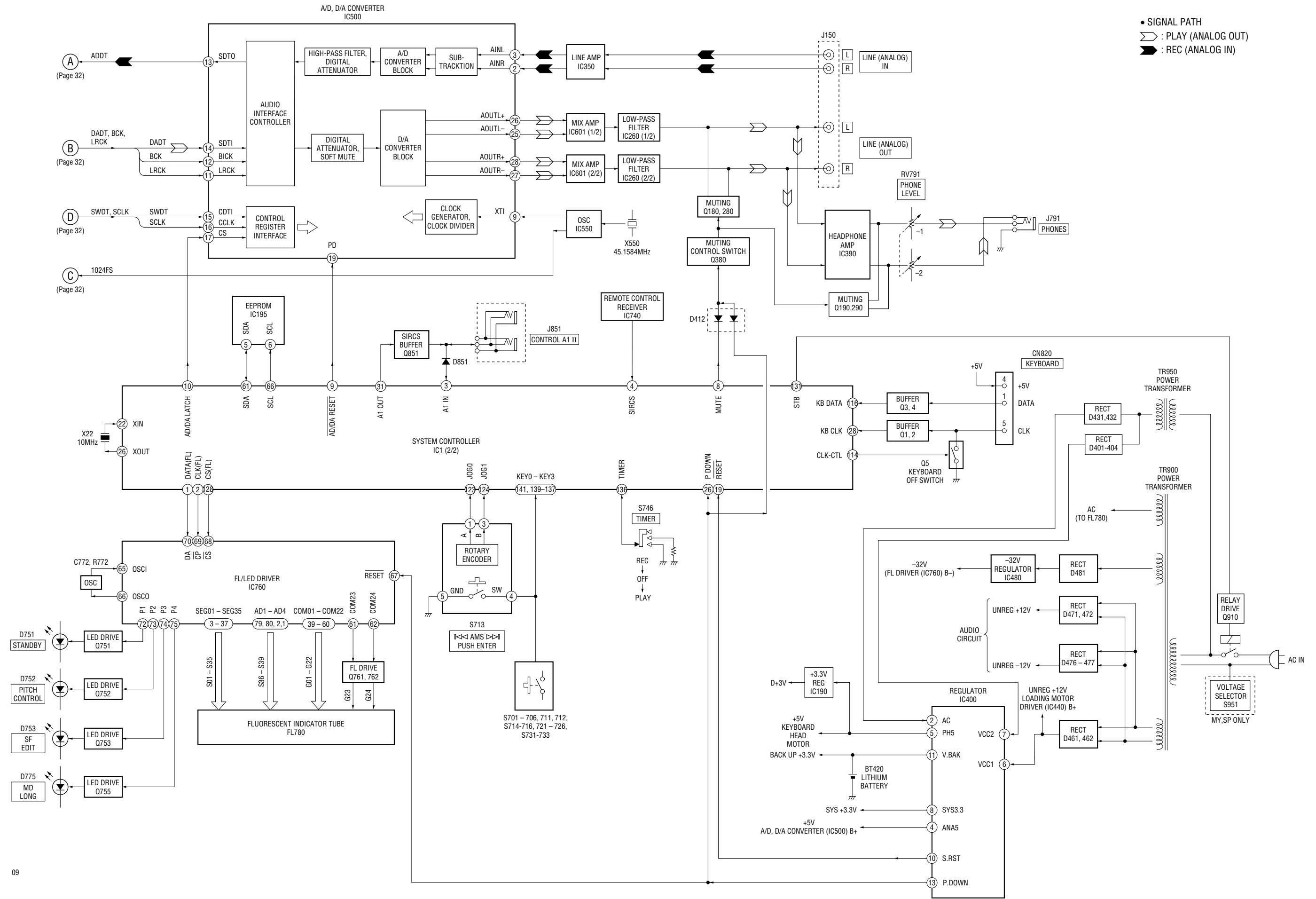
(Page 33)

CND,SP,MY model
AEP,UK,CIS model

- SIGNAL PATH
- Open arrow: PLAY (ANALOG OUT)
- Double arrow: PLAY (DIGITAL OUT)
- Single arrow with bar: REC (ANALOG IN)
- Double arrow with bar: REC (DIGITAL IN)

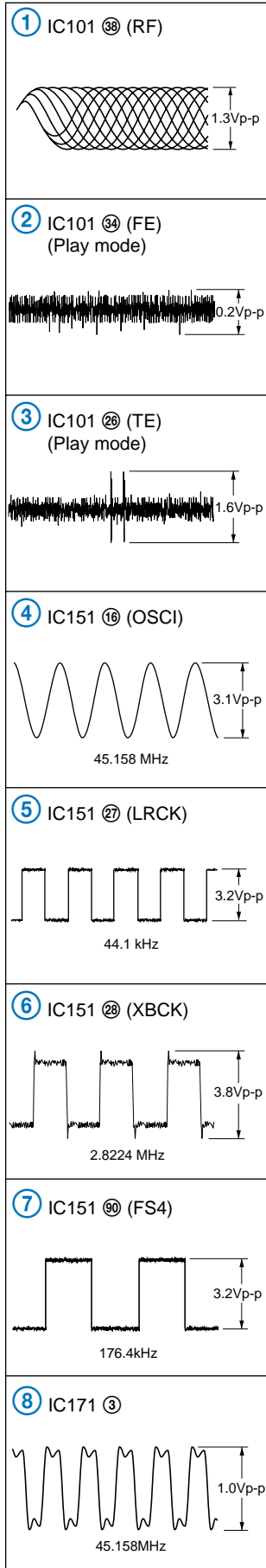


- MAIN SECTION -

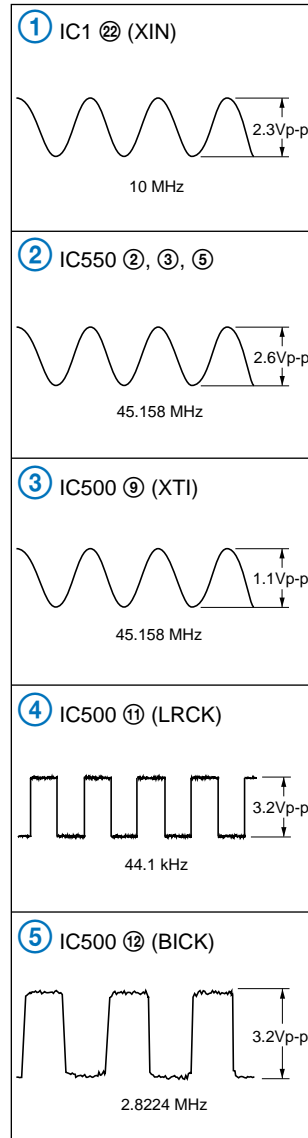


• WAVEFORMS

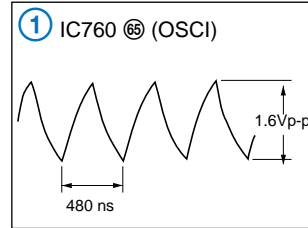
– BD Board –



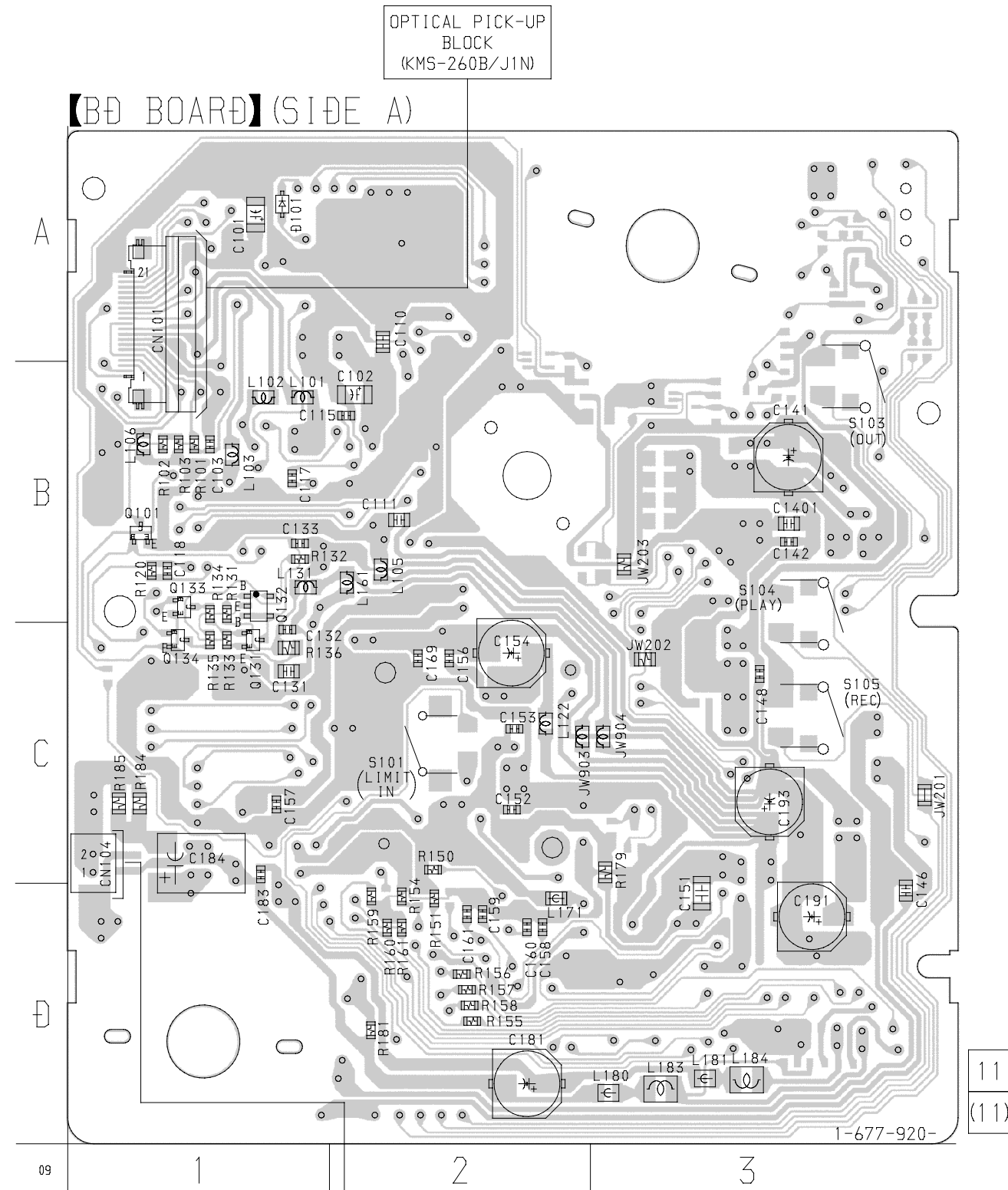
– MAIN Board –



– DISPLAY Board –



6-3. PRINTED WIRING BOARD – BD SECTION –

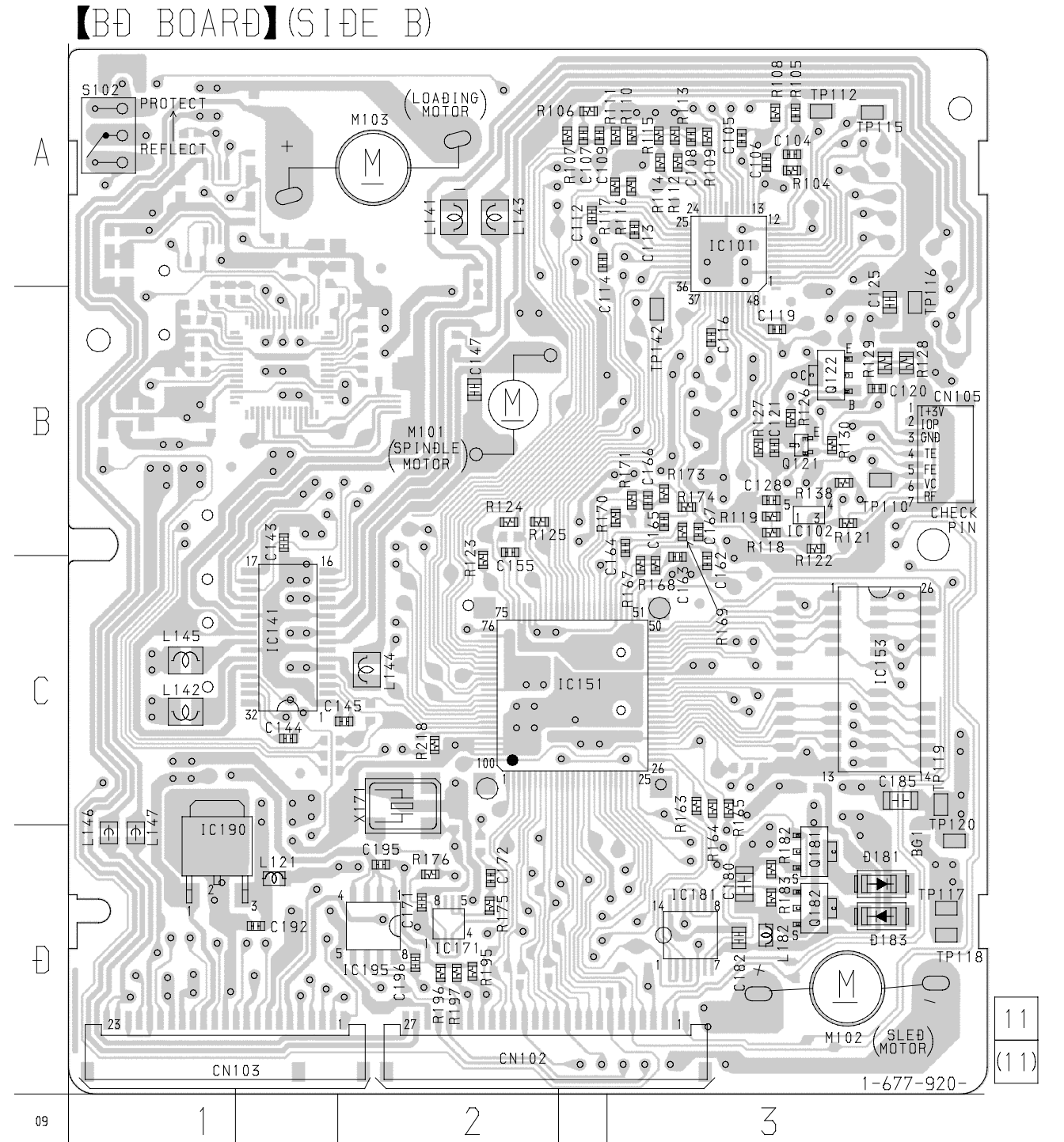


• Semiconductor Location

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

HR901
OVER
WRITE HEAD

11
(11)



• Semiconductor Location

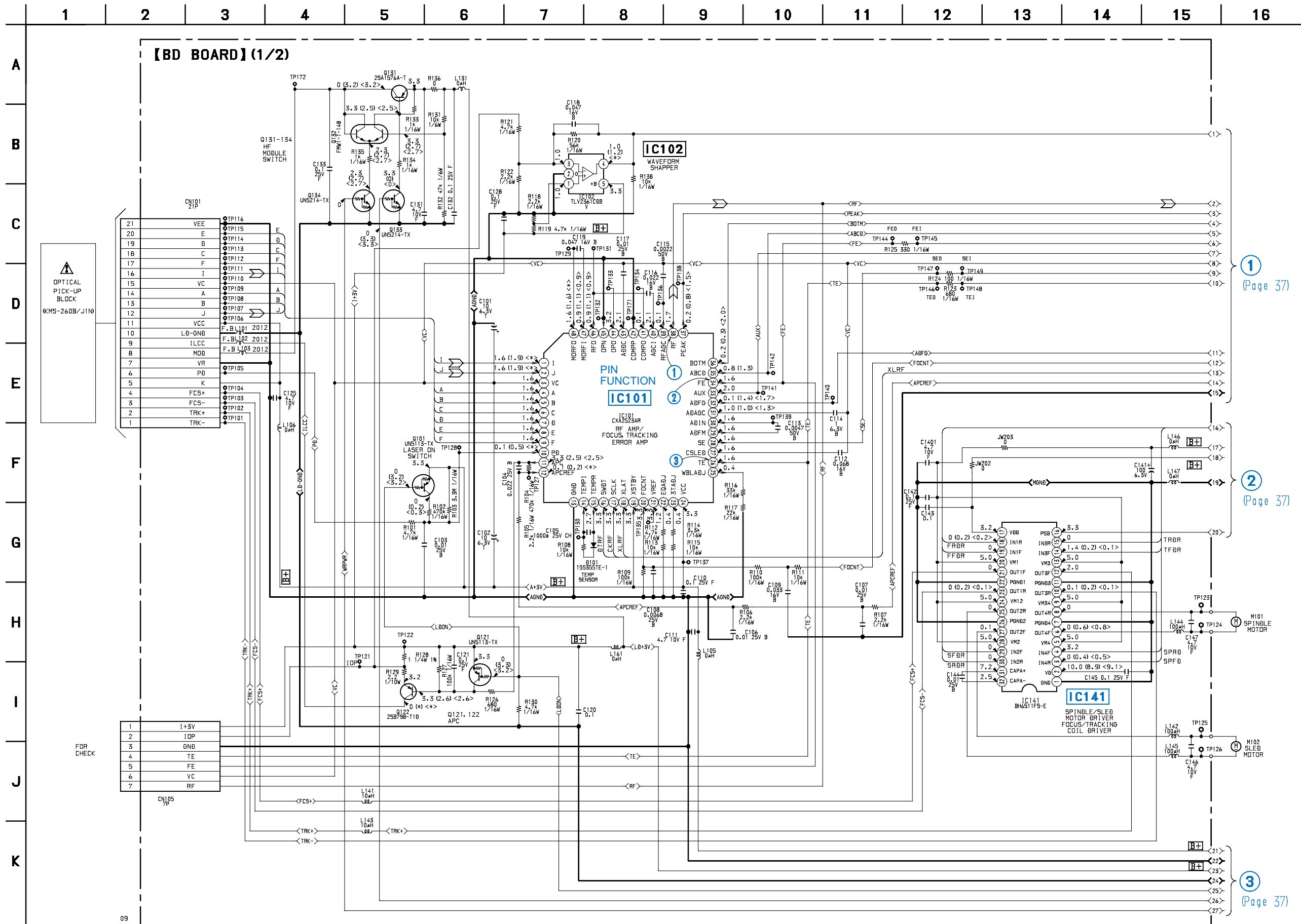
Ref. No.	Location	Ref. No.	Location
D181	D-3	IC181	D-3
D183	D-3	IC190	D-1
IC101	A-3	IC195	D-2
IC102	B-3	Q121	B-3
IC141	C-1	Q122	B-3
IC151	C-2	Q181	D-3
IC153	C-3	Q182	D-3
IC171	D-2		

(PAGE 39) B

(PAGE 39) A

11
(11)

6-4. SCHEMATIC DIAGRAM – BD SECTION (1/2) – • See page 34 for Waveforms. • See page 46 for IC Block Diagrams. • See page 48 for IC Pin Functions. • See page 35 for Printed Wiring Board.



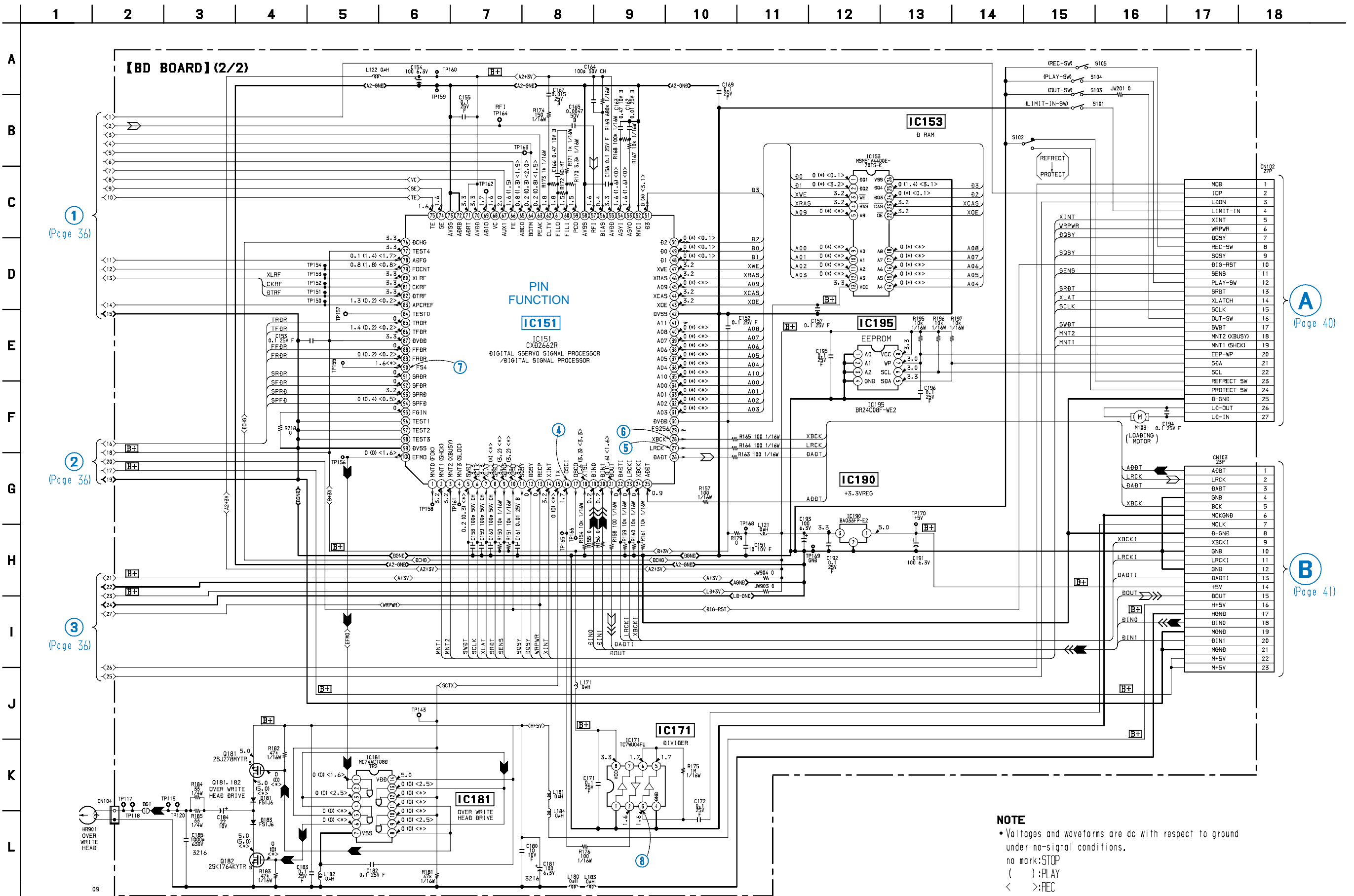
Note: The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

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

NOTE
 • Voltages and waveforms are dc with respect to ground under no-signal conditions.

no mark: STOP
 (): PLAY
 < >: REC
 * : can not be measured.

6-5. SCHEMATIC DIAGRAM – BD SECTION (2/2) – • See page 34 for Waveforms. • See page 46 for IC Block Diagrams. • See page 49 for IC Pin Functions. • See page 35 for Printed Wiring Board.



NOTE

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

1 (Page 36)

2 (Page 36)

3 (Page 36)

A (Page 40)

B (Page 41)

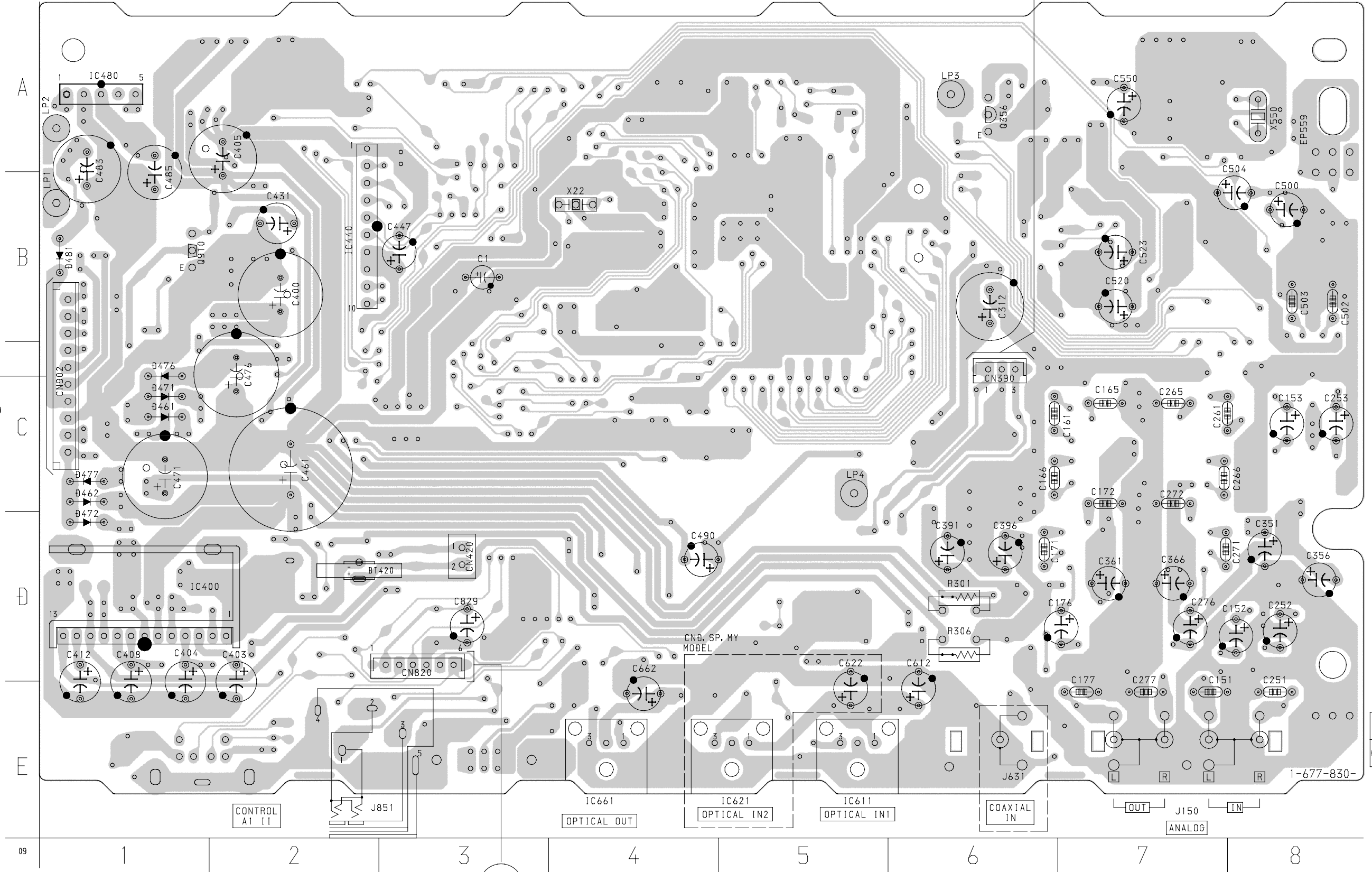
6-6. PRINTED WIRING BOARD – MAIN SECTION (SIDE A) –

【MAIN BOARD】(SIDE A)

(PAGE 44)

(PAGE 43)

(PAGE 44)

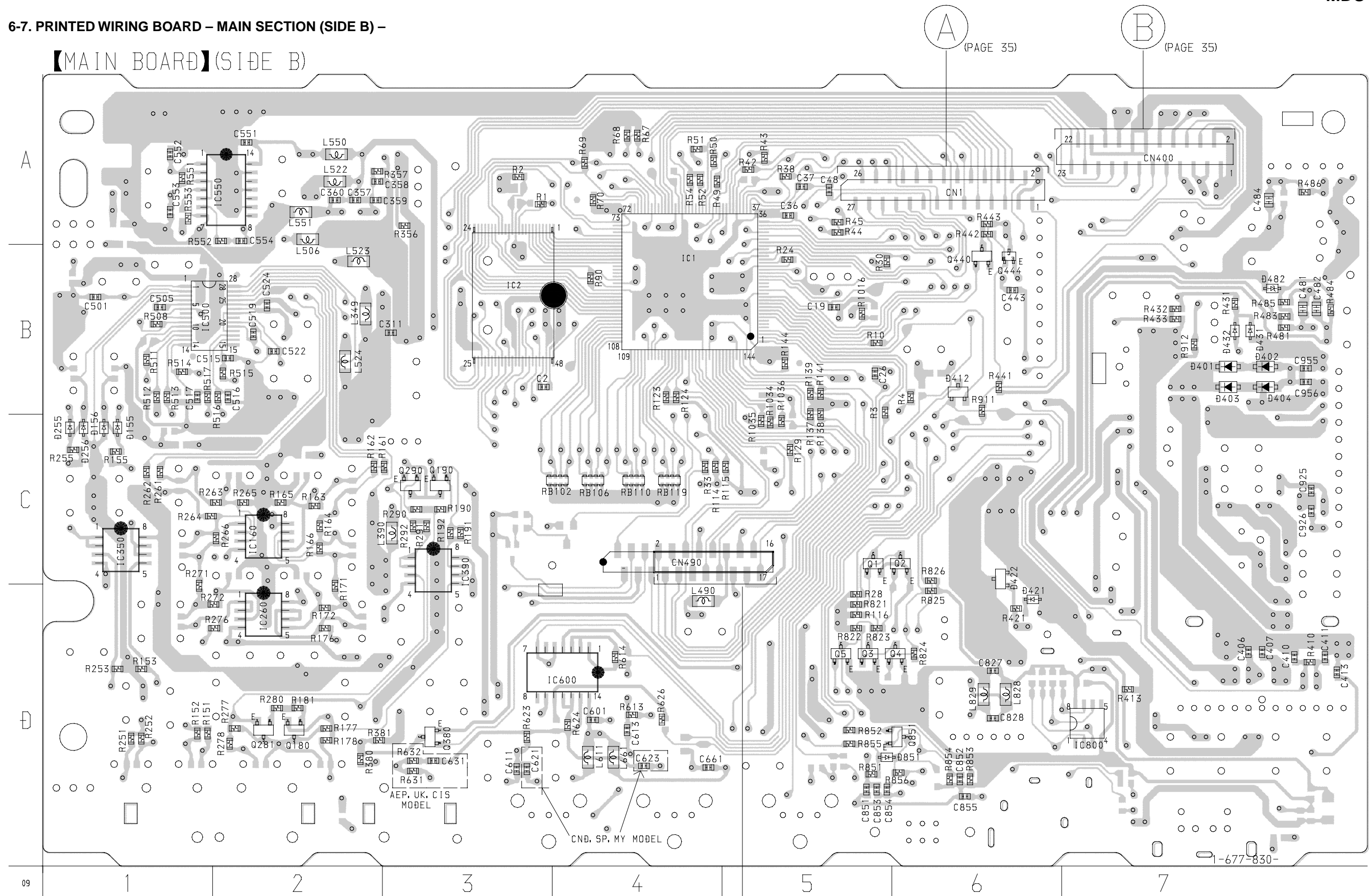


• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D461	C-1	IC440	B-2
D462	C-1	IC480	A-1
D471	C-1	IC611	E-5
D472	D-1	IC621	E-5
D476	C-1	IC661	E-4
D477	C-1	Q356	A-6
D481	B-1	Q910	B-1
IC400	D-1		

6-7. PRINTED WIRING BOARD – MAIN SECTION (SIDE B) –

【MAIN BOARD】(SIDE B)



(PAGE 35)

(PAGE 35)

(PAGE 44)

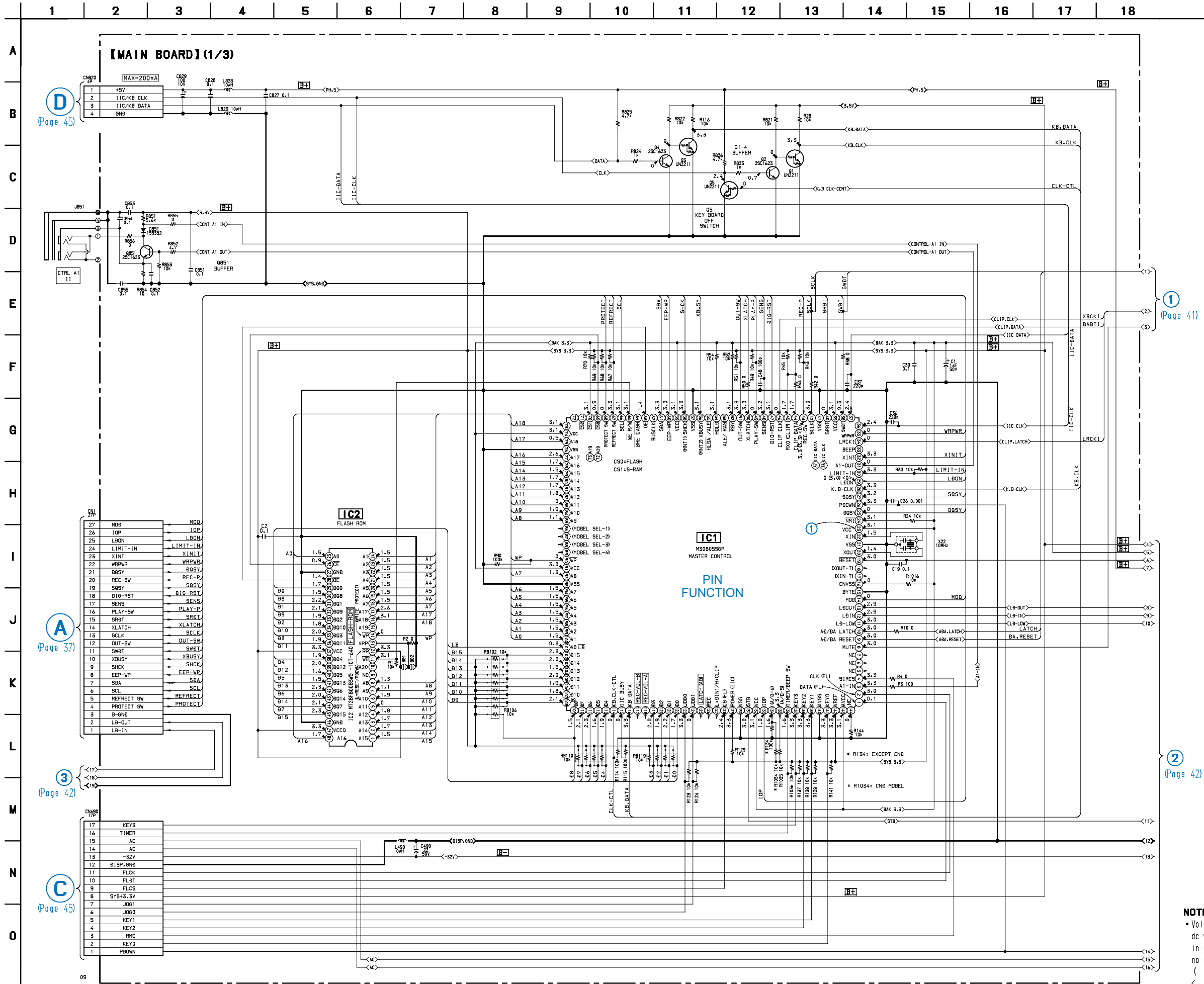
11
(11)

1-677-830-

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D155	C-1	D422	C-6	IC390	C-3	Q190	C-3
D156	C-1	D431	B-7	IC500	B-2	Q281	D-2
D255	C-1	D432	B-7	IC550	A-2	Q290	C-3
D256	C-1	D482	B-7	IC600	D-4	Q380	D-3
D401	B-7	D851	D-6	Q1	C-5	Q440	B-6
D402	B-7	IC1	B-4	Q2	C-6	Q444	B-6
D403	B-7	IC2	B-3	Q3	C-5	Q851	D-6
D404	B-7	IC160	C-2	Q4	C-6		
D412	B-6	IC260	D-2	Q5	C-5		
D421	C-6	IC350	C-1	Q180	D-2		

6-8. SCHEMATIC DIAGRAM – MAIN SECTION (1/3) – • See page 34 for Waveforms. • See page 52 for IC Pin Functions.



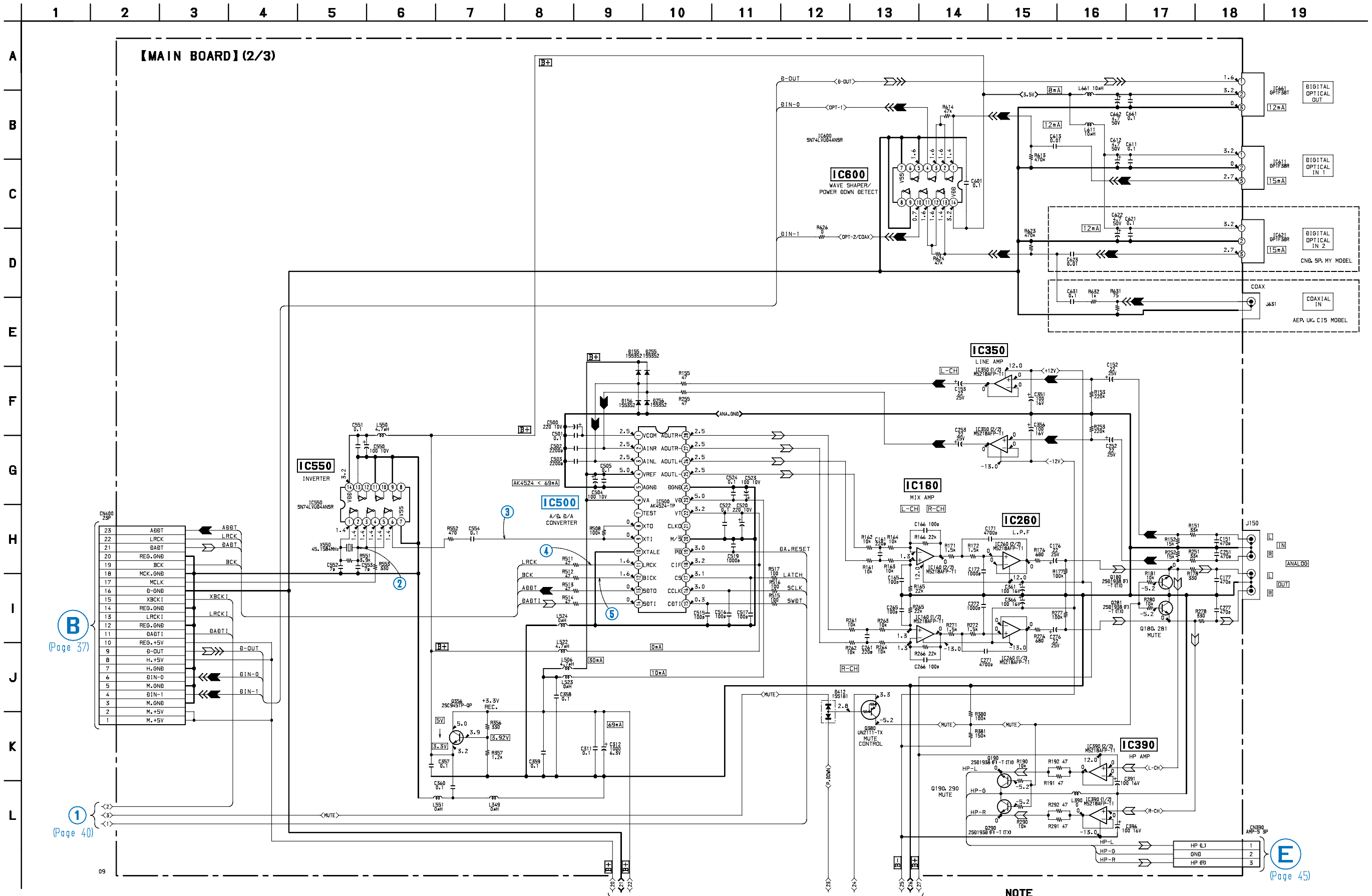
1 (Page 41)

2 (Page 42)

NOTE

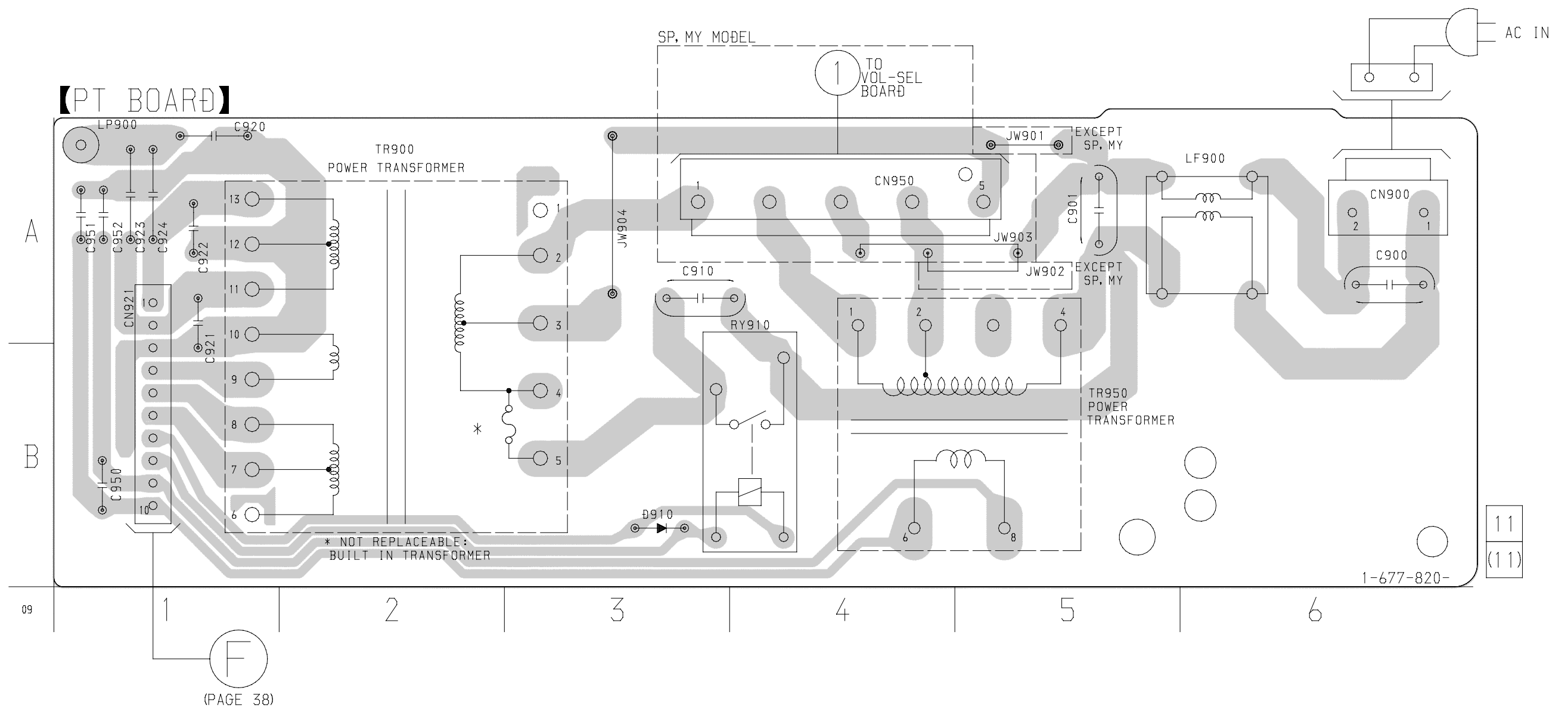
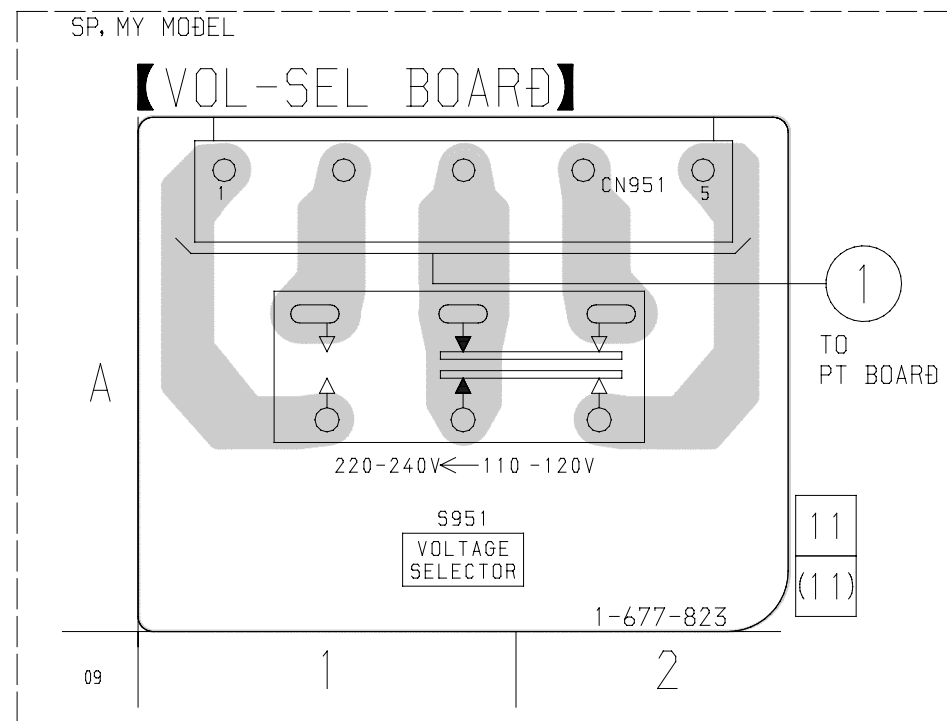
- Voltages and waveforms are dc with respect to ground in service mode.
- () :PLAY
- < > :REC

6-9. SCHEMATIC DIAGRAM – MAIN SECTION (2/3) – • See page 34 for Waveforms. • See page 47 for IC Block Diagrams.

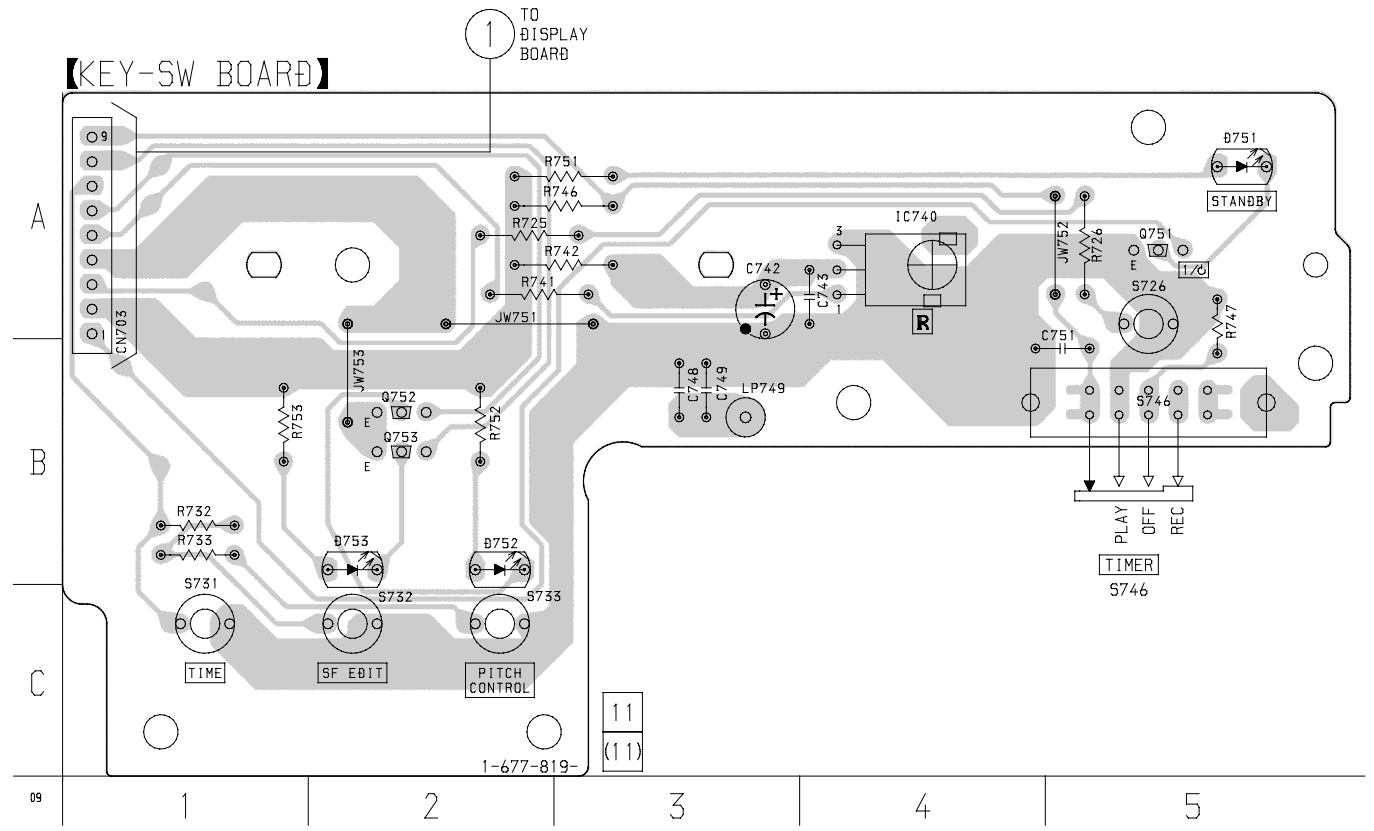
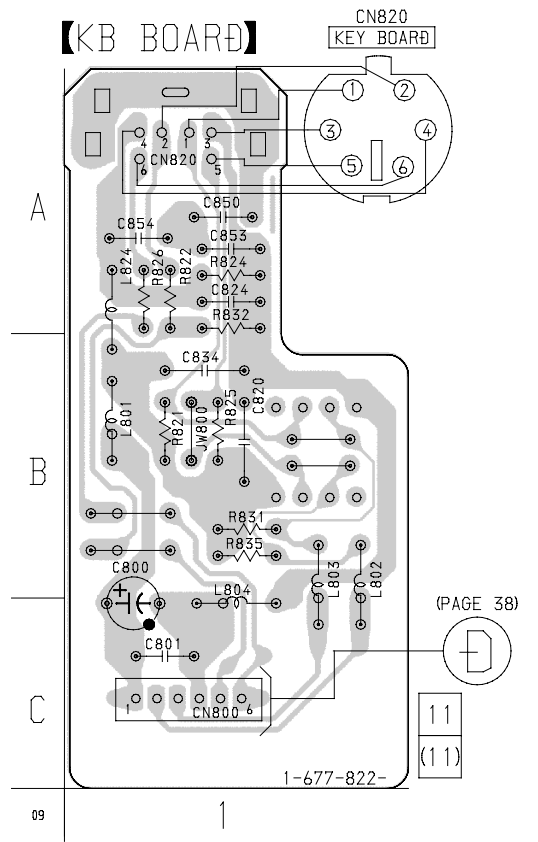
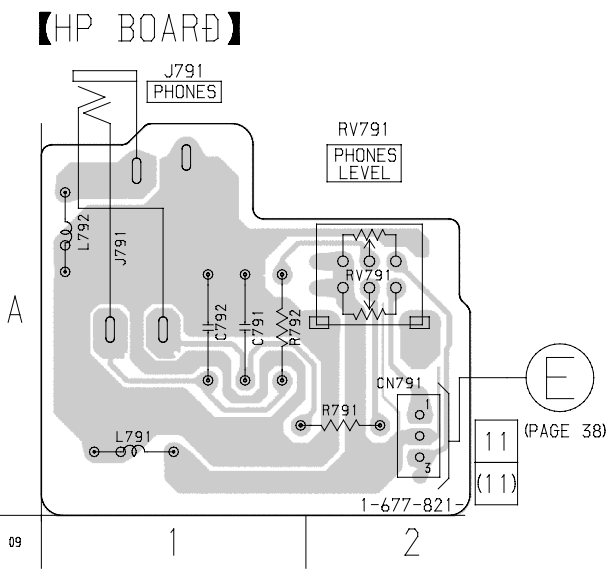
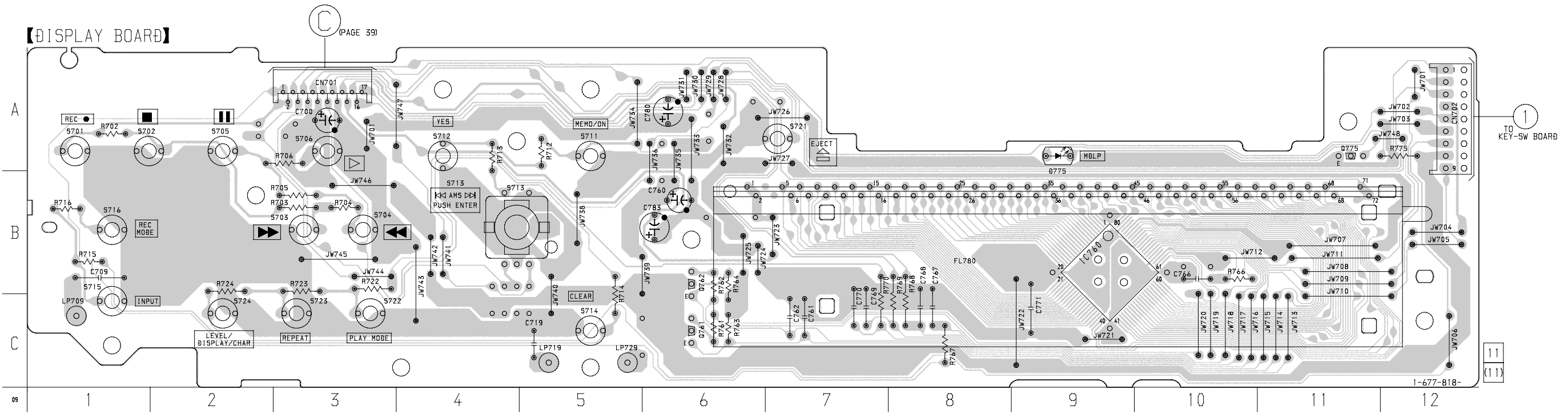


NOTE
 • Voltages and waveforms are dc with respect to ground in service mode.
 no mark:STOP

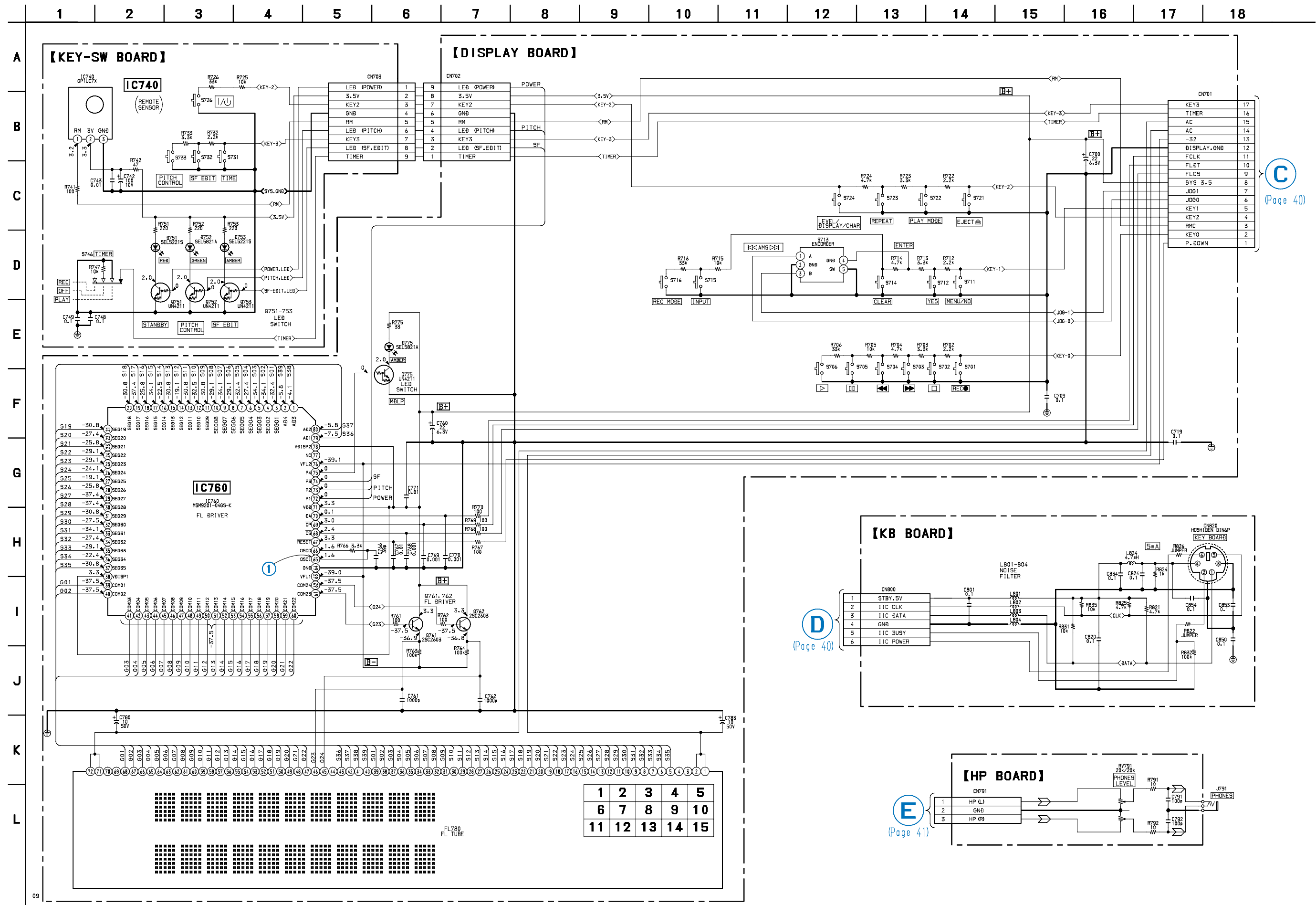
6-11. PRINTED WIRING BOARD - POWER SECTION -



6-12. PRINTED WIRING BOARD – DISPLAY SECTION –



6-13. SCHEMATIC DIAGRAM – DISPLAY SECTION – • See page 34 for Waveforms.



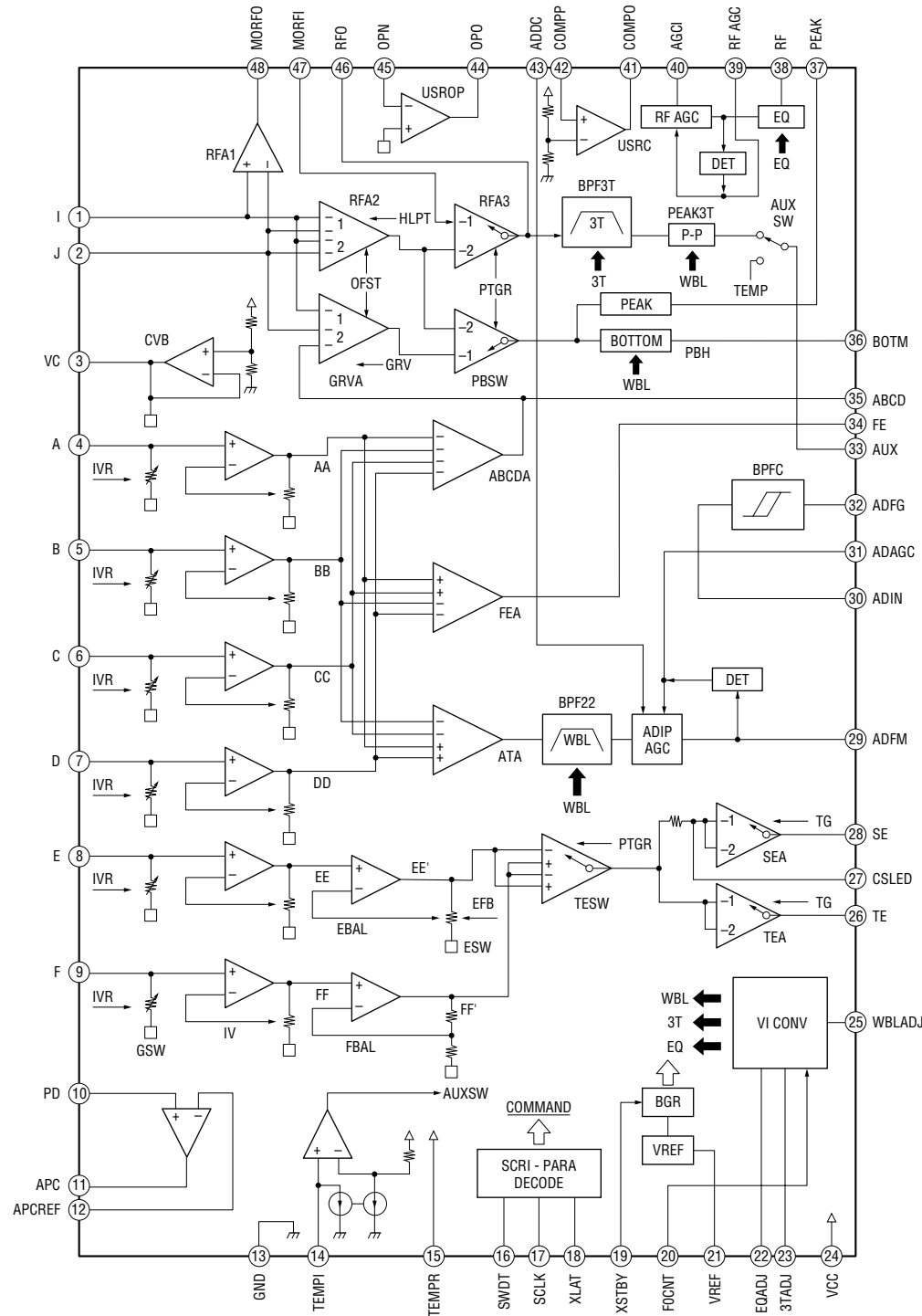
C (Page 40)

D (Page 40)

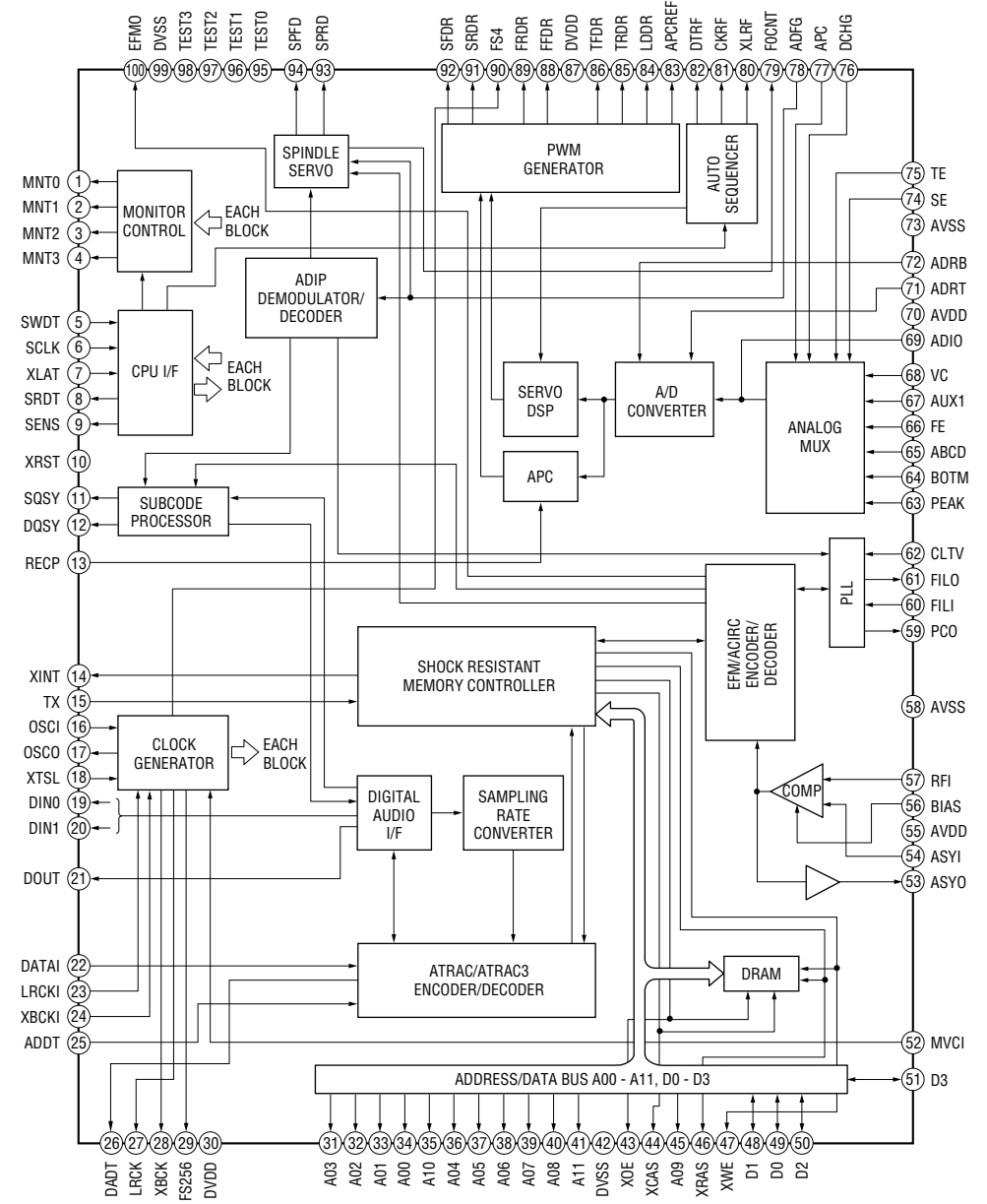
E (Page 41)

6-14. IC BLOCK DIAGRAMS

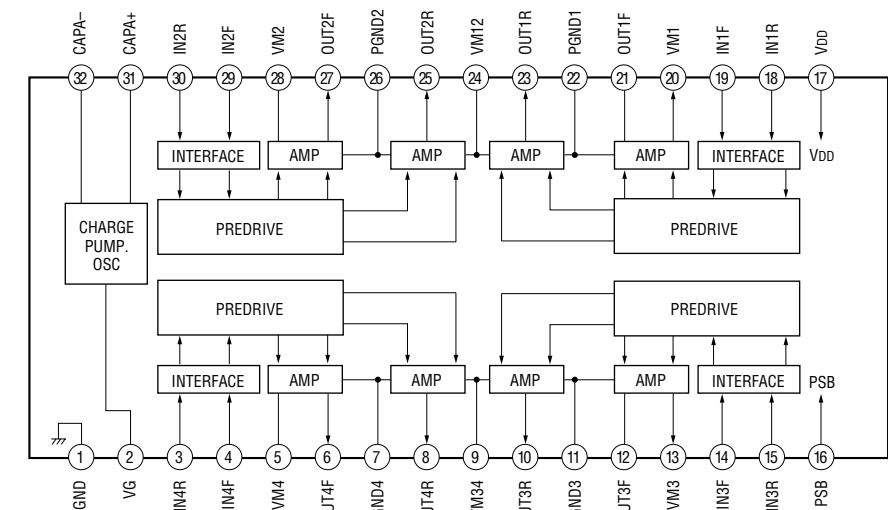
IC101 CXA2523AR (BD BOARD)



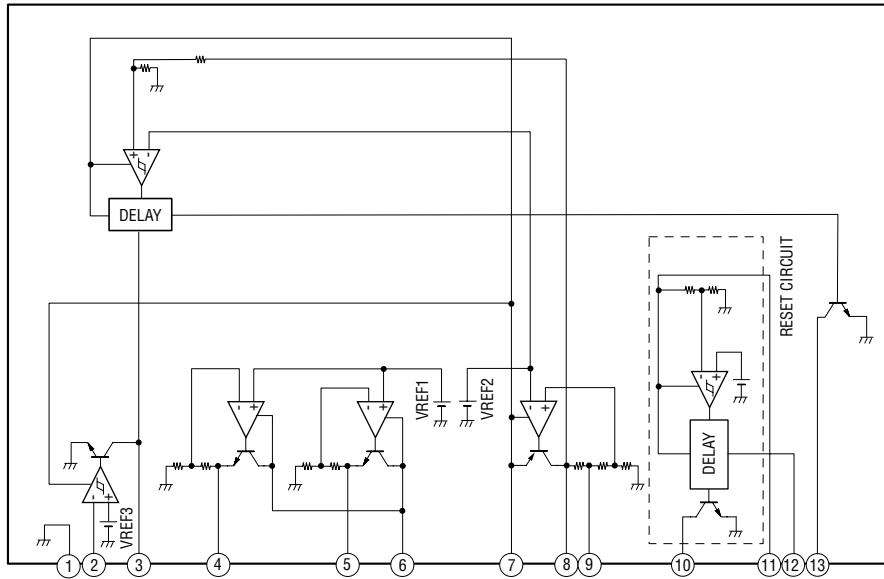
IC151 CXD2662R (BD BOARD)



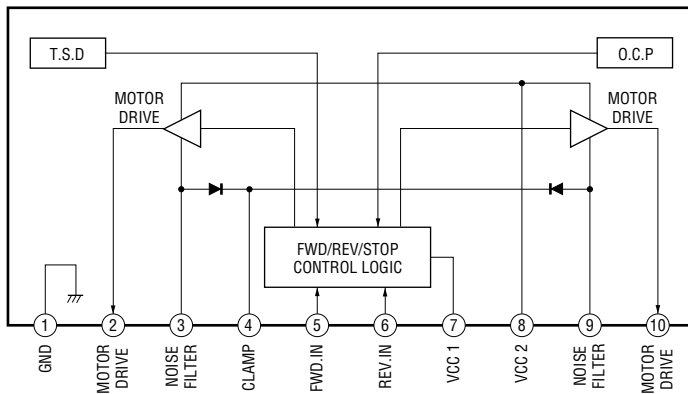
IC141 BH6511FS (BD BOARD)



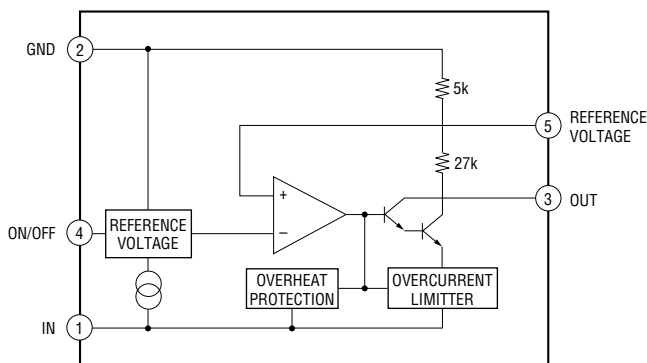
IC400 LA5643 (MAIN BOARD)



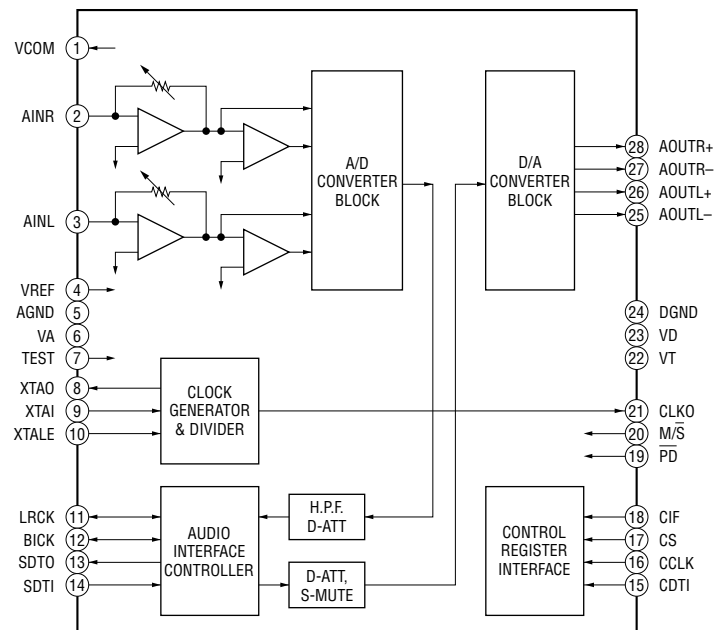
IC440 LB1641 (MAIN BOARD)



IC480 M5293L (MAIN BOARD)



IC500 AK4524-TP (MAIN 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	F0CNT	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

• IC1 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	A1-IN	I	A1 Control input. (Fixed at L)
4	SIRCS	I	Remote control input.
5 to 7	NC	—	Not used.
8	MUTE	O	Line out muting output. L: Mute
9	AD/DA RESET	O	Reset signal output to the AK4524. L: Active
10	AD/DA LATCH	O	Latch signal output to the AK4524. L: Active
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	XIN-T	O	Not used .
18	XOUT-T	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	VCC	—	Power supply. (+3.3V)
24	NMI	I	Fixed at H. (Pull-up)
25	DQSY	I	Digital in sync input. (Record system)
26	P.DOWN	I	Power down detection input. L: Power down
27	SQSY	I	ADIP (MO) sync or subcode Q (PIT) sync input from CXD2662R.(Playback system)
28	K.B-CLK	I	Keyboard clock input.
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	BEEP	O	Beep output.
34	LRCKI	I	LR clock input.
35	WR PWR	O	Write power ON/OFF output. L: OFF H: ON
36	IIC CLK	I/O	IIC serial clock input/output.
37	IIC DATA	I/O	IIC serial data input/output.
38	SWDT	O	Writing data signal output to the serial bus.
39	VCC	—	Power supply. (+3.3V)
40	SRDT	I	Reading data signal input from the serial bus.
41	VSS	—	Ground.
42	SCLK	O	Clock signal output to the serial bus.
43	REC-SW	I	Detection signal input from the recording position detection switch. L: REC
44	CLIP DATA	O	CLIP serial data output.
45	RX0(CLIP)	I	CLIP serial data input.
46	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)

Pin No.	Pin Name	I/O	Function
55	HLDA/ALE	O	Microprocessor mode output. (Not used.)
56	MNT2 (XBUSY)	I	In the state of executive command from the CXD2662R
57	VSS	—	Ground.
58	(MNT1) SHCK	I	Track jump signal input from the CXD2662R
59	VCC	—	Power supply. (+3.3V)
60	EEP-WP	O	EEP-ROM write protect signal output. L: write possibility
61	SDA	I/O	Data signal input/output pin with the EEP-ROM.
62	BUS CLK	O	Not used.
63	OE	O	Read signal output.
64	BHE CASH	O	Not used.
65	WE R/W	O	Write signal output.
66	SCL	O	Clock signal output to the EEP-ROM.
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	O	Chip select signal output to the Flash ROM.
70	CS1	O	Not used.
71	CS2	O	Not used.
72	A20	O	Not used.
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	MODEL SEL 1 to 4	O	Not used.
90	WP	O	Write protect signal to the Flash ROM.
91	VCC	—	Power supply. (+3.3V)
92	A8	O	Address bus signal output to Flash ROM.
93	VCC	—	Power supply. (+3.3V)
94 to 101	A7 to A0 LB	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	K.B-CLK-CTRL	O	Keyboard clock ON/OFF signal output. L: OFF H: ON
115	IIC BUSY	O	IIC cable connect check. L: Active
116	K.B-DATA	O	Keyboard data output.
117, 118	REC-VOL B, A	O	Not used.
119 to 122	D3 to D0	I/O	Data bus signal input/output to the Flash ROM.
123, 124	JOG1, JOG0	I	Jog dial pulse input from the rotary encoder.
125	LATCH(DA)	O	Not used.
126	REC	O	Mute signal output when Beep Rec.
127	NC	O	Not used.
128	CS(FL)	O	Chip select signal output to the display driver.
129	POWER(IIC)	O	Media commucator start-up check.
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	IOP	I	Optical Pick-up voltage (current) detect signal input.
134	(A/D-6)	I	Model discrimination.
135	(A/D-5)	I	Model discrimination.
136	TIMER/BEEP SW	I	Timer mode select signal input.
137 to 139	KEY 3 to 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.

SECTION 7 EXPLODED VIEWS

NOTE:

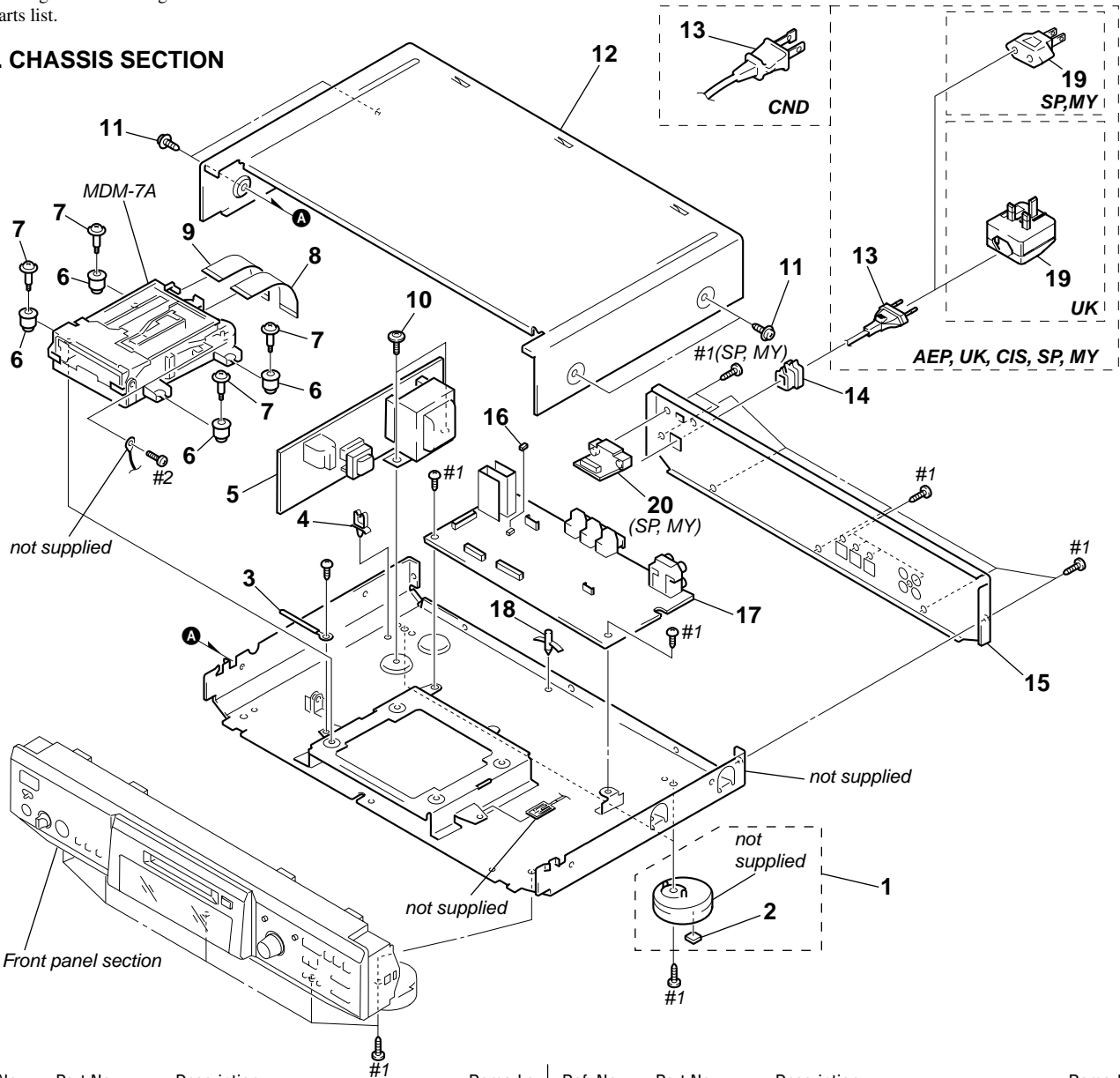
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded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

- Color Indication of Appearance Parts Example:
 KNOB, BALANCE (WHITE)
 ↑
 Parts color
- Abbreviation
 CND : Canadian model
 SP : Singapore model
 MY : Malaysia model

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

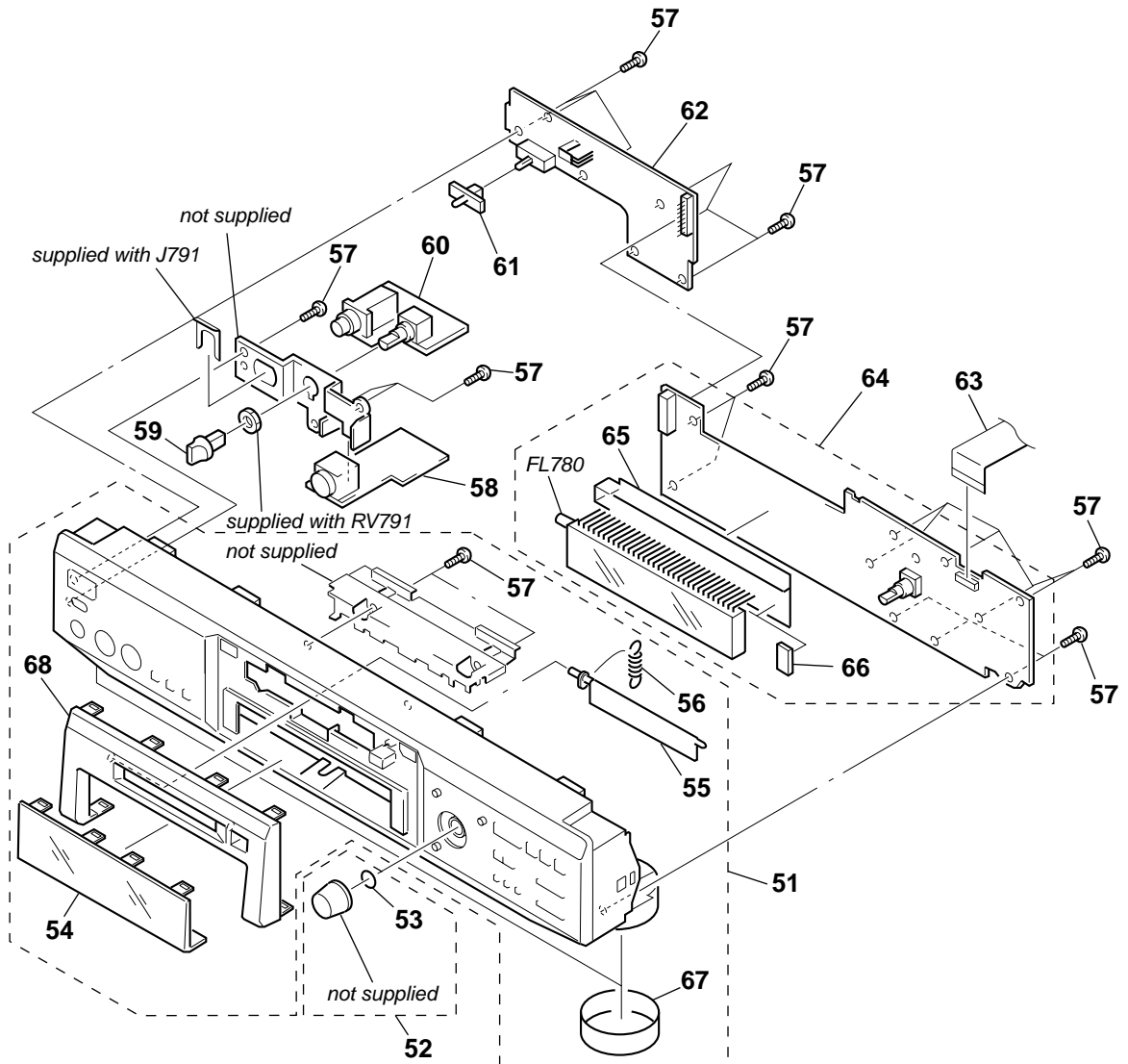
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-1. CHASSIS SECTION



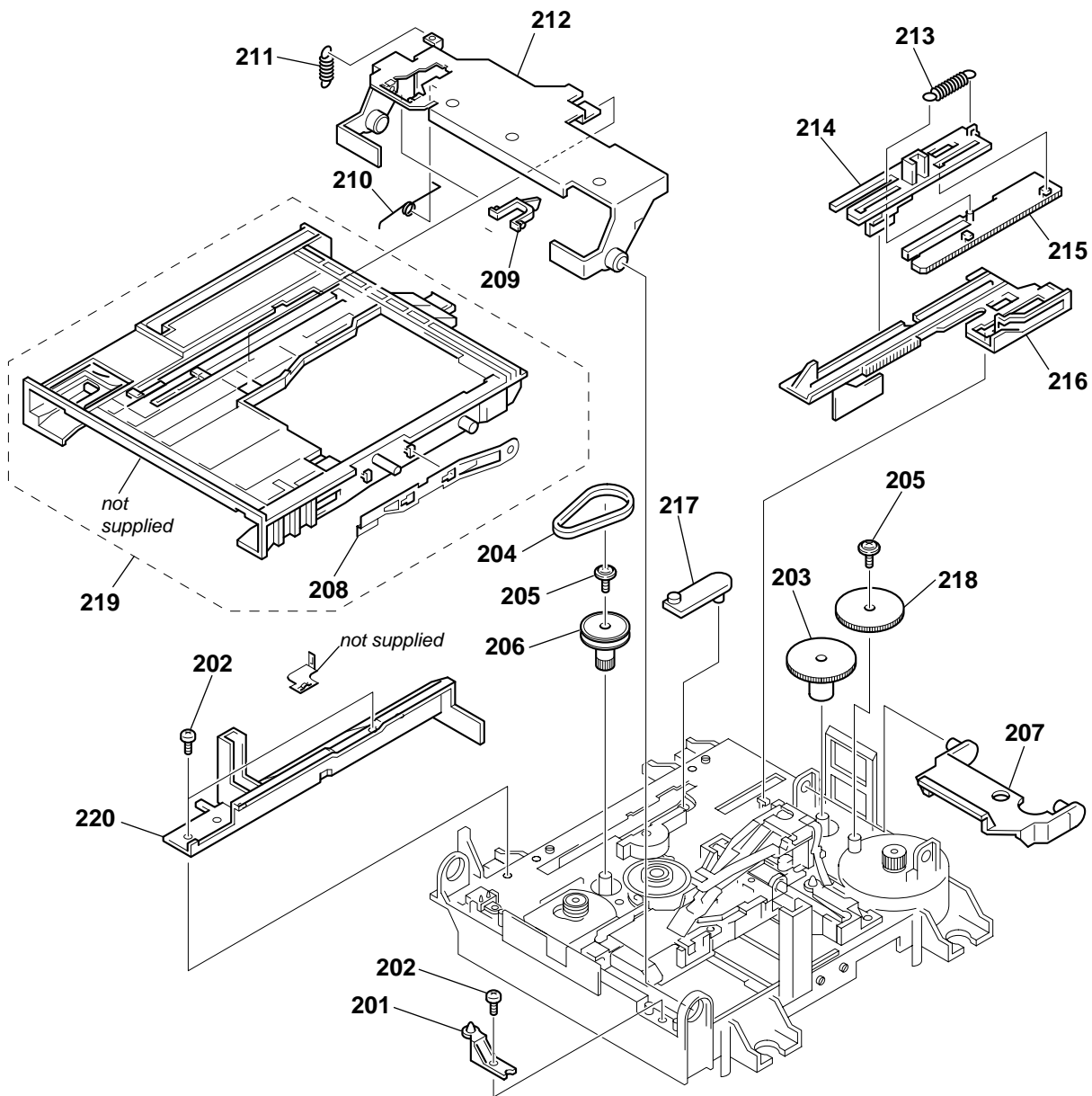
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-4947-390-3	FOOT ASSY (F50150S) (BLACK)		Δ 13	1-777-071-61	CORD, POWER (AEP,UK,CIS,SP,MY)	
1	X-4952-299-1	FOOT ASSY (F50150S) (SILVER)		Δ 13	1-783-531-31	CORD, POWER (CND)	
2	4-983-762-02	CUSHION		14	4-966-267-12	BUSHING (FBS001), CORD	
* 3	3-703-150-11	CLAMP		15	4-228-638-01	PANEL, BACK (AEP,UK,CIS)	
* 4	3-644-407-00	CLIP, AC WIRE E		15	4-228-638-31	PANEL, BACK (CND)	
5	1-677-820-11	PT BOARD		15	4-228-638-41	PANEL, BACK (SP,MY)	
6	4-228-689-01	INSULATOR		16	1-569-972-21	SOCKET, SHORT 2P	
7	4-228-643-01	SCREW (+BVTW M3), STEP		17	A-4725-416-A	MAIN BOARD, COMPLETE (CND)	
8	1-792-812-11	WIRE (FLAT TYPE) (27 CORE)		17	A-4725-422-A	MAIN BOARD, COMPLETE (AEP,UK,CIS)	
9	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)		17	A-4725-429-A	MAIN BOARD, COMPLETE (SP,MY)	
10	4-221-887-01	SCREW, +PTW M3 (S) TITE		18	3-531-576-41	RIVET (DIA. 3), NYLON	
11	4-210-291-01	SCREW (CASE 3 TP2) (BLACK)		Δ 19	1-569-008-21	ADAPTOR, CONVERSION 2P (SP,MY)	
11	4-210-291-11	SCREW (CASE 3 TP2) (SILVER)		Δ 19	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)	
12	4-983-661-01	UPPER CASE (408226) (BLACK)		20	1-677-823-11	VOL-SEL BOARD (SP,MY)	
12	4-983-661-41	UPPER CASE (408226) (SILVER)					

7-2. FRONT PANEL SECTION



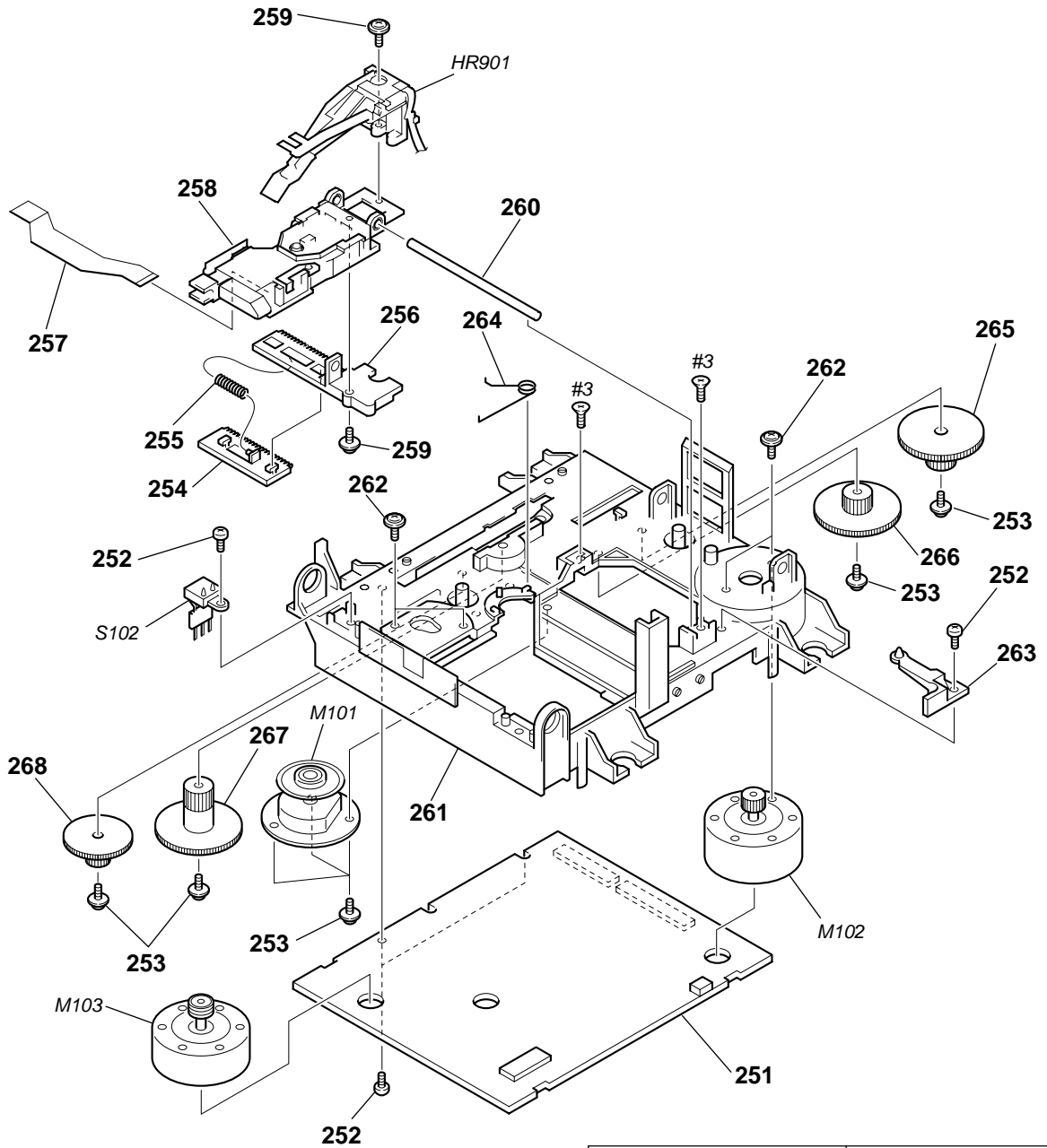
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	X-4952-917-1	PANEL ASSY, FRONT (BLACK) (AEP,UK,CIS,SP,MY)		60	1-677-821-11	HP BOARD	
51	X-4952-918-1	PANEL ASSY, FRONT (SILVER)		61	3-917-216-11	KNOB (TIMER) (BLACK)	
51	X-4952-920-1	PANEL ASSY, FRONT (BLACK) (CND)		61	3-917-216-71	KNOB (TIMER) (SILVER)	
52	A-4672-928-A	KNOB (AMS) ASSY (BLACK)		62	1-677-819-11	KEY-SW BOARD	
52	A-4672-929-A	KNOB (AMS) ASSY (SILVER)		63	1-792-814-11	WIRE (FLAT TYPE) (17 CORE)	
53	3-354-981-11	SPRING (SUS), RING		64	A-4725-412-A	DISPLAY BOARD, COMPLETE (CND)	
54	4-228-622-01	WINDOW (FL)		64	A-4725-418-A	DISPLAY BOARD, COMPLETE (AEP,UK,CIS)	
55	4-228-629-01	LID(MD) (BLACK)		64	A-4725-424-A	DISPLAY BOARD, COMPLETE (SP,MY)	
55	4-228-629-21	LID(MD) (SILVER)		* 65	4-996-686-11	HOLDER (FL)	
56	4-228-630-01	SPRING (LID), TENSION COIL		* 66	4-949-935-51	CUSHION (FL)	
57	4-951-620-01	SCREW (2.6X8), +BVTP		67	4-977-593-11	RING(DIA. 50), ORNAMENTAL (AEP,UK,CIS,SP,MY)	
58	1-677-822-11	KB BOARD		68	X-4952-923-1	ESCUTCHEON (MD) ASSY (BLACK)	
59	4-950-189-01	KNOB (A) (VOL) (BLACK)		68	X-4952-925-1	ESCUTCHEON (MD) ASSY (SILVER)	
59	4-950-189-71	KNOB (A) (VOL) (SILVER)		FL780	1-517-987-11	INDICATOR TUBE, FLUORESCENT	

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



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
* 201	4-996-267-01	BASE (BU-D)		211	4-227-012-01	SPRING (HOLDER), TENSION	
202	4-908-618-21	SCREW (+BTP) (2X6)		212	4-227-019-01	PLATE (HOLDER), RETAINER	
203	4-227-007-01	GEAR (SB)		213	4-227-013-01	SPRING (EJ), TENSION	
204	4-227-025-01	BELT (LOADING)		214	4-226-995-01	SLIDER (EJ)	
205	3-372-761-01	SCREW (M1.7), TAPPING		215	4-226-996-01	LIMITTER (EJ)	
206	4-227-002-01	GEAR, PULLEY		216	4-226-997-01	SLIDER	
207	4-226-999-01	LEVER (HEAD)		217	4-226-998-01	LEVER (CHG)	
208	X-4952-665-1	SPRING (SHT) ASSY, LEAF		218	4-227-006-01	GEAR (SA)	
209	4-228-923-01	LOCK (HOLDER)		219	A-4672-973-D	HOLDER ASSY	
210	4-229-533-01	SPRING (STOPPER), TORSION		220	4-226-994-01	GUIDE (L)	

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



<p>The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
251	A-4725-054-A	BD BOARD, COMPLETE		263	4-226-990-01	BASE (BU-A)	
252	4-908-618-21	SCREW (+BTP) (2X6)		264	4-227-023-01	SPRING (SPINDLE), TORSION	
253	3-372-761-01	SCREW (M1.7), TAPPING		265	4-227-004-01	GEAR (LC)	
254	4-226-993-01	RACK		266	4-227-005-01	GEAR (LD)	
255	4-227-014-01	SPRING (RACK), COMPRESSION		267	4-227-009-01	GEAR (SD)	
256	4-226-992-01	BASE, SL		268	4-227-008-01	GEAR (SC)	
257	1-678-514-11	FLEXIBLE BOARD		HR901	1-500-670-11	HEAD, OVER LIGHT	
Δ 258	A-4672-541-A	OPTICAL PICK-UP KMS-260B/J1N		M101	A-4672-898-A	MOTOR ASSY, SPINDLE	
259	4-988-560-01	SCREW (+P 1.7X6)		M102	A-4672-900-A	MOTOR ASSY, SLED	
260	4-996-265-01	SHAFT, MAIN		M103	A-4672-975-A	MOTOR ASSY, LOADING	
261	4-226-989-01	CHASSIS		S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT SW)	
262	4-211-036-01	SCREW (1.7X2.5), +PWH					

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...
• Abbreviation
CND : Canadian model
SP : Singapore model
MY : Malaysia model

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.

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	A-4725-054-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	1-162-968-11	CERAMIC CHIP	0.0047uF 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	1-163-038-91	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	C171	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C113	1-162-968-11	CERAMIC CHIP	0.0047uF 10% 50V	C172	1-164-156-11	CERAMIC CHIP	0.1uF 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	1-163-038-91	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	1-131-872-91	CERAMIC CHIP	1000PF 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	8-719-080-81	DIODE FS1J6	
C153	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D183	8-719-080-81	DIODE FS1J6	
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	
				IC151	8-752-404-64	IC CXD2662R	

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
IC153	8-759-671-27	IC MSM51V4400E-70TS-K		R111	1-216-833-91	RES-CHIP 10K	5% 1/16W
IC171	8-759-096-87	IC TC7WU04FU(TE12R)		R112	1-216-829-11	METAL CHIP 4.7K	5% 1/16W
IC181	8-759-481-17	IC MC74ACT08DTR2		R113	1-216-833-91	RES-CHIP 10K	5% 1/16W
IC190	8-759-460-72	IC BA033FP-E2		R114	1-216-827-11	METAL CHIP 3.3K	5% 1/16W
IC195	8-759-640-41	IC BR24C08F-E2		R115	1-216-833-91	RES-CHIP 10K	5% 1/16W
< JUMPER RESISTOR >							
JW201	1-216-295-91	SHORT	0	R116	1-216-839-11	METAL CHIP 33K	5% 1/16W
JW202	1-216-295-91	SHORT	0	R117	1-216-837-11	METAL CHIP 22K	5% 1/16W
JW203	1-216-295-91	SHORT	0	R118	1-218-855-11	METAL CHIP 2.2K	0.5% 1/16W
JW903	1-216-295-91	SHORT	0	R119	1-218-863-11	METAL CHIP 4.7K	0.5% 1/16W
JW904	1-216-295-91	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	1-216-833-91	RES-CHIP 10K	5% 1/16W
L144	1-412-032-11	INDUCTOR CHIP	100uH	R132	1-216-841-11	METAL CHIP 47K	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	1-216-295-91	SHORT	0
L171	1-500-245-11	INDUCTOR CHIP	0uH	R138	1-216-833-91	RES-CHIP 10K	5% 1/16W
L180	1-469-855-21	FERRITE	0uH	R150	1-216-833-91	RES-CHIP 10K	5% 1/16W
L181	1-469-855-21	FERRITE	0uH	R151	1-216-833-91	RES-CHIP 10K	5% 1/16W
L182	1-500-245-11	INDUCTOR CHIP	0uH	R154	1-216-833-91	RES-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	1-216-833-91	RES-CHIP 10K	5% 1/16W
Q131	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR		R160	1-216-833-91	RES-CHIP 10K	5% 1/16W
Q132	8-729-903-10	TRANSISTOR FMW1-T-148		R161	1-216-833-91	RES-CHIP 10K	5% 1/16W
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	8-729-018-75	TRANSISTOR 2SJ278MYTR		R165	1-216-809-11	METAL CHIP 100	5% 1/16W
Q182	8-729-017-65	TRANSISTOR 2SK1764KYTR		R167	1-216-833-91	RES-CHIP 10K	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	1-216-833-91	RES-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		
R181	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R182	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R183	1-216-841-11	METAL CHIP	47K	5%	1/16W		
R184	1-220-942-11	METAL CHIP	3.3	1%	1/4W		
R185	1-220-942-11	METAL CHIP	3.3	1%	1/4W		
R195	1-216-833-91	RES-CHIP	10K	5%	1/16W		
R196	1-216-833-91	RES-CHIP	10K	5%	1/16W		
R197	1-216-833-91	RES-CHIP	10K	5%	1/16W		
R218	1-216-864-11	METAL CHIP	0	5%	1/16W		

BD **DISPLAY** **HP**

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S101	1-762-596-21	SWITCH, PUSH (1 KEY) (LIMIT SW)	
S103	1-771-956-21	SWITCH, PUSH (1 KEY) (OUT SW)	
S104	1-771-955-21	SWITCH, PUSH (1 KEY) (PLAY SW)	
S105	1-771-955-21	SWITCH, PUSH (1 KEY) (REC SW)	

	A-4725-412-A	DISPLAY BOARD, COMPLETE (CND)	

	A-4725-418-A	DISPLAY BOARD, COMPLETE (AEP,UK,CIS)	

	A-4725-424-A	DISPLAY BOARD, COMPLETE (SP,MY)	

*	4-949-935-51	CUSHION (FL)	
*	4-996-686-11	HOLDER (FL)	
		< CAPACITOR >	
C700	1-126-153-11	ELECT 22uF 20% 6.3V	
C709	1-164-159-11	CERAMIC 0.1uF 50V	
C719	1-164-159-11	CERAMIC 0.1uF 50V	
C760	1-126-153-11	ELECT 22uF 20% 6.3V	
C761	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C762	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C766	1-162-213-31	CERAMIC 39PF 5% 50V	
C767	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C768	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C769	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C770	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C771	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C780	1-124-261-00	ELECT 10uF 20% 50V	
C783	1-124-261-00	ELECT 10uF 20% 50V	
		< CONNECTOR >	
CN701	1-779-554-21	CONNECTOR, FFC (LIF(NON-ZIF)) 17P	
CN702	1-778-716-11	HOUSING, CONNECTOR 9P	
		< LED >	
D775	8-719-046-39	LED SEL5821A-TP15 (MDLP)	
		< FLUORESCENT INDICATOR TUBE >	
FL780	1-517-987-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC760	8-759-680-17	IC MSM9201-04GS-K	
		< TRANSISTOR >	
Q761	8-729-620-05	TRANSISTOR 2SC2603TP-EF	
Q762	8-729-620-05	TRANSISTOR 2SC2603TP-EF	
Q775	8-729-900-80	TRANSISTOR UN4211-TA	
		< RESISTOR >	
R702	1-249-421-11	CARBON 2.2K 5% 1/4W F	
R703	1-247-843-11	CARBON 3.3K 5% 1/4W	
R704	1-249-425-11	CARBON 4.7K 5% 1/4W F	
R705	1-249-429-11	CARBON 10K 5% 1/4W	
R706	1-249-435-11	CARBON 33K 5% 1/4W	
R712	1-249-421-11	CARBON 2.2K 5% 1/4W F	

Ref. No.	Part No.	Description	Remarks
R713	1-247-843-11	CARBON 3.3K 5% 1/4W	
R714	1-249-425-11	CARBON 4.7K 5% 1/4W F	
R715	1-249-429-11	CARBON 10K 5% 1/4W	
R716	1-249-435-11	CARBON 33K 5% 1/4W	
R722	1-249-421-11	CARBON 2.2K 5% 1/4W F	
R723	1-247-843-11	CARBON 3.3K 5% 1/4W	
R724	1-249-425-11	CARBON 4.7K 5% 1/4W F	
R761	1-247-807-31	CARBON 100 5% 1/4W	
R762	1-247-807-31	CARBON 100 5% 1/4W	
R763	1-249-441-11	CARBON 100K 5% 1/4W	
R764	1-249-441-11	CARBON 100K 5% 1/4W	
R766	1-247-843-11	CARBON 3.3K 5% 1/4W	
R767	1-247-807-31	CARBON 100 5% 1/4W	
R768	1-247-807-31	CARBON 100 5% 1/4W	
R769	1-247-807-31	CARBON 100 5% 1/4W	
R770	1-247-807-31	CARBON 100 5% 1/4W	
R775	1-249-399-11	CARBON 33 5% 1/4W F	
		< SWITCH >	
S701	1-762-875-21	SWITCH, KEYBOARD (REC ●)	
S702	1-762-875-21	SWITCH, KEYBOARD (■)	
S703	1-762-875-21	SWITCH, KEYBOARD (▶▶)	
S704	1-762-875-21	SWITCH, KEYBOARD (◀◀)	
S705	1-762-875-21	SWITCH, KEYBOARD (▣)	
S706	1-762-875-21	SWITCH, KEYBOARD (▷)	
S711	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)	
S712	1-762-875-21	SWITCH, KEYBOARD (YES)	
S713	1-475-235-21	ENCODER, ROTARY (◀◀◀ AMS ▷▷▷)	
S714	1-762-875-21	SWITCH, KEYBOARD (CLEAR)	
S715	1-762-875-21	SWITCH, KEYBOARD (INPUT)	
S716	1-762-875-21	SWITCH, KEYBOARD (REC MODE)	
S721	1-762-875-21	SWITCH, KEYBOARD (EJECT ▲)	
S722	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE)	
S723	1-762-875-21	SWITCH, KEYBOARD (REPEAT)	
S724	1-762-875-21	SWITCH, KEYBOARD (LEVEL/DISPLAY/CHAR)	

	1-677-821-11	HP BOARD	

		< CAPACITOR >	
C791	1-162-282-31	CERAMIC 100PF 10% 50V	
C792	1-162-282-31	CERAMIC 100PF 10% 50V	
		< JACK >	
J791	1-770-306-11	JACK (LARGE TYPE) (PHONES)	
		< RESISTOR >	
R791	1-249-393-11	CARBON 10 5% 1/4W F	
R792	1-249-393-11	CARBON 10 5% 1/4W F	
		< VARIABLE RESISTOR >	
RV791	1-225-590-11	RES, VAR, CARBON 20K/20K (LEVEL)	

Ref. No.	Part No.	Description	Remarks
	1-677-822-11	KB BOARD *****	
		< CAPACITOR >	
C801	1-164-159-11	CERAMIC 0.1uF	50V
C820	1-164-159-11	CERAMIC 0.1uF	50V
C824	1-164-159-11	CERAMIC 0.1uF	50V
C834	1-164-159-11	CERAMIC 0.1uF	50V
C850	1-164-159-11	CERAMIC 0.1uF	50V
C853	1-164-159-11	CERAMIC 0.1uF	50V
C854	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
CN820	1-785-945-11	CONNECTOR, DIN (KEYBOARD IN)	
		< COIL >	
L801	1-424-122-11	FILTER, NOISE	
L802	1-424-122-11	FILTER, NOISE	
L803	1-424-122-11	FILTER, NOISE	
L804	1-424-122-11	FILTER, NOISE	
L824	1-410-324-11	INDUCTOR 4.7uH	
		< RESISTOR >	
R821	1-249-425-11	CARBON 4.7K 5%	1/4W F
R824	1-249-417-11	CARBON 1K 5%	1/4W F
R825	1-249-425-11	CARBON 4.7K 5%	1/4W F
R831	1-249-429-11	CARBON 10K 5%	1/4W
R832	1-249-441-11	CARBON 100K 5%	1/4W
R835	1-249-429-11	CARBON 10K 5%	1/4W

	1-677-819-11	KEY-SW BOARD *****	
		< CAPACITOR >	
C742	1-124-584-00	ELECT 100uF 20%	10V
C743	1-162-306-11	CERAMIC 0.01uF 20%	16V
C748	1-164-159-11	CERAMIC 0.1uF	50V
C749	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
CN703	1-778-715-11	CONNECTOR, BOARD TO BOARD 9P	
		< LED >	
D751	8-719-046-44	LED SEL5221S-TP15 (STANDBY)	
D752	8-719-046-39	LED SEL5821A-TP15 (PITCH CONTROL)	
D753	8-719-046-44	LED SEL5221S-TP15 (SF EDIT)	
		< IC >	
IC740	8-749-013-92	IC GP1UC7X (REMOTE SENSOR)	
		< TRANSISTOR >	
Q751	8-729-900-80	TRANSISTOR UN4211-TA	
Q752	8-729-900-80	TRANSISTOR UN4211-TA	
Q753	8-729-900-80	TRANSISTOR UN4211-TA	
		< RESISTOR >	
R725	1-249-429-11	CARBON 10K 5%	1/4W
R726	1-249-435-11	CARBON 33K 5%	1/4W

Ref. No.	Part No.	Description	Remarks
R732	1-249-421-11	CARBON 2.2K 5%	1/4W F
R733	1-247-843-11	CARBON 3.3K 5%	1/4W
R741	1-247-807-31	CARBON 100 5%	1/4W
R742	1-249-401-11	CARBON 47 5%	1/4W F
R747	1-249-429-11	CARBON 10K 5%	1/4W
R751	1-249-409-11	CARBON 220 5%	1/4W F
R752	1-249-409-11	CARBON 220 5%	1/4W F
R753	1-249-409-11	CARBON 220 5%	1/4W F
		< SWITCH >	
S726	1-762-875-21	SWITCH, KEYBOARD (I/O)	
S731	1-762-875-21	SWITCH, KEYBOARD (TIME)	
S732	1-762-875-21	SWITCH, KEYBOARD (SF EDIT)	
S733	1-762-875-21	SWITCH, KEYBOARD (PITCH CONTROL)	
S746	1-786-027-11	SWITCH, SLIDE (TIMER)	

A-4725-416-A		MAIN BOARD, COMPLETE (CND)	*****
A-4725-422-A		MAIN BOARD, COMPLETE (AEP,UK,CIS)	*****
A-4725-429-A		MAIN BOARD, COMPLETE (SP,MY)	*****
7-685-646-79		SCREW +BVTP 3X8 TYPE2 TT(B)	
		< BATTERY >	
BT420	1-756-121-11	BATTERY, LITHIUM SECONDARY	
		< CAPACITOR >	
C1	1-126-960-11	ELECT 1uF 20%	50V
C2	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C19	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C26	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C36	1-162-960-11	CERAMIC CHIP 220PF	10% 50V
C37	1-162-960-11	CERAMIC CHIP 220PF	10% 50V
C39	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C48	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C151	1-136-356-11	MYLAR 470PF	5% 50V
C152	1-128-551-11	ELECT 22uF	20% 25V
C153	1-128-551-11	ELECT 22uF	20% 25V
C161	1-137-505-11	MYLAR 220PF	5% 50V
C165	1-137-503-11	MYLAR 0.0001uF	5% 50V
C166	1-137-503-11	MYLAR 0.0001uF	5% 50V
C171	1-137-368-11	MYLAR 0.0047uF	5% 50V
C172	1-130-471-00	MYLAR 0.001uF	5% 50V
C176	1-128-551-11	ELECT 22uF	20% 25V
C177	1-136-356-11	MYLAR 470PF	5% 50V
C251	1-136-356-11	MYLAR 470PF	5% 50V
C252	1-128-551-11	ELECT 22uF	20% 25V
C253	1-128-551-11	ELECT 22uF	20% 25V
C261	1-137-505-11	MYLAR 220PF	5% 50V
C265	1-137-503-11	MYLAR 0.0001uF	5% 50V
C266	1-137-503-11	MYLAR 0.0001uF	5% 50V
C271	1-137-368-11	MYLAR 0.0047uF	5% 50V
C272	1-130-471-00	MYLAR 0.001uF	5% 50V
C276	1-128-551-11	ELECT 22uF	20% 25V
C277	1-136-356-11	MYLAR 470PF	5% 50V
C311	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C312	1-126-916-11	ELECT 1000uF	20% 6.3V

MAIN

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C351	1-126-933-11	ELECT	100uF 20% 16V	C623	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	(CND,SP,MY)
C356	1-126-933-11	ELECT	100uF 20% 16V	C631	1-164-156-11	CERAMIC CHIP 0.1uF 25V	(AEP,UK,CIS)
C357	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C661	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C358	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C662	1-126-963-11	ELECT 4.7uF 20% 50V	
C359	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C827	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C360	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C828	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C361	1-126-933-11	ELECT	100uF 20% 16V	C829	1-104-665-11	ELECT 100uF 20% 10V	
C366	1-126-933-11	ELECT	100uF 20% 16V	C851	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C391	1-126-933-11	ELECT	100uF 20% 16V	C852	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C396	1-126-933-11	ELECT	100uF 20% 16V	C853	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C400	1-126-936-11	ELECT	3300uF 20% 16V	C854	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C403	1-126-963-11	ELECT	4.7uF 20% 50V	C855	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C404	1-126-934-11	ELECT	220uF 20% 10V	C925	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C405	1-126-916-11	ELECT	1000uF 20% 6.3V	C926	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C406	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C955	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C407	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C956	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C408	1-104-665-11	ELECT	100uF 20% 10V			< CONNECTOR >	
C410	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	CN1	1-784-384-11	CONNECTOR, FFC/FPC 27P	
C411	1-164-156-11	CERAMIC CHIP	0.1uF 25V	CN390	1-506-468-11	PIN, CONNECTOR 3P	
C412	1-126-963-11	ELECT	4.7uF 20% 50V	CN400	1-793-991-11	CONNECTOR, FFC/FPC 23P	
C413	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	CN420	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P	
C431	1-104-663-11	ELECT	33uF 20% 25V	CN490	1-794-481-21	CONNECTOR, FFC 17P	
C443	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	CN820	1-506-469-11	PIN, CONNECTOR 4P	
C447	1-126-933-11	ELECT	100uF 20% 16V	* CN902	1-764-333-11	PLUG, CONNECTOR 10P	
C461	1-126-939-11	ELECT	10000uF 20% 16V			< DIODE >	
C471	1-126-935-11	ELECT	470uF 20% 16V	D155	8-719-016-74	DIODE 1SS352-TPH3	
C476	1-126-935-11	ELECT	470uF 20% 16V	D156	8-719-016-74	DIODE 1SS352-TPH3	
C481	1-165-319-11	CERAMIC CHIP	0.1uF 50V	D255	8-719-016-74	DIODE 1SS352-TPH3	
C482	1-165-319-11	CERAMIC CHIP	0.1uF 50V	D256	8-719-016-74	DIODE 1SS352-TPH3	
C483	1-128-576-11	ELECT	100uF 20% 63V	D401	8-719-081-08	DIODE EP05Q04-TE8L3	
C484	1-165-319-11	CERAMIC CHIP	0.1uF 50V	D402	8-719-081-08	DIODE EP05Q04-TE8L3	
C485	1-126-967-11	ELECT	47uF 20% 50V	D403	8-719-081-08	DIODE EP05Q04-TE8L3	
C490	1-126-965-11	ELECT	22uF 20% 50V	D404	8-719-081-08	DIODE EP05Q04-TE8L3	
C500	1-126-934-11	ELECT	220uF 20% 10V	D412	8-719-820-05	DIODE 1SS181-TE85L	
C501	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D421	8-719-016-74	DIODE 1SS352-TPH3	
C502	1-137-366-11	MYLAR	0.0022uF 5% 50V	D422	8-719-074-34	DIODE RB495D-T146	
C503	1-137-366-11	MYLAR	0.0022uF 5% 50V	D431	8-719-016-74	DIODE 1SS352-TPH3	
C504	1-104-665-11	ELECT	100uF 20% 10V	D432	8-719-016-74	DIODE 1SS352-TPH3	
C505	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D461	8-719-200-82	DIODE 11ES2-TB5	
C515	1-162-927-11	CERAMIC CHIP	100PF 5% 50V	D462	8-719-200-82	DIODE 11ES2-TB5	
C516	1-162-927-11	CERAMIC CHIP	100PF 5% 50V	D471	8-719-200-82	DIODE 11ES2-TB5	
C517	1-162-927-11	CERAMIC CHIP	100PF 5% 50V	D472	8-719-200-82	DIODE 11ES2-TB5	
C519	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	D476	8-719-200-82	DIODE 11ES2-TB5	
C520	1-126-934-11	ELECT	220uF 20% 10V	D477	8-719-200-82	DIODE 11ES2-TB5	
C522	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D481	8-719-200-82	DIODE 11ES2-TB5	
C523	1-104-665-11	ELECT	100uF 20% 10V	D482	8-719-422-23	DIODE MA8047-TX	
C524	1-164-156-11	CERAMIC CHIP	0.1uF 25V	D851	8-719-016-74	DIODE 1SS352-TPH3	
C550	1-104-665-11	ELECT	100uF 20% 10V			< IC >	
C551	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC1	8-759-677-81	IC M30805SGP	
C552	1-162-912-11	CERAMIC CHIP	7PF 0.5PF 50V	IC2	8-759-685-93	IC MT28F800B3WG-10T-640	
C553	1-162-912-11	CERAMIC CHIP	7PF 0.5PF 50V	IC2	8-759-688-24	IC MT28F800B3WG-10T	
C554	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC160	8-759-636-55	IC M5218AFP-T1	
C601	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC260	8-759-636-55	IC M5218AFP-T1	
C611	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC350	8-759-636-55	IC M5218AFP-T1	
C612	1-126-963-11	ELECT	4.7uF 20% 50V				
C613	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V				
C621	1-164-156-11	CERAMIC CHIP	0.1uF 25V				
C622	1-126-963-11	ELECT	4.7uF 20% 50V				

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
IC390	8-759-636-55	IC M5218AFP-T1		R42	1-216-864-11	METAL CHIP	0 5% 1/16W
IC400	8-759-678-77	IC LA5643		R43	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC440	8-759-822-09	IC LB1641		R44	1-216-864-11	METAL CHIP	0 5% 1/16W
IC480	8-759-633-42	IC M5293L		R45	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC500	8-759-579-68	IC AK4524-TP		R49	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC550	8-759-548-87	IC SN74LVU04ANSR		R50	1-216-864-11	METAL CHIP	0 5% 1/16W
IC600	8-759-548-87	IC SN74LVU04ANSR		R51	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC611	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN1)		R52	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC621	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN2)	(CND,SP,MY)	R54	1-216-833-91	RES-CHIP	10K 5% 1/16W
IC661	8-749-012-69	IC GP1F38T (DIGITAL OPTICAL OUT)		R67	1-216-833-91	RES-CHIP	10K 5% 1/16W
		< JACK >		R68	1-216-833-91	RES-CHIP	10K 5% 1/16W
J150	1-784-429-11	JACK, PIN 4P (ANALOG IN/OUT)		R69	1-216-833-91	RES-CHIP	10K 5% 1/16W
J631	1-784-431-11	JACK, PIN 1P (DIGITAL COAXIAL IN)	(AEP,UK,CIS)	R70	1-216-833-91	RES-CHIP	10K 5% 1/16W
J851	1-779-655-21	JACK (SMALL TYPE) (2 GANG) (CONTROL A1II)		R90	1-216-845-11	METAL CHIP	100K 5% 1/16W
		< COIL >		R114	1-216-845-11	METAL CHIP	100K 5% 1/16W
L349	1-216-296-91	SHORT	0	R115	1-216-845-11	METAL CHIP	100K 5% 1/16W
L390	1-216-296-91	SHORT	0	R116	1-216-833-91	RES-CHIP	10K 5% 1/16W
L490	1-216-296-91	SHORT	0	R123	1-216-833-91	RES-CHIP	10K 5% 1/16W
L506	1-414-265-21	INDUCTOR	4.7uH	R124	1-216-833-91	RES-CHIP	10K 5% 1/16W
L522	1-414-265-21	INDUCTOR	4.7uH	R129	1-216-833-91	RES-CHIP	10K 5% 1/16W
L523	1-216-296-91	SHORT	0	R134	1-216-845-91	METAL CHIP	100K 5% 1/16W
L524	1-216-296-91	SHORT	0				(EXCEPT CND)
L550	1-414-265-21	INDUCTOR	4.7uH	R137	1-216-833-91	RES-CHIP	10K 5% 1/16W
L551	1-216-296-91	SHORT	0	R138	1-216-833-91	RES-CHIP	10K 5% 1/16W
L611	1-414-267-11	INDUCTOR	10uH	R139	1-216-833-91	RES-CHIP	10K 5% 1/16W
L661	1-414-267-11	INDUCTOR	10uH	R141	1-216-833-91	RES-CHIP	10K 5% 1/16W
L828	1-414-267-11	INDUCTOR	10uH	R144	1-216-833-91	RES-CHIP	10K 5% 1/16W
L829	1-414-267-11	INDUCTOR	10uH	R151	1-216-839-11	METAL CHIP	33K 5% 1/16W
		< TRANSISTOR >		R152	1-216-835-11	METAL CHIP	15K 5% 1/16W
Q1	8-729-421-22	TRANSISTOR UN2211-TX		R153	1-216-849-11	METAL CHIP	220K 5% 1/16W
Q2	8-729-120-28	TRANSISTOR 2SC1623-T1L5		R155	1-216-805-11	METAL CHIP	47 5% 1/16W
Q3	8-729-421-22	TRANSISTOR UN2211-TX		R161	1-216-833-91	RES-CHIP	10K 5% 1/16W
Q4	8-729-120-28	TRANSISTOR 2SC1623-T1L5		R162	1-216-833-91	RES-CHIP	10K 5% 1/16W
Q5	8-729-421-22	TRANSISTOR UN2211-TX		R163	1-216-833-91	RES-CHIP	10K 5% 1/16W
Q180	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO		R164	1-216-833-91	RES-CHIP	10K 5% 1/16W
Q190	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO		R165	1-216-837-11	METAL CHIP	22K 5% 1/16W
Q281	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO		R166	1-216-837-11	METAL CHIP	22K 5% 1/16W
Q290	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO		R171	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
Q356	8-729-194-57	TRANSISTOR 2SC945TP-QP		R172	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
Q380	8-729-424-08	TRANSISTOR UN2111-TX		R176	1-216-819-11	METAL CHIP	680 5% 1/16W
Q440	8-729-421-22	TRANSISTOR UN2211-TX		R177	1-216-845-11	METAL CHIP	100K 5% 1/16W
Q444	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR		R178	1-216-815-11	METAL CHIP	330 5% 1/16W
Q851	8-729-120-28	TRANSISTOR 2SC1623-T1L5		R181	1-216-833-91	RES-CHIP	10K 5% 1/16W
Q910	8-729-119-78	TRANSISTOR 2SC2785TP-E		R190	1-216-833-91	RES-CHIP	10K 5% 1/16W
		< RESISTOR >		R191	1-216-805-11	METAL CHIP	47 5% 1/16W
R1	1-216-833-91	RES-CHIP	10K 5% 1/16W	R192	1-216-805-11	METAL CHIP	47 5% 1/16W
R2	1-216-864-11	METAL CHIP	0 5% 1/16W	R251	1-216-839-11	METAL CHIP	33K 5% 1/16W
R3	1-216-809-11	METAL CHIP	100 5% 1/16W	R252	1-216-835-11	METAL CHIP	15K 5% 1/16W
R4	1-216-864-11	METAL CHIP	0 5% 1/16W	R253	1-216-849-11	METAL CHIP	220K 5% 1/16W
R10	1-216-864-11	METAL CHIP	0 5% 1/16W	R255	1-216-805-11	METAL CHIP	47 5% 1/16W
R24	1-216-833-91	RES-CHIP	10K 5% 1/16W	R261	1-216-833-91	RES-CHIP	10K 5% 1/16W
R28	1-216-833-91	RES-CHIP	10K 5% 1/16W	R262	1-216-833-91	RES-CHIP	10K 5% 1/16W
R30	1-216-833-91	RES-CHIP	10K 5% 1/16W	R263	1-216-833-91	RES-CHIP	10K 5% 1/16W
R33	1-216-864-11	METAL CHIP	0 5% 1/16W	R264	1-216-833-91	RES-CHIP	10K 5% 1/16W
R38	1-216-864-11	METAL CHIP	0 5% 1/16W	R265	1-216-837-11	METAL CHIP	22K 5% 1/16W
				R266	1-216-837-11	METAL CHIP	22K 5% 1/16W
				R271	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
				R272	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
				R276	1-216-819-11	METAL CHIP	680 5% 1/16W
				R277	1-216-845-11	METAL CHIP	100K 5% 1/16W

Ref. No.	Part No.	Description	Quantity	Value	Power	Remarks
R278	1-216-815-11	METAL CHIP	330	5%	1/16W	
R280	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R290	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R291	1-216-805-11	METAL CHIP	47	5%	1/16W	
R292	1-216-805-11	METAL CHIP	47	5%	1/16W	
△ R301	1-219-786-11	FUSIBLE	22	5%	1/4W	
△ R306	1-219-786-11	FUSIBLE	22	5%	1/4W	
R356	1-216-815-11	METAL CHIP	330	5%	1/16W	
R357	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R380	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R381	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R410	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R413	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R421	1-216-813-11	METAL CHIP	220	5%	1/16W	
R431	1-216-809-11	METAL CHIP	100	5%	1/16W	
R432	1-216-817-11	METAL CHIP	470	5%	1/16W	
R433	1-216-816-11	METAL CHIP	390	5%	1/16W	
R441	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R442	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R443	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R481	1-216-864-11	METAL CHIP	0	5%	1/16W	
R483	1-216-813-11	METAL CHIP	220	5%	1/16W	
R484	1-216-813-11	METAL CHIP	220	5%	1/16W	
R485	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R486	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R508	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R511	1-216-805-11	METAL CHIP	47	5%	1/16W	
R512	1-216-805-11	METAL CHIP	47	5%	1/16W	
R513	1-216-805-11	METAL CHIP	47	5%	1/16W	
R514	1-216-805-11	METAL CHIP	47	5%	1/16W	
R515	1-216-809-11	METAL CHIP	100	5%	1/16W	
R516	1-216-809-11	METAL CHIP	100	5%	1/16W	
R517	1-216-809-11	METAL CHIP	100	5%	1/16W	
R551	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R552	1-216-817-11	METAL CHIP	470	5%	1/16W	
R553	1-216-815-11	METAL CHIP	330	5%	1/16W	
R613	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R614	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R623	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R624	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R626	1-216-864-11	METAL CHIP	0	5%	1/16W	
R631	1-218-285-11	RES-CHIP	75	5%	1/16W	
R632	1-216-821-11	METAL CHIP	1K	5%	1/16W	(AEP,UK,CIS)
R821	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R822	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R823	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R824	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R825	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R826	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R851	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R852	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R853	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R854	1-216-797-11	METAL CHIP	10	5%	1/16W	
R855	1-216-864-11	METAL CHIP	0	5%	1/16W	
R856	1-216-864-11	METAL CHIP	0	5%	1/16W	
R911	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R912	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1016	1-216-833-11	RES-CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description	Quantity	Value	Power	Remarks
R1034	1-216-833-91	RES-CHIP	10K	5%	1/16W	(CND)
R1035	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R1036	1-216-833-91	RES-CHIP	10K	5%	1/16W	
< COMPOSITION CIRCUIT BLOCK >						
RB102	1-236-908-11	NETWORK RESISTOR (CHIP)	10K			
RB106	1-236-908-11	NETWORK RESISTOR (CHIP)	10K			
RB110	1-236-908-11	NETWORK RESISTOR (CHIP)	10K			
RB119	1-236-908-11	NETWORK RESISTOR (CHIP)	10K			
< VIBRATOR >						
X22	1-781-174-21	VIBRATOR, CERAMIC				(10MHz)
X550	1-781-998-11	VIBRATOR, CRYSTAL				(45.1584MHz)

	1-677-820-11	PT BOARD				*****
< CAPACITOR >						
△ C900	1-113-920-11	CERAMIC	0.0022uF	20%	250V	
△ C901	1-113-920-11	CERAMIC	0.0022uF	20%	250V	
△ C910	1-113-920-11	CERAMIC	0.0022uF	20%	250V	
C920	1-164-159-11	CERAMIC	0.1uF		50V	
C921	1-164-159-11	CERAMIC	0.1uF		50V	
C922	1-164-159-11	CERAMIC	0.1uF		50V	
C923	1-164-159-11	CERAMIC	0.1uF		50V	
C924	1-164-159-11	CERAMIC	0.1uF		50V	
C950	1-164-159-11	CERAMIC	0.1uF		50V	
C951	1-164-159-11	CERAMIC	0.1uF		50V	
C952	1-164-159-11	CERAMIC	0.1uF		50V	
< CONNECTOR >						
* CN900	1-580-230-11	PIN, CONNECTOR (PC BOARD)	2P			
< DIODE >						
D910	8-719-911-19	DIODE	1SS133T-72			
< LINE FILTER >						
△ LF900	1-424-485-11	FILTER, LINE				
< RELAY >						
△ RY910	1-755-356-11	RELAY				
< POWER TRANSFORMER >						
△ TR900	1-435-540-11	TRANSFORMER, POWER				(CND)
△ TR900	1-435-541-11	TRANSFORMER, POWER				(AEP,UK,CIS)
△ TR900	1-435-542-11	TRANSFORMER, POWER				(SP,MY)
△ TR950	1-435-547-11	TRANSFORMER, POWER				(CND)
△ TR950	1-435-548-11	TRANSFORMER, POWER				(AEP,UK,CIS)
△ TR950	1-435-549-11	TRANSFORMER, POWER				(SP,MY)

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
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Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	1-677-823-11	VOL-SEL BOARD (SP,MY) *****				ACCESSORIES & PACKING MATERIALS *****	
		< CONNECTOR >			1-476-057-11	REMOTE COMMANDER (RM-D47M)	
* CN951	1-573-565-11	PIN, CONNECTOR 5P (SP,MY)			1-574-264-11	CORD, OPTICAL PLUG (AUDIO 60cm)	
		< SWITCH >			1-776-263-51	CORD, CONNECTION (AUDIO 100cm)	
△ S951	1-771-474-11	SWITCH, POWER (VOLTAGE SELECTOR) (SP,MY)			1-777-172-11	CORD, CONNECTION (AUDIO 100cm)(CND)	
		*****			4-229-412-11	MANUAL, INSTRUCTION (SPANISH) (AEP)	
		MISCELLANEOUS *****			4-229-412-21	MANUAL, INSTRUCTION (SWEDISH,DANISH,FINNISH) (AEP)	
8	1-792-812-11	WIRE (FLAT TYPE) (27 CORE)			4-229-412-31	MANUAL, INSTRUCTION (ITALIAN) (AEP)	
9	1-792-811-11	WIRE (FLAT TYPE) (23 CORE)			4-229-412-41	MANUAL, INSTRUCTION (PORTUGUESE) (AEP)	
△ 13	1-777-071-61	CORD, POWER (AEP,UK,CIS,SP,MY)			4-229-586-11	MANUAL, INSTRUCTION (ENGLISH) (CND,UK,CIS,SP,MY)	
△ 13	1-783-531-31	CORD, POWER (CND)			4-229-586-21	MANUAL, INSTRUCTION (FRENCH,GERMAN,DUTCH) (CND,AEP,SP,MY)	
16	1-569-972-21	SOCKET, SHORT 2P			4-229-586-31	MANUAL, INSTRUCTION (CHINESE) (SP,MY)	
△ 19	1-569-008-21	ADAPTOR, CONVERSION 2P (SP,MY)			4-229-586-41	MANUAL, INSTRUCTION (SPANISH) (SP,MY)	
△ 19	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)			4-229-586-51	MANUAL, INSTRUCTION (POLISH,RUSSIAN) (CIS)	
63	1-792-814-11	WIRE (FLAT TYPE) (17 CORE)			4-229-724-01	CARD (KEYBOARD CHART LIST)	
257	1-678-514-11	FLEXIBLE BOARD			4-981-643-11	COVER, BATTERY (FOR RM-D47M)	
△ 258	A-4672-541-A	OPTICAL PICK-UP KMS-260B/J1N				*****	
FL780	1-517-987-11	INDICATOR TUBE, FLUORESCENT				HARDWARE LIST *****	
HR901	1-500-670-11	HEAD, OVER LIGHT			#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT(B)
M101	A-4672-898-A	MOTOR ASSY, SPINDLE			#2	7-685-850-04	SCREW +BVTT 2X3 (S)
M102	A-4672-900-A	MOTOR ASSY, SLED			#3	7-685-204-19	SCREW +KTP 2X6 TYPE2 NON-SLIT
M103	A-4672-975-A	MOTOR ASSY, LOADING					
S102	1-771-957-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT SW)					

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