MDS-W1

SERVICE MANUAL

AEP Model

Self Diagnostics
Supported model

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-JE520
MD Mechanism Type	MDM-5B
Optical Pick-up Type	KMS-260A/J1N

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser (λ = 780 nm) Emission duration: continuous
Laser output	Less than 44.6 µW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Coding	Adaptive Transform Acoustic Coding (ATRAC)
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz ±0.3 dB
Signal-to-noise ratio	Over 98 dB during playback
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
LINE (ANALOG) IN	Phono jacks	47 kilohms	500 mVrms	125 mVrms
DIGITAL OPTICAL IN1	Square optical connector jack	Optical wave length: 660 nm	—	—
DIGITAL OPTICAL IN2	Square optical connector jack	Optical wave length: 660 nm	—	—
DIGITAL COAXIAL IN	Phono jack	75 ohms	0.5 Vp-p, ±20%	—

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	28 mW	32 ohms
LINE (ANALOG) OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OPTICAL OUT	Square optical connector jack	–18 dBm	Optical wave length: 660 nm

— Continued on next page —

MINIDISC DECK

MICROFILM

SONY

General

Power requirements	220 – 230 V AC, 50/60 Hz
Power consumption	22 W
Dimensions (approx.) (w/h/d) incl. projecting parts and controls	430 × 120 × 295 mm
Mass (approx.)	5.2 kg

Supplied accessories

- Audio connecting cords (2)
- Optical cable (1)
- Remote commander (remote) RM-D21M (1)
- Sony R6 (size-AA) batteries (2)

Optional accessories

Recordable MDs MDW-60 (60 min), MDW-74 (74 min)

Design and specifications are subject to change without notice.

SELF-DIAGNOSIS FUNCTION

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

Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three-digit display (a combination of a letter and figures) and the corresponding message, so you can check the deck's condition.
If such a display appears, check the following table in order to resolve the problem.
Should any problem persist, consult your nearest Sony dealer.

Self-diagnosis display

Three-digit display/Message	Cause/Remedy
C11/Protected!!	The inserted MD is record-protected. ➡ Take out the MD, and close the record-protect tab (page 10).
C13/REC Error!!	The recording was not made properly. ➡ Set the deck in a stable place, and repeat the recording procedure.
	The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➡ Replace the disc, and repeat the recording procedure.
C13/Disc Error!!	The deck could not read the TOC of the MD properly. ➡ Take out the MD, and insert it again.
C14/Disc Error!!	The deck could not read the TOC of the MD properly. ➡ Insert another disc. ➡ If possible, erase all tracks on the MD using the All Erase Function on page 33.
C71/Din Unlock ("C71" alternates with "Din Unlock" in the display.)	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material.
	While recording from a digital component connected through the digital input connector, the digital connecting cable was unplugged or the digital component turned off. ➡ Connect the cable or turn the digital component back on.

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

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

As this unit uses two mechanism Deck A and Deck B, it carries out self-diagnosis for each deck. For buttons or knobs not specified as (Deck A) or (Deck B) in the procedure, use that of the corresponding deck.

1. With the power ON, press the ◀◀ (Deck B) button while pressing the OUTPUT and CLEAR (Deck A) buttons together.
2. Rotate the AMS knob and when "(Service)" is displayed, press the YES button.
3. Rotate the AMS knob and display "ERR DP MODE".
4. Pressing the YES button sets the error history mode and displays "total rec".
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 "ERROR DP MODE" and exits the error history mode.
9. To exit the test mode, press the MD SYNC button. The unit sets into the STANDBY state, and the test mode ends.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Selecting the Test Mode

Display	Details of History
total rec	Displays the recording time. Displayed as "r□□□□□□h". The displayed time is the total time the laser is set to the high power state. This is about 1/4 of the actual recording time. The time is displayed in decimal digits from 0h to 65535h.
total play	Displays the play time. Displayed as "p□□□□□□h". The time displayed is the total actual play time. Pauses are not counted. The time is displayed in decimal digits from 0h to 65535h.
retry err	Displays the total number of retries during recording and number of retry errors during play. Displayed as "r□□ p□□". "r" indicates the retries during recording while "p" indicates the retry errors during play. The number of retries and retry errors are displayed in hexadecimal digits from 00 to FF.
total err	Displays the total number of errors. Displayed as "total □□". The number of errors is displayed in hexadecimal digits from 00 to FF.
err history	Displays the 10 latest errors. Displayed as "0□ E@@". □ indicates the history number. The smaller the number, the more recent is the error. (00 is the latest). @@ indicates the error code. Refer to the following table for the details. The error history can be switched by rotating the AMS knob.
er refresh	Mode which erases the "retry err", "total err", and "err history" histories. When returning the unit to the customer after completing repairs, perform this to erase the past error history, After pressing the AMS button and "er refresh?" is displayed, press the YES button to erase the history. "Complete!" will be displayed momentarily. Be sure to check the following when this mode has been executed. • The data has been erased. • The mechanism operates normally when recording and play are performed.
tm refresh	Mode which erases the "total rec" and "total play" histories. These histories serve as approximate indications of when to replace the optical pickup. If the optical pickup has been replaced, perform this operation and erase the history. After pressing the AMS button and "tm refresh?" is displayed, press the YES button to erase the history. "Complete!" will be displayed momentarily. Be sure to check the following when this mode has been executed. • The data has been erased. • The mechanism operates normally when recording and play are performed.

Table of Error Codes

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

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

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

ADVARSEL

Eksplosjonsfare ved feilakting skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

VARNIG

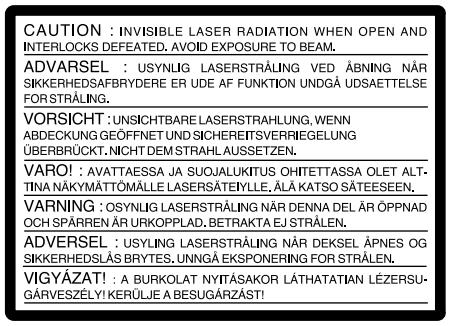
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreakrifter.

VAROITUS

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

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

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



The following caution label is located inside of the unit.

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

Notes on chip component replacement

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

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING !!

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

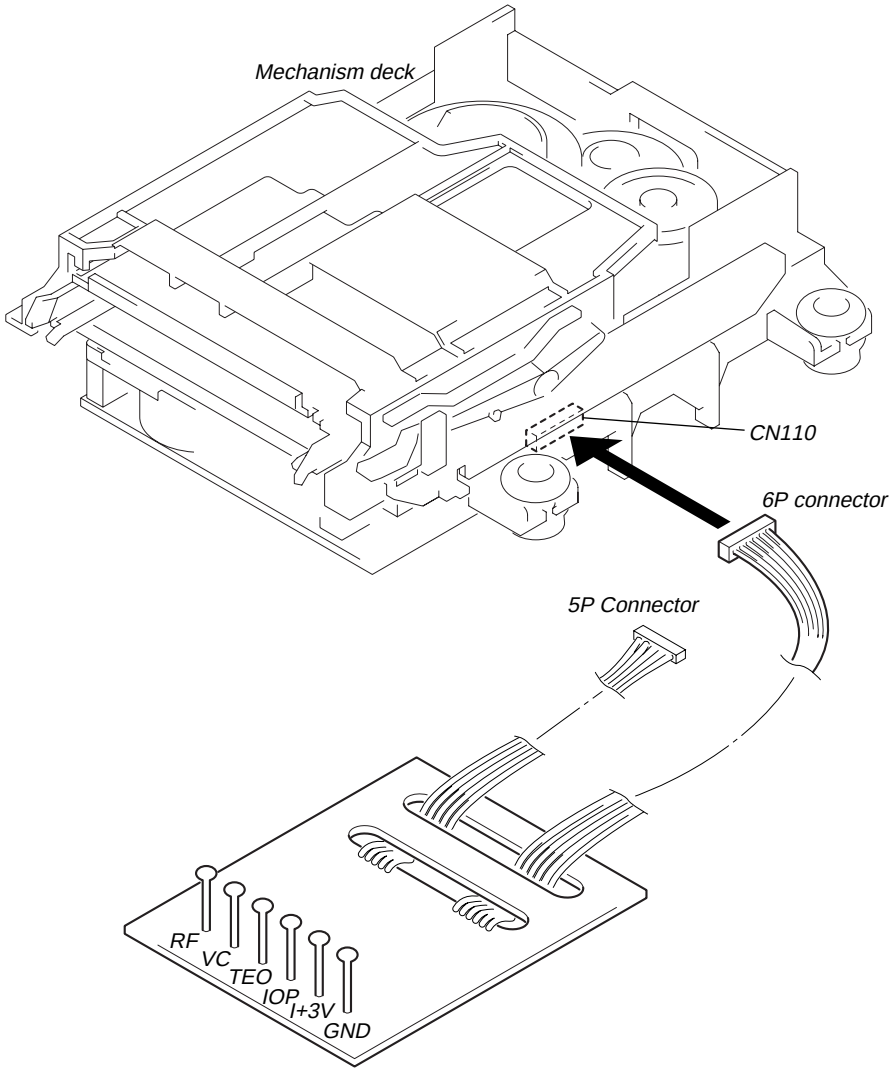
TABLE OF CONTENTS

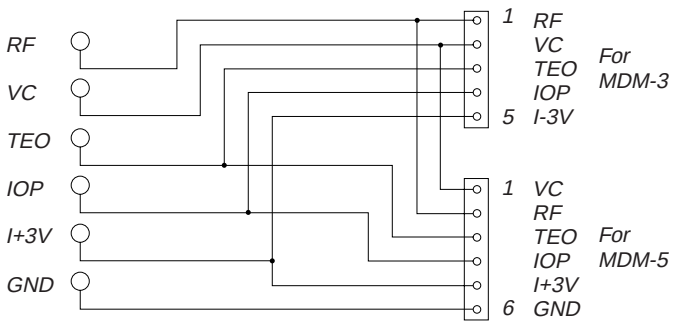
SECTION 1
SERVICING NOTE

JIG FOR CHECKING BD BOARD WAVEFORM

The special jig (J-2501-149-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)
TEO : TRK error signal (Traverse adjustment)
VC : Reference level for checking the signal
RF : RF signal (Check jitter)





IOP DATA RECORDING AND DISPLAY WHEN PICKUP AND NON-VOLATILE MEMORY (IC171 OF BD BOARD) ARE REPLACED

The IOP value labeled on the 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 pick-up or non-volatile memory (IC171 of BD board), record the IOP value on the pick-up according to the following procedure.

For buttons or knobs not specified as (Deck A) or (Deck B) in the procedure, use that of the corresponding deck.

Record Precedure:

1. With the power ON, press the [◀◀ (Deck B)] button while pressing the [OUTPUT] and [CLEAR (Deck A)] buttons together.
2. Rotate the [AMS] knob to display "(Service)", and press the [YES] button.
3. Rotate the [AMS] knob to display "lop.Write" (S: 28), 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. The value will be recorded in the non-volatile memory and the display will become "Iop Write".
9. Press the [MD SYNC] button to complete.

Display Precedure:

1. With the power ON, press the [◀◀ (Deck B)] button while pressing the [OUTPUT] and [CLEAR (Deck A)] buttons together.
2. Rotate the [AMS] knob to display "(Service)", and press the [YES] button.
3. Rotate the [AMS] knob to display "lop.Read" (S: 27).
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 [AMS] button or [MENU/NO] button to display "Iop Read". Then press the [MD SYNC] 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".

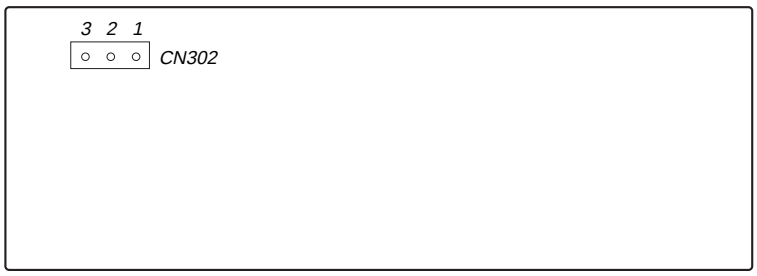
	Criteria for Determination (Unsatisfactory if specified value is not satisfied)	Measure if unsatisfactory:
Laser power check (5-6-2 : See page 44)	• 0.9 mW power Specified value : 0.84 to 0.92 mW • 7.0 mW power Specified value : 6.8 to 7.2 mW	• Clean the optical pick-up • Adjust again • Replace the optical pick-up
	lop (at 7mW) • Labeled on the optical pickup Iop value ± 10mA	• Replace the optical pick-up
Traverse check (5-6-3 : See page 44)	• Traverse waveform Specified value : Below 10% offset	• Replace the optical pick-up
Focus bias check (5-6-4 : See page 45)	• Error rate check Specified value : For points a, b, and c C1 error : Below 220 AD error : Below 2	• Replace the optical pick-up
C PLAY check (5-6-5 : See page 45)	• Error rate check Specified value: a. When using test disc (MDW-74/AU-1) C1 error : Below 80 AD error : Below 2 b. When using check disc (TDYS-1) C1 error : Below 50	• Replace the optical pick-up
Self-recording/playback check (REC/PLAY) (5-6-6 : See page 45)	• CPLAY error rate check Specified value: C1 error : Below 80 AD error : Below 2	If always unsatisfactory: • Replace the overwrite head • Check for disconnection of the circuits around the overwrite head
		If occasionally unsatisfactory: • Check if the overwrite head is distorted • Check the mechanism around the sled
TEMP check (Temperature compensation offset check) (5-6-1 : See page 44)	• Unsatisfactory if displayed as T=@@ (##) (NG" NG (@@, ## are both arbitrary numbers)	• Check for disconnection of the circuits around D101 (BD board) • Check the signals around IC101, IC121, CN102, CN103 (BD board)

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 :
Disconnect the power plug from the outlet, short-circuit Pins ① and ② of CN302 of the MAIN board and discharge the backup battery.

[MAIN BOARD] (Component Side)



Complete lighting of fluorescent display tube
The fluorescent display tube can be lit completely by the following method:
With the power ON, press the TIMER button while pressing the ■ (Deck A) and MENU/NO (Deck A) buttons.
To turn off, press the DISPLAY button.

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.

For buttons or knobs not specified as (Deck A) or (Deck B) in the procedure, use that of the corresponding deck.

Precedure:

1. Load recordable discs (the contents will be erased) in both decks.
2. With the STOP state, press the DISPLAY button while pressing the ■ (Deck A) and MENU/NO (Deck A) buttons together.
3. Press the ● REC button to start recording. Then press the ❚❚ button and start recording.
4. To check the "track mode", press the ▷ button to start play.
5. To exit the test mode, press the DISPLAY button on the STOP state.
   If the test mode cannot be exited, refer to "Forced Reset" on page 8.

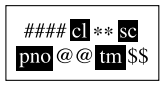
Note: Rotating the AMS knob during STOP will display as shown in Fig. 3. This is however not used in servicing.

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
- ** : Sector
  } Address (Physical address on disc)
- $$: Track mode (Track information such as copyright information of each part)

Fig. 3. (This display is not used in servicing.)

Fluorescent display tube display
- @@ : Any number

Reading the Retry Cause Display

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

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

Example

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

When A2 is displayed:
Higher bit : A = 1010 ⟶ b7+b5
Lower bit : 2 = 0010 ⟶ b2
The retry cause in this case is combined of “access fault”, “IVR rec error”, and “ader5”.

Reading the Track Mode Display

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

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

Example

When 84 is displayed:
Higher bit : 8 = 1000 ⟶ b7
Lower bit : 4 = 0100 ⟶ b2
In this case, as b2 and b7 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis OFF”, “monaural”, “original”, “copyright exists”, and “write allowed”.

Example

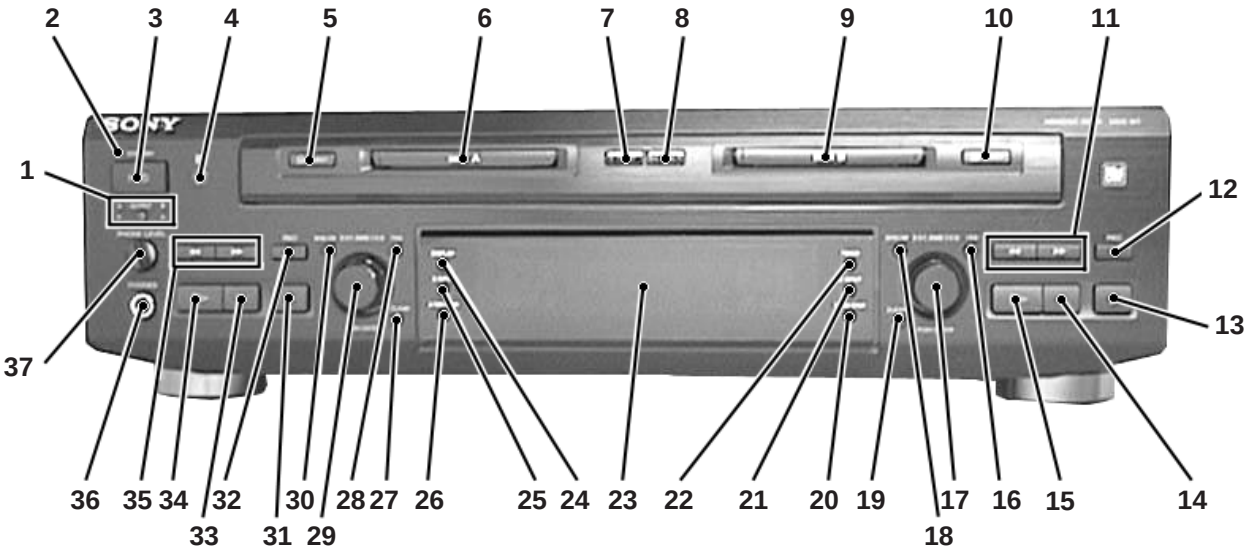
When 07 is displayed:
Higher bit : 0 = 1000 ⟶ All 0
Lower bit : 7 = 0111 ⟶ b0+b1+b2
In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis ON”, “stereo”, “original”, “copyright exists”, and “write prohibited”.

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

Front Panel



Location of Parts and Controls

1 OUTPUT button and A. B indicator
2 STANDBY indicator
3 I/⏻ (Power) button
4 Remote sensor
5 ⏏ EJECT (Deck A) button
6 DISK compartment (Deck A)
7 RELAY button and indicator
8 MD SYNC button and indicator
9 DISK compartment (Deck B)
10 ⏏ EJECT (Deck B) button
11 ◀◀, ▶▶ (Deck B) button
12 ● REC (Deck B) button
13 ■ (STOP) (Deck B) button
14 ❚❚ (PAUSE) (Deck B) button
15 ▷ (PLAY) (Deck B) button
16 YES (Deck B) button
17 ⏮◁ AMS ▷⏭ (PUSH ENTER) (Deck B) knob
18 MENU/NO (Deck B) button
19 CLEAR (Deck B) button
20 B TIME/CHAR button
21 B INPUT button
22 TIMER button
23 Display window
24 DISPLAY button
25 A INPUT button
26 A TIME/CHAR button
27 CLEAR (Deck A) button
28 YES (Deck A) button
29 ⏮◁ AMS ▷⏭ (PUSH ENTER) (Deck A) knob
30 MENU/NO (Deck A) button
31 ■ (STOP) (Deck A) button
32 ● REC (Deck A) button
33 ❚❚ (PAUSE) (Deck A) button
34 ▷ (PLAY) (Deck A) button
35 ◀◀, ▶▶ (Deck A) button
36 PHONES jack
37 PHONE LEVEL knob

* AMS is the abbreviation for Automatic Music Sensor.

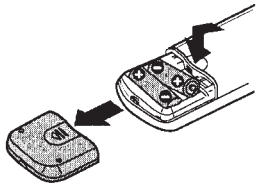
Getting Started

Unpacking

Check that you received the following items:
- Audio connecting cords (2)
- Optical cable (1)
- Remote commander (remote) RM-D21M (1)
- Sony R6 (size-AA) batteries (2)

Inserting batteries into the remote

You can control the deck using the supplied remote. Insert two R6 (size-AA) batteries by matching the + and – on the batteries. When using the remote, point it at the remote sensor ■ on the deck.



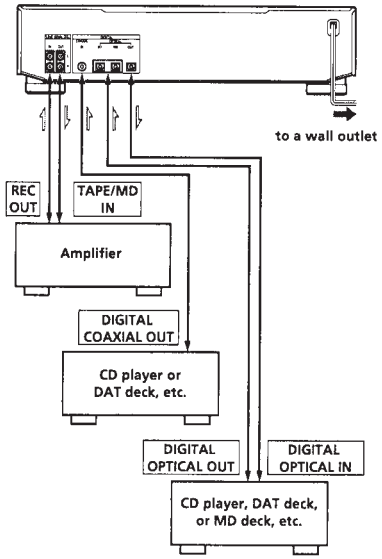
When to replace batteries
With normal use, the batteries should last for about six months. When the remote no longer operates the deck, replace all the batteries with new ones.

Notes
- Do not leave the remote near an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you don't use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

Hooking Up the System

Overview

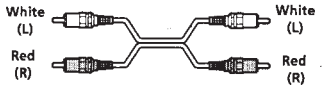
This section describes how to hook up the MD deck to an amplifier or other components such as a CD player or DAT deck. Be sure to turn off the power of each component before connection.



: Signal flow

What cords will I need?

- Audio connecting cords (supplied) (2)



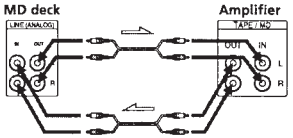
- Optical cables (only one supplied) (3)

- Coaxial digital connecting cable (not supplied) (1)

Hookups

Connecting the deck to an amplifier

Connect the amplifier to the LINE (ANALOG) IN/OUT jacks using the audio connecting cords (supplied), making sure to match the color-coded cords to the appropriate jacks on the components: red (right) to red and white (left) to white. Be sure to make connections firmly to prevent hum and noise.



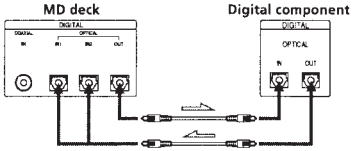
: Signal flow

Connecting the deck to a digital component such as a CD player, DAT deck, digital amplifier, or another MD deck

Connect the component through the DIGITAL OPTICAL IN1/IN2/OUT or DIGITAL COAXIAL IN connectors with two optical cables (only one supplied) and/or a coaxial digital connecting cable (not supplied).

When using the optical cables

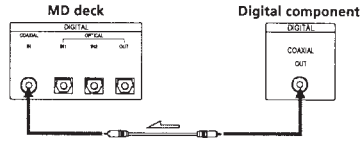
Take the caps off the connectors and then insert the plugs parallelly until they click into place.
Be sure not to bend or tie together the optical cables.



You can connect the optical cable to either OPTICAL IN1 or IN2.

: Signal flow

When using the coaxial digital connecting cable



: Signal flow

If "Din Unlock" and "C71" alternate in the display
The optical cables and/or the coaxial digital connecting cable are not connected properly. Check that the connections are secure.

Automatic conversion of digital sampling rates during recording
A built-in sampling rate converter automatically converts the sampling frequency of various digital sources to the 44.1 kHz sampling rate of your MD deck. This allows you to record sources such as 32- and 48-kHz DAT or satellite broadcasts, as well as compact discs and other MDs.

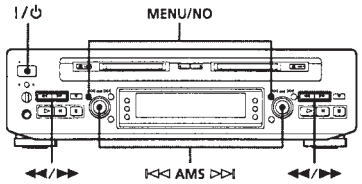
Note
If "Din Unlock" alternates with "C71", or "Cannot Copy" flashes in the display, recording through the digital connector is not possible. In this case, record the program source through the LINE (ANALOG) IN jacks with "ANLG" selected by A-INPUT or B-INPUT.

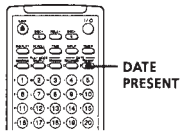
Connecting the AC power cord

Connect the AC power cord to a wall outlet or to the outlet of a timer.

Setting the Clock

Once you set the MD deck's internal clock, the MD deck will automatically record the date and time of all recordings. When playing a track, you can display the date and time the track was recorded (see page 24). In addition, you can also use the timer recording function (page 21). This operation can be performed using the buttons for either deck A or deck B.
Time on this deck is displayed on a 24-hour clock.





1 Press I/⏻.
The STANDBY indicator starts flashing.

2 While the deck is stopped, press MENU/NO twice to display SET UP menu.

3 Turn AMS to select "CLOCK", then press AMS.
The day indication in the display starts flashing.

4 Turn AMS to enter the current day, then press AMS.
The day indication stops flashing, and the month indication starts flashing.

5 Repeat Step 4 to enter the month, year, hour, and minute.
"⏻" appears in the display and the clock is set.

For precise time and date stamping of recordings
Reset the time at least once a week.

Note
If the AC power cord is disconnected for a long time, the memorized clock settings will disappear and "0:00" will flash in the display the next time you plug in and turn on the deck. If this happens, reset the clock.

Displaying the current date and time

You can display the current date and time any time even when the deck is in standby status.

Press DATE PRESENT.
When you press DATE PRESENT, the date and time appear for approximately two seconds and then the display returns to the original display.

The deck shows the clock display when the deck is in standby status.

Changing the date and/or time

1 Do Steps 1 to 3 in "Setting the Clock" on this page.

2 Press AMS (or ◀◀/▶▶) repeatedly until the item you want to change flashes.

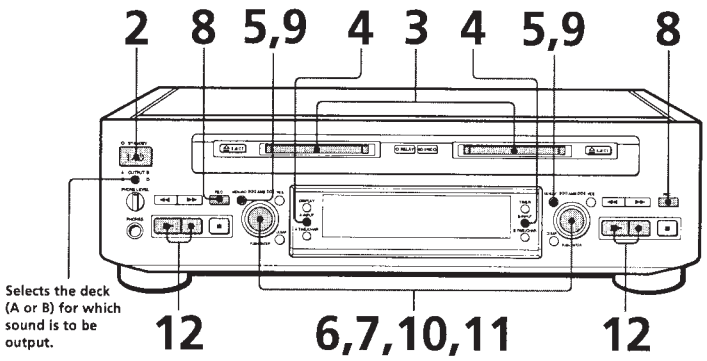
3 Turn AMS to change the contents of the selected item.

4 To complete the setting, press AMS.
The clock starts working again.

Deactivating the demonstration mode

If the MD deck does not contain a disc, demonstration mode is activated automatically after about ten minutes.
To deactivate the demonstration mode, press any button on the MD deck or the remote.
To turn off the demonstration mode, press CLEAR on both decks A and B at the same time when there is no MD in either deck. The demonstration mode will not activate next until you disconnect the AC power cord and plug it in again.

Recording on an MD



You can record on both decks.
Use the buttons for the deck containing a recordable MD.
To record on deck A and deck B at the same time, see page 8.

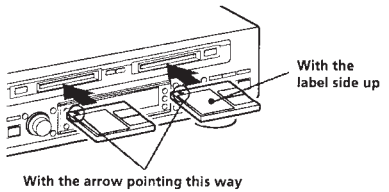
You can easily perform Synchro-Recording from deck A to deck B
See "Dubbing an MD" on page 11.

Audio output
Output switches automatically to the audio of the deck newly set to recording standby.
You can also switch the output as desired by pressing OUTPUT.

1 Turn on the amplifier and play the program source you want to record.

2 Press I/⏻.
The STANDBY indicator turns off.

3 Insert a recordable MD into deck A or deck B.



If the MD has a recorded material on it, the deck will automatically start recording from the end of the last recorded track.

(Continued)

If you insert MDs to both deck A and deck B, you can record on both decks at the same time

Setting A-INPUT and B-INPUT to the combinations marked with "O" in the table to the right lets you record on both deck A and deck B at the same time.

Notes

- While one deck is recording or in recording pause mode, if you attempt to record on the other deck using a combination marked with "—" in the table to the right, "Impossible" appears in the display. Select a combination marked with "O" to record on both decks.
- If you press A-INPUT or B-INPUT to change the input while both decks are recording or in recording pause mode, INPUT source that will result in a combination marked with "—" in the table to the right does not appear.

4 Press A-INPUT or B-INPUT repeatedly until the program source you want to record appears in the display.

Press A-INPUT when you record on deck A or press B-INPUT when you record on deck B. With the remote, press DECK A or DECK B to select the deck, then press INPUT.

Recording the sound of a component connected to the deck

To record through	Press A-INPUT or B-INPUT to select
DIGITAL OPTICAL IN1	OPT1
DIGITAL OPTICAL IN2	OPT2
DIGITAL COAXIAL IN	COAX
LINE (ANALOG) IN	ANLG

Recording from deck A to deck B, or from deck B to deck A

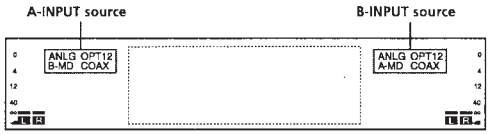
Deck A → Deck B	Press B-INPUT to select
Digital recording	A-MD
Analog recording	ANLG A-MD

Deck B → Deck A	Press A-INPUT to select
Digital recording	B-MD
Analog recording	ANLG B-MD

Make sure the input for deck A (A-INPUT) and deck B (B-INPUT) is set to a combination marked with "O" in the table below. When a combination marked with "—" is selected, you can record on only one deck.

B-INPUT / A-INPUT	ANLG	OPT1	OPT2	ANLG A-MD	A-MD	COAX
ANLG	—	O	O	—	—	O
OPT1	O	—	O	—	—	O
OPT2	O	O	—	—	—	O
ANLG B-MD	—	—	—	—	—	—
B-MD	—	—	—	—	—	—
COAX	O	O	O	—	—	—

O : Simultaneous recording possible
— : Simultaneous recording impossible



You can select SET UP menu with the remote

Press MENU SELECT ∧/∨ repeatedly until the desired menu appears, then press YES to enter it.

Monitor audio during recording

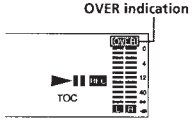
The monitor signal does not become monaural, even if you set the recording level to "MONO".

Note

When you want to make a digital recording between deck A and deck B, "Cannot Copy" may flash in the display if the MD to be recorded is the second-generation MD recorded via digital-to-digital connection (see page 47). In this case, select ANLG A-MD or ANLG B-MD with the B-INPUT or A-INPUT button.

To accurately adjust the recording level

Play the portion of the source you want to record with the strongest signal level during recording pause.
Turn AMS at this time to adjust the recording level so that the red portion of the level meter does not light (so that "OVER" does not appear). (Occasional lighting of "OVER" is acceptable.)



The volume can only be increased up to +12.0 dB. Therefore, if the output level of the connected component is too low, it may not be possible to set the recording level to maximum.

5 Press MENU/NO twice to display SET UP menu.

6 Turn AMS to select "REC MODE", then press AMS.

7 Turn AMS to select the mode you want to record in, then press AMS.

To record in	Select
Stereo sound	STEREO
Monaural sound*	MONO

* In the monaural recording, you can record about two times longer than in the stereo recording.

8 Press ● REC for the deck containing a recordable MD.
The deck becomes ready to record.
When "Impossible" appears, see the table on the preceding page to check the combination of A-INPUT and B-INPUT.

9 Press MENU/NO twice to display SET UP menu.

10 Turn AMS to select "REC LVL", then press AMS.

11 Turn AMS to adjust the recording level, then press AMS.
With the remote, press REC LEVEL +/– repeatedly.

12 Press ▷ or ❚❚.
Recording starts.

13 Start playing the program source.

(Continued)

When "TOC Writing" appears in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the I/⏻ switch.

Do not disconnect the deck from the power source immediately after recording

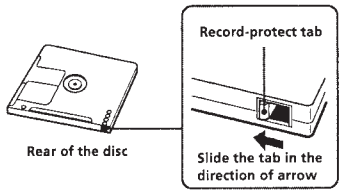
If you do, recorded material may not be saved to the MD. To save the material, after recording, press ⏏ EJECT to take out the MD or change the deck to standby by pressing I/⏻. "TOC Writing" will appear at this time. After "TOC Writing" goes out, you can pull out the AC power cord.

To	Press
Stop recording	■
Pause recording*	❚❚. Press the button again or press ▷ to resume recording.
Take out the MD	⏏ EJECT after stopping. You cannot take out the MD during recording.

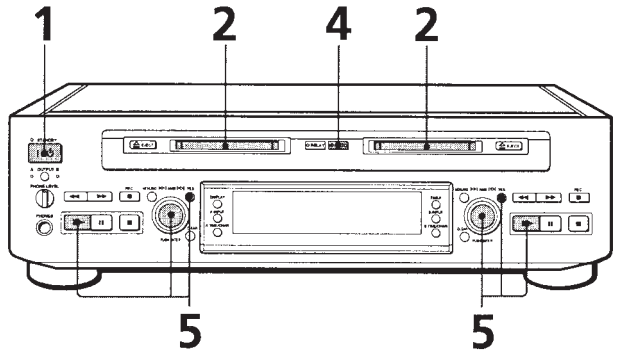
* Whenever you pause recording, the track number increases by one. For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted.

To protect an MD against accidental erasure

To make it impossible to record on an MD, slide the tab in the direction of arrow, opening the slot. To allow recording, close the slot.



Dubbing an MD (MD Synchro-Recording)



The MD Synchro-Recording Function lets you dub an MD in deck A to an MD in deck B.

When you want to dub from deck B to deck A, see "Recording on an MD" on page 7. In this case, the MD is dubbed by normal recording instead of MD Synchro-Recording.

There are three methods for dubbing an MD

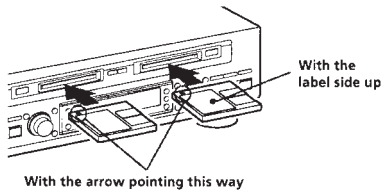
- You can copy all tracks from deck A to deck B. (All Tracks Dubbing)
- You can copy a single track from deck A to deck B. (One Track Dubbing)
- You can copy only the programed tracks from deck A to deck B. (Program Dubbing)

Notes

- When you copy all tracks, use a recordable MD that has enough time remaining to record all the tracks on deck A.
- The deck may not mark track numbers for extremely short tracks.
- You cannot dub an MD when the RELAY indicator is on. Press RELAY to turn off the indicator before starting operations.

1 Press I/⏻.
The STANDBY indicator turns off.

2 Insert a recorded MD into deck A and a recordable MD into deck B.



If the MD has a recorded material on it, the deck will automatically start recording from the end of the last recorded track.

3 Select the desired dubbing method.
Check the following table, then go to Step 4.

To perform	Make sure that
All Tracks Dubbing	the tracks are not selected while deck A is stopped.
One Track Dubbing	the track is selected while deck A is playing, pausing or stopped.
Program Dubbing	the Program Play mode in SET UP menu "PLAY MODE" is selected while deck A is stopped (page 29).

(Continued)

You can copy the disc* and track titles from the MD in deck A to the MD in deck B (Title Copy Function)

If the MD in deck A has a disc title or track titles, they are all recorded on the MD in deck B. However, if the MD in deck B already has a title, the disc title cannot be copied. In addition, the disc and track titles of premastered MDs are not copied.

* The disc title is copied only when All Tracks Dubbing.

4 Press MD SYNC.
The MD SYNC indicator turns on and deck B becomes ready to record.
For All Tracks Dubbing and Program Dubbing, "DUBBING : All" and "OK??" appear, then deck A changes to playing pause at the start of the first track to be recorded.
For One Track Dubbing, "DUBBING : 1Tr" and "OK??" appear, then deck A plays the selected track repeatedly.
"A-MD" (digital recording) or "ANLG A-MD" (analog recording) is selected automatically according to the generation of the MD in deck A (see page 47).

5 Press AMS, ▷ or YES for either deck A or deck B.
Recording starts. The sound of deck B is output.

To	Press
Cancel the procedure	MENU/NO
Stop recording	■

Do not disconnect the deck from the power source immediately after recording

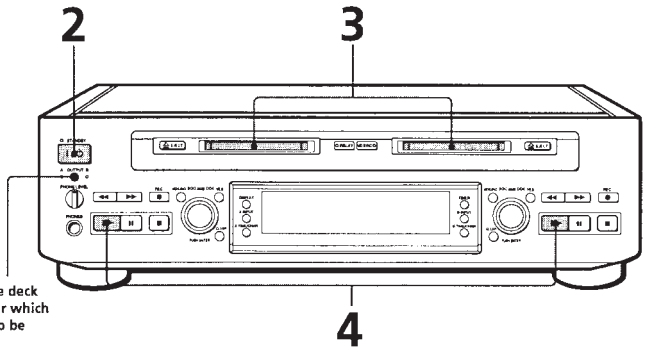
If you do, recorded material may not be saved to the MD. To save the material, after recording, press ⏏ EJECT to take out the MD or change the deck to standby by pressing I/⏻. "TOC Writing" will appear at this time. After "TOC Writing" goes out, you can pull out the AC power cord.

The recording mode (stereo recording or monaural recording) and the recording level are the same as the MD in deck A.

When "TOC Writing" appears in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the I/⏻ switch.

Playing an MD



Selects the deck (A or B) for which sound is to be output.

You can use both decks for playback.

When using the controls on the deck
Use the buttons of the deck containing the MD you want to play.

When using the remote
Press DECK A or DECK B to select the deck.

Audio output
Output switches automatically to the audio of the deck which newly starts playing.
You can also switch the output as desired by pressing OUTPUT.

You can start playing with the track selected in Step 4
1 Turn AMS (or press ⏮ or ⏭) to select the track you want to play using the display*.
2 Press AMS or ▷.

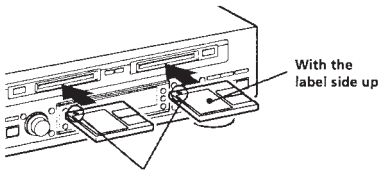
* See "Using the Display" on page 23.

To use headphones
Connect them to PHONES jack. Use PHONE LEVEL to adjust the volume.

1 Turn on the amplifier and set the source selector to the position for MD deck.

2 Press I/⏻.
The STANDBY indicator turns off.

3 Insert an MD into deck A or deck B.



4 Press ▷.
The deck starts playing. Adjust the volume on the amplifier.

To	Do the following:
Stop playing	Press ■.
Pause playing	Press ❚❚. Press the button again or press ▷ to resume playing.
Go to the next track	Turn AMS clockwise (or press ⏭ on the remote).
Go to the current track or the preceding track	Turn AMS counterclockwise (or press ⏮ on the remote).
Take out the MD	Press ⏏ EJECT after stopping playing.

Recording on MDs

Notes on Recording

If "Protected!!" and "C11" appear in the display

The MD is record-protected. Close the slot to record on the disc (see "To protect an MD against accidental erasure" on page 10).

If "Din Unlock" and "C71" alternate in the display

- The digital program source is not connected as you selected with the A-INPUT or B-INPUT button in Step 4 on page 8.
  To continue, connect the program source properly.
- The program source is not on. Turn on the program source.

Depending on the SET UP menu settings and source being recorded, track numbers are marked in following ways:

- When recording from a CD or MD connected through the digital input (DIGITAL OPTICAL IN1, IN2 or DIGITAL COAXIAL IN) connector with a digital input (OPT1, OPT2 or COAX) selected by the A-INPUT or B-INPUT button, or when making a digital recording between deck A and deck B with A-MD or B-MD selected by the B-INPUT or A-INPUT button:
  The deck automatically marks track numbers in the same sequence as the original. If, however, a track is repeated two or more times (e.g. by single-track repeat play) or two or more tracks with the same track number (e.g. from different MDs or CDs) are played, the track or tracks are recorded as part of a single, continuous track with a single track number. If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When recording from some CD players and multi disc players connected through one of the digital input connectors with a digital input selected by the A-INPUT or B-INPUT button:
  The deck may not automatically mark track numbers. In these cases, mark the track numbers after recording, using the deck's Divide Function (see "Dividing Recorded Tracks" on page 34).
- When recording from a source connected through the LINE (ANALOG) IN jacks with ANLG selected by the A-INPUT or B-INPUT button or when making an analog recording between deck A and deck B with ANLG A-MD or ANLG B-MD selected by the B-INPUT or A-INPUT button, or when recording from a DAT or satellite broadcast connected through one of the digital input connectors with a digital input selected by the A-INPUT or B-INPUT button and "LEVEL SYNC OFF" is selected in SET UP menu "LEVEL SYNC":
  The source will be recorded as a single track.
- Even while recording an analog source or a DAT or satellite broadcast, you can mark track numbers if "LEVEL SYNC ON" is selected in SET UP menu "LEVEL SYNC" (see "Marking Track Numbers While Recording" on page 17).
- When recording from DAT or satellite broadcasts with a digital input selected by the A-INPUT or B-INPUT button, the deck automatically marks a track number whenever the sampling frequency of the input signal changes regardless of SET UP menu "LEVEL SYNC" setting.

You can mark track numbers during or after recording

For details, see "Marking Track Numbers While Recording" (page 17) and "Dividing Recorded Tracks" (page 34).

When "TOC Writing" appears in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the I/⏻ switch.

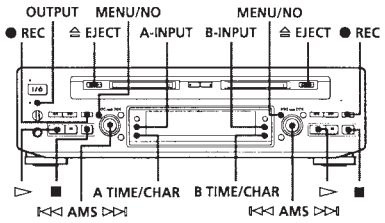
The MD deck uses the SCMS (Serial Copy Management System on page 47)

MDs recorded through digital input connector cannot be copied onto other MDs or DAT tapes through the digital output connector.

When the deck is recording or in recording pause, digital signals input through one of the digital input connectors are output to the DIGITAL OPTICAL OUT connector with the same sampling rate

To change the digital input signal to another sampling rate for output (without recording it to an MD), use Input Monitor Function (see page 15).

Useful Tips for Recording



Checking the remaining recordable time on the MD

Press A TIME/CHAR or B TIME/CHAR.

- When you press the button repeatedly while the deck is stopped, the display alternates between total disc playing time and remaining recordable time on the MD (see page 23).
- When you press the button repeatedly while recording, the display alternates between the recording time of the current track and the remaining recordable time on the MD.

Checking the remaining recordable time with the remote

Press DECK A or DECK B to select the deck, then press TIME.

Monitoring the input signal (Input Monitor)

Before starting recording, you can monitor the selected input signal through the deck's output connectors. You can monitor the input signal of deck A or deck B respectively.

1 Press ⏏ EJECT to remove the MD.

2 Press A-INPUT or B-INPUT to select the input signal you want to monitor on each deck.

When an analog input (ANLG, ANLG A-MD or ANLG B-MD) is selected

The analog signal input to deck A or deck B is output to the DIGITAL OPTICAL OUT connector after A/D conversion, and then to the LINE (ANALOG) OUT jacks and the PHONES jack after D/A conversion.

When a digital input (OPT1, OPT2, COAX, A-MD or B-MD) is selected

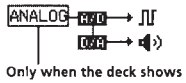
After passing through the Sampling Rate Converter (SRC), the digital signal input to deck A or deck B is output to the DIGITAL OPTICAL OUT connector, and after D/A conversion to the LINE (ANALOG) OUT jacks and PHONES jack. Set A-INPUT and B-INPUT to the combinations marked with "O" in the table below. If a combination marked with "—" is selected, you cannot monitor the input signal.

Selectable input signal combinations

B-INPUT / A-INPUT	ANLG	OPT1	OPT2	ANLG A-MD	A-MD	COAX
ANLG	—	O	O	—	O	O
OPT1	O	O	O	O	O	O
OPT2	O	O	O	O	O	O
ANLG B-MD	—	O	O	—	—	O
B-MD	O	O	O	—	—	O
COAX	O	O	O	O	O	O

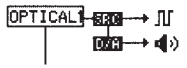
O : possible
— : impossible

3 Press ● REC for the deck to be monitored.
When the analog signal is input to the deck, the following display appears:



Only when the deck shows detail screen for deck A or B (see page 23), the selected analog input appears.

When the digital signal is input to the deck, the following display appears:



Only when the deck shows detail screen for deck A or B (see page 23), the selected digital input appears.

SRC = Sampling Rate Converter

4 Press OUTPUT to turn on the A OUTPUT or B OUTPUT indicator.
You can monitor the input signal of the deck with the lighted indicator.

(Continued)

If "Auto Cut" appears in the display (Auto Cut)

There has been no sound input for about 30 seconds during recording. The 30 seconds of silence are replaced by a blank of about 3 seconds and the deck changes to recording pause.
If the deck continues pausing for about 10 minutes after the Auto Cut Function activated, recording stops automatically.
Note that this function does not activate even if there has been no sound input for about 30 seconds when the deck started recording from the blank portion.

You can turn off the Auto Cut Function
For details, see "To turn off the Smart Space Function and Auto Cut Function" below. Note that when you turn off the Auto Cut Function, the Smart Space Function is turned off automatically.

If "Smart Space" appears in the display (Smart Space)

There has been an extended silence of 4 to 30 seconds in length during recording. The silence is replaced with a blank of about 3 seconds and the deck continues recording. Note that new track numbers may not be marked for portions recorded while this function is activated. Also, the Smart Space Function does not activate even if there has been an extended silence of 4 to 30 seconds in length when the deck started recording from the blank portion.

To turn off the Smart Space Function and Auto Cut Function

1 While the deck is stopped, press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "SMART SPACE", then press AMS.
3 Turn AMS to select "SMART SPACE OFF", then press AMS.
4 Press MENU/NO.

To turn on the Smart Space Function and Auto Cut Function again

1 Do Steps 1 and 2 in "To turn off the Smart Space Function and Auto Cut Function" above.
2 Turn AMS to select "SMART SPACE ON", then press AMS.
3 Press MENU/NO.

Notes

- When you turn off the Smart Space Function, the Auto Cut Function is also turned off automatically.
- The Smart Space Function and Auto Cut Function are factory set to on.
- If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting (SMART SPACE ON or OFF) of the Smart Space and Auto Cut Functions the next time you turn on the deck.

Playing back tracks just recorded

Do this procedure to immediately play back tracks that have just been recorded.

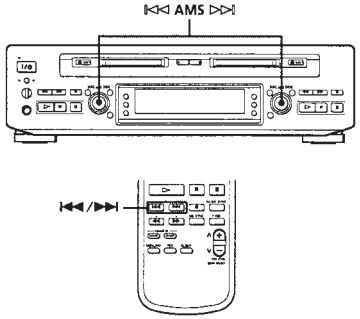
Press ▷ immediately after stopping recording.
Playback starts from the first track of the material just recorded.

To play from the first track of the MD after recording

1 Press ■ again after stopping recording.
2 Press ▷.
Playback starts from the first track of the MD.

Recording Over Existing Tracks

Follow the procedure below to record over existing material just as you would on an analog cassette tape.



1 Do Steps 1 to 7 in "Recording on an MD" on pages 7 to 9.

2 Turn AMS (or press I⋘ or ⋙I) until the number of the track to be recorded over appears.

3 To record from the start of the track, continue from Step 8 in "Recording on an MD" on page 9.

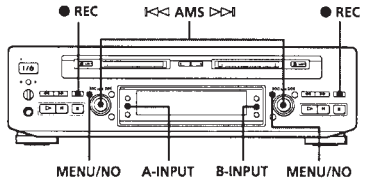
While "Over Write" flashes in the display
The deck is recording over an existing track.

To record from the middle of the track
1 After Step 2 above, press ▷ to start playback.
2 Press II where you want to start recording.
3 Continue from Step 8 in "Recording on an MD" on page 9.

Note
You cannot record from the middle of an existing track when "PGM" or "SHUF" is on.

Marking Track Numbers While Recording

You can mark track numbers either manually or automatically. By marking track numbers at specific points, you can quickly locate the points later using the AMS Function or Editing Functions.



Marking track numbers manually

You can mark track numbers at any time while recording on an MD.

Press ● REC at the place you want to add a track mark while recording.

Marking track numbers automatically (Level Synchro Function)

The deck adds track marks differently in the following cases:

- When recording from CDs or MDs with a digital input selected by the A-INPUT or B-INPUT button (when recording from a CD or MD connected through a digital input connector, or when making a digital recording between deck A and deck B):
  The deck marks track numbers automatically. However, the deck may not automatically mark track numbers when recording from some CD players and multi disc players.
- When you make an MD Synchro-Recording (see page 11), the deck marks track numbers automatically.

(Continued)

• In all other cases:
If "LEVEL SYNC ON" is selected in SET UP menu "LEVEL SYNC", the deck marks a new track number whenever the signal drops to the specified level or below for about 1.5 seconds or longer, then rises to a specified level.

Set the "LEVEL SYNC" in SET UP menu to "ON" or "OFF" as follows:

1 Press MENU/NO twice to display SET UP menu while the deck is stopped.

2 Turn AMS to select "LEVEL SYNC", then press AMS.

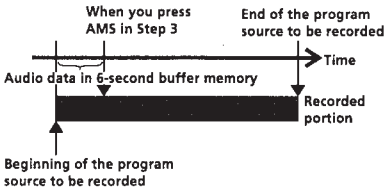
3 Turn AMS to select "LEVEL SYNC ON" or "LEVEL SYNC OFF", then press AMS.
If you select "LEVEL SYNC ON", "L.SYNC" appears in the display.

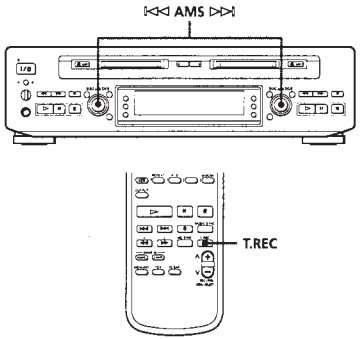
4 Press MENU/NO.

Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Level Synchro Function ("LEVEL SYNC ON" or "LEVEL SYNC OFF") the next time you turn on the deck.

Starting Recording With 6 Seconds of Prestored Audio Data (Time Machine Recording)

When recording from an FM or satellite broadcast, the first few seconds of material are often lost due to the time it takes you to ascertain the contents and press the record button. To prevent the loss of this material, the Time Machine Recording Function constantly stores 6 seconds of the most recent audio data in a buffer memory so that when you begin recording the program source using this function, the recording actually begins with the 6 seconds of audio data stored in the buffer memory in advance as shown in the illustration below.





1 Do Steps 1 to 8 in "Recording on an MD" on pages 7 to 9.
The deck changes to recording pause.

2 Start playing the program source you want to record.
The most recent 6 seconds of audio data is stored in the buffer memory.

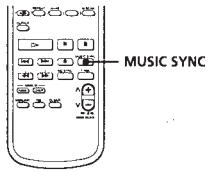
3 Press AMS (or T.REC) to start Time Machine Recording.
Recording of the program source starts with the 6 seconds of audio data stored in the buffer memory.

To stop Time Machine Recording
Press ■.

Note
The deck starts storing audio data when the deck is in recording pause and you start playing the program source. With less than 6 seconds of playing of the program source and audio data stored in the buffer memory, Time Machine Recording starts with less than 6 seconds of audio data.

Synchro-Recording With Audio Equipment of Your Choice (Music Synchro-Recording)

By using the MUSIC SYNC button on the remote, you can automatically start recording in sync with the signal input from the program source.
The method of marking track numbers differs, depending on the program source being recorded and the setting of the "LEVEL SYNC" in SET UP menu (see "Notes on Recording" on page 14).



1 Do Steps 1 to 7 in "Recording on an MD" on pages 7 to 9.

2 Press MUSIC SYNC.
The deck changes to recording pause.

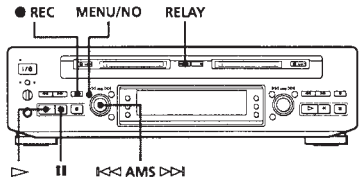
3 Start playing the program source you want to record.
The deck starts recording automatically.

To stop Music Synchro-Recording
Press ■.

Note
When Music Synchro-Recording, the Smart Space Function and the Auto Cut Function turn on automatically regardless of their setting (SMART SPACE ON or OFF) and type of input (digital or analog).

Recording on Two MDs Continuously (Relay Recording)

You can make a continuous recording that beings on an MD in deck A and ends on an MD in deck B.



1 Insert recordable MDs into both decks.

2 Do Steps 4 to 7 in "Recording on an MD" on pages 8 and 9.

3 Press RELAY.
The RELAY indicator turns on.

4 Press MENU/NO twice to display SET UP menu.

5 Turn AMS to select "OVERLAP REC", then press AMS.

6 Turn AMS to select "ON" or "OFF", then press AMS.
For details of operation when Overlap Recording is ON and OFF, see "Overlap Recording" to the right.

7 Press MENU/NO.

8 Press ● REC on deck A.
Deck A changes to recording pause.

9 Adjust the recording level (see page 9).

10 Press ▷ or II on deck A.
Recording starts.

11 Play the program source to be recorded.

To stop Relay Recording

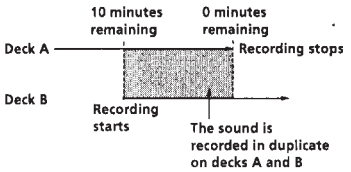
Press ■ on the deck which is recording.

Notes

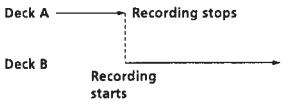
- During Relay Recording, the SET UP menu and the source you want to record are set automatically according to deck A.
- When the MD in deck A becomes full, recording on deck B (which is currently stopped) begins.
  (Relay Recording cannot be performed when deck B is playing, recording or editing.)
- When Relay Recording has finished, press RELAY to turn off the RELAY indicator.

Overlap Recording

- If you set "OVERLAP REC" to "ON" in Step 6, deck B starts recording simultaneously from the point when there is 10 minutes remaining on the MD in deck A. This is useful when you do not want a track to be divided into two portions and recorded separately on two MDs while recording a music program, etc.



- If you set "OVERLAP REC" to "OFF" in Step 6, deck B starts recording immediately after deck A stops recording. This is useful for recording linguistic materials and talk shows, etc.



Note

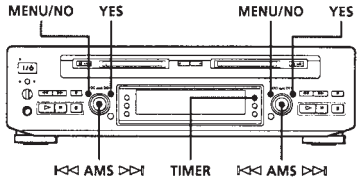
To combine portions of the same track recorded on the MDs in decks A and B into a single track, perform the following operations.

1 Move the longer portion from the MD on which it is recorded to the other MD using the 1Tr Move Function (see page 42).

2 Combine the portions into a single track using the Combine Function (see page 35).
At this time, do not dub the longer portion or move the shorter portion in Step 1, as the sound may drop out part-way through the track after the edit.

Recording on an MD Using a Timer

This function can begin recording at a specified starting time, continue recording until a specified ending time, and then turn off the deck. The Relay Recording function lets the deck continue recording on a second MD, making it possible to record even long programs.
Make sure you have set the clock (see page 6).



1 Connect the program source to a digital input connector on the deck, then select that source on the amplifier.
Refer to the instructions provided with each component, and set up the program source accordingly.

2 Insert a recordable MD into deck A and/or deck B.
To record for a long time, insert MDs into both decks.

3 Press MENU/NO twice to display SET UP menu.

4 Turn AMS to select "TIMER REC", then press AMS (or YES).

5 Turn AMS to select "ONCE" or "WEEKLY", then press AMS (or YES).
If you select "ONCE", the recording timer activates only once. If you select "WEEKLY", the timer activates at the set time on the selected day(s) of every week.

6 Set the time to start recording.
1 Turn AMS to select the day indication, then press AMS (or YES).
When you selected "WEEKLY" in Step 5, the number of the flashing day indications changes as follows:

When you activate the timer	Turn AMS until
From Sunday through Saturday	SU, MO, TU, WE, TH, FR, SA indications flash
From Monday through Friday	MO to FR indications flash
From Monday through Saturday	MO to SA indications flash
Any one day of the week	One of the SU to SA indication flashes

The hour indication starts flashing.

2 Turn AMS to set the hours, then press AMS (or YES).
The minute indication starts flashing.
3 Turn AMS to set the minutes, then press AMS (or YES).

7 Set the time to stop recording.
Set the hours and the minutes in the same manner as described in Step 6.

(Continued)

8 Prepare for recording as necessary.

1 Turn AMS to select the menu you want to make setting, then press AMS (or YES).

2 Turn AMS to make the setting, then press AMS (or YES).

Menu	You can select
DISC :	the deck in which you inserted the MD in Step 2 ("A", "A→B" or "B"). To perform Relay Recording, select "A→B".
INPUT :	the source you want to record ("ANLG", "OPT1", "OPT2" or "COAX").
REC MODE :	the recording mode ("STEREO" or "MONO").
LEVEL SYNC :	"ON" or "OFF". If you select "ON", the deck marks track numbers automatically while recording (see page 17).
SMART SPACE :	"ON" or "OFF". If you select "ON", the Auto Cut and Smart Space Functions activate (see page 16).
OVERLAP REC :	"ON" or "OFF". For details on Overlap Recording, see page 20.

9 Press TIMER.
The set contents appear in the display for about two or three seconds and then disappear. The deck turns off automatically.

To cancel timer recording
Press TIMER so that the clock indication disappears.

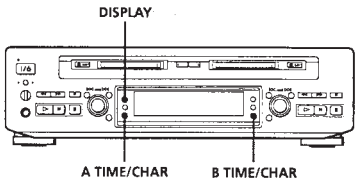
To check the set contents when the deck stands by for timer recording
Press DISPLAY.

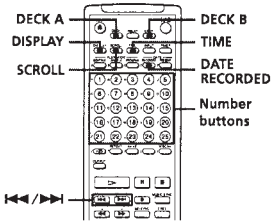
Notes

- You cannot operate any of the controls while the deck is standing by for timer recording or during timer recording. To operate the deck, cancel the timer by pressing TIMER.
- During timer recording, new material is recorded from the end of the recorded portion on the MD.
- Material recorded during timer recording is saved to the MD when the deck turns off automatically after the recording finishes. "TOC Writing" appears in the display at this time. Do not move the deck or pull out the AC power cord while "TOC Writing" is displayed to ensure the complete recording.
- Timer recording will stop if the disc becomes full.
- The deck turns on and changes to recording pause status automatically 60 seconds before the recording start time. Do not operate any of the controls during the period after the deck turns on until the actual starting time is reached. Doing so may cause the timer function to fail to operate correctly.
- Be sure to set the clock before setting the timer.
- The ONCE timer and WEEKLY timer retain their respective start and stop times settings. To use the previous timer settings, press TIMER while the deck is stopped.
  The timer check screen appears and then the deck turns off. At this time the "ONCE" or "WEEKLY" setting selected in the SET UP menu is valid.
- If you want to change the settings at the timer check screen, press MENU/NO before the deck turns off.
- Be sure to set different start and stop times.

Using the Display

You can use the display to check disc and track information such as the total track number, total playing time of the tracks, remaining recordable time of the disc, disc name, and the date when a track was recorded.



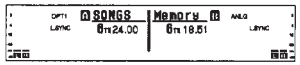


Changing the display

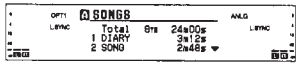
Each time you press DISPLAY while the deck is stopped or playing, you can change the display as follows:

A/B divided screen
↓
Detail screen for deck A
↓
A/B divided screen
↓
Detail screen for deck B

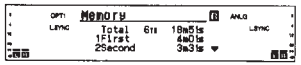
A/B divided screen



Detail screen for deck A



Detail screen for deck B

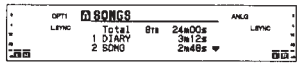


Note
If you press any controls for deck B (or deck A) while the deck shows detail screen for deck A (or deck B), the display changes to A/B divided screen.

Checking the total track number, total disc playing time and remaining recordable time of the disc

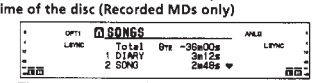
Each time you press A TIME/CHAR or B TIME/CHAR (or TIME after selecting the deck by pressing DECK A or DECK B) while the deck is stopped, you can change the display as follows: (The display below shows detail screen for deck A.)

Total track number and total playing time of all recorded tracks



Press

Total track number and remaining recordable time of the disc (Recorded MDs only)



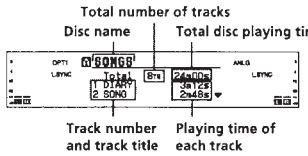
The remaining recordable time of the disc is not shown for premastered MDs.

Press

You can check all the track titles on the MD
If you turn AMS while "▼" appears in the display, the display shows the rest of the track titles and playing time of each track on the MD.
Press AMS to start playing the desired track while it is selected.

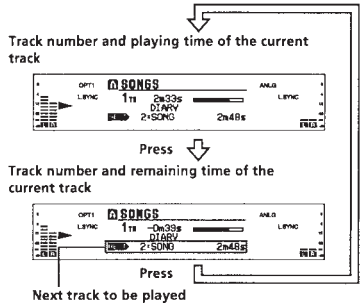
(Continued)

When you insert an MD, the disc name, total number of tracks and total disc playing time appear in the display as follows:
(The display below shows detail screen for deck A.)



Checking the playing time, remaining time, and track number

Each time you press A TIME/CHAR or B TIME/CHAR (or TIME after selecting the deck by pressing DECK A or DECK B) while playing an MD, you can change the display as follows:
(The display below shows detail screen for deck A.)



The bar in the display "▬▭" indicates how much of the current track has been played back.

The deck displays the disc and/or track title* any time
If no title is recorded, "No Name" appears instead of a title.
To label a recordable disc and its tracks, see "Labeling Recordings" on page 37.

* Only when the dislpay shows detail screen for deck A or B.

You can scroll a title of 8 or more characters (in A/B divided screen) or 17 or more characters (in detail screen for deck A and B)
Press SCROLL.
Since the display shows up to 7 characters (in A/B divided screen) or 16 characters (in detail screen for deck A and B) at a time, press SCROLL to see the rest of the title if the title has 8 (or 17) characters or more.
Press SCROLL again to pause scrolling, and again to continue scrolling.

Displaying the recording date

When the internal clock has been set, the deck automatically records the recording date and time of all recordings. You can then check the recording date and time of a track.

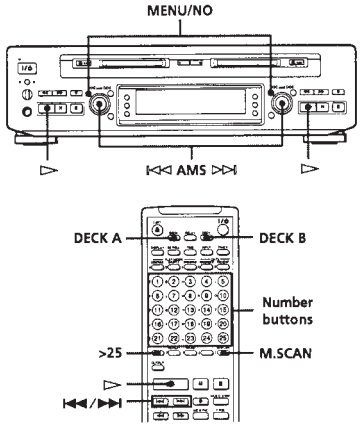
1 Locate the track for which you want to check the recording date and time.

When the deck is	Press
stopped	I◀◀ or ▶▶I
playing or on play pause	I◀◀, ▶▶I, or number buttons

2 Press DATE RECORDED.
"No Date!!" appears if the internal clock has not been set or the track was recorded on another MD deck without a date and time stamp function.

Locating a Specific Track

You can quickly locate any track while playing a disc by using the AMS (Automatic Music Sensor) control, I◀◀ and ▶▶I buttons, number buttons, or M.SCAN button on the remote.
When using the remote, press DECK A or DECK B to select the deck to be operated.



To locate	Do the following:
The next or succeeding tracks	During playback, turn AMS clockwise (or press ▶▶I repeatedly) until you find the track.
The current or preceding tracks	During playback, turn AMS counterclockwise (or press I◀◀ repeatedly) until you find the track.
A specific track directly	Press number buttons to enter the track number.
A specific track by using AMS	**1** Turn AMS until the track number you want to locate appears while the deck is stopped. (The track number is flashing.) **2** Press AMS or ▷.
By scanning each track for 6 seconds (music scan)	**1** Press M.SCAN before you start playing. **2** When you find the track you want, press ▷ to start playing.

When you directly locate a track with a number over 25
You must press >25 first, before entering the corresponding digits.
Press >25 once if it is a 2-digit track number, and twice if it is a 3-digit track number.
To enter "0", press button 10.
Examples:
- To play track number 30
  Press >25 once, then 3 and 10.
- To play track number 100
  Press >25 twice, then 1, 10 and 10.

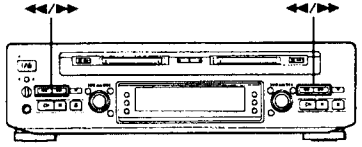
You can extend the playing time during music scan
1 While the deck is stopped, press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "MUSIC SCAN", then press AMS.
3 Turn AMS to select the desired playing time (6, 10 or 20 seconds), then press AMS.
4 Press MENU/NO.

To pause playing at the beginning of a track
Turn AMS (or press I◀◀ or ▶▶I) after pausing playback.

To go quickly to the beginning of the last track
Turn AMS counterclockwise (or press I◀◀) while the display shows the total track number, total disc playing time or remaining recordable time of the disc (recordable disc only), or disc name (see page 23).

Locating a Particular Point in a Track

You can also use the ◀◀ and ▶▶ buttons to locate a particular point in a track during playback or playback pause.
When using the remote, press DECK A or DECK B to select the deck to be operated.



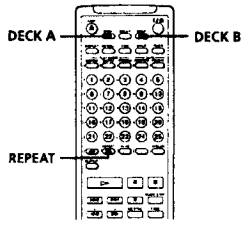
To locate a point	Press
While monitoring the sound	▶▶ (forward) or ◀◀ (backward) and keep pressing until you find the point.
Quickly by observing the display during playback pause	▶▶ or ◀◀ and keep pressing until you find the point. There is no sound output during this operation.

If "Over" appears while you are pressing ▶▶ during playback pause
The disc has reached to its end. Press ◀◀ (or I◀◀) or turn AMS counterclockwise to go back.

Notes
- If the disc reaches the end while you are pressing ▶▶ during sound monitoring, the deck stops.
- Tracks that are only a few seconds long may be too short to scan using the search function. For such tracks, it is better to play the MD at normal speed.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



1 Press DECK A or DECK B to select the deck to be operated.

2 Press REPEAT repeatedly until "REP" appears in the display.
The deck repeats the tracks as follows:

When the MD is played in	The deck repeats
Normal play (page 13)	All the tracks
Shuffle Play (page 28)	All the tracks in random order
Program Play (page 29)	The same program

To cancel repeat play
Press REPEAT several times until "REP" disappears.

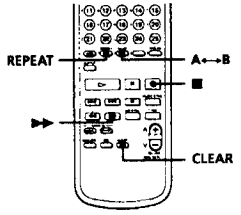
You can also use the controls on the deck to play tracks repeatedly
1 Press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "REPEAT", then press AMS.
3 Turn AMS to select "REPEAT ALL", then press AMS.
To cancel repeat play, select "OFF" in Step 3 above.

Repeating the current track
While the track you want to repeat is playing in normal, Shuffle or Program Play, press REPEAT several times until "REP 1" appears in the display. If you select "REP 1" while the deck is stopped, the deck repeats the next track to be played.

You can also use the controls on the deck to repeat the current track
1 While the track you want to repeat is playing, press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "REPEAT", then press AMS.
3 Turn AMS to select "REPEAT 1", then press AMS.
To cancel repeat play, select "OFF" in Step 3 above.

Repeating a specific portion (a-b Repeat)

You can play a specific portion of a track repeatedly. This might be useful when you want to memorize lyrics. Note that you can only repeat a portion within the boundaries of a single track.



1 While playing a disc, press A↔B at the starting point (point a) of the portion to be played repeatedly.
"a→" appears and "b" flashes in the display.

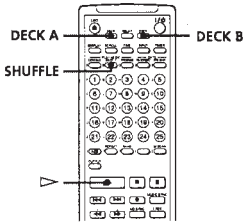
2 Continue playing the track or press ▶▶ until you reach the ending point (point b), then press A↔B again.
"a↔b" lights continuously. The deck starts to play the specified portion repeatedly.

To cancel a-b Repeat
Press REPEAT, CLEAR or ■.

Setting new starting and ending points
You can repeat the portion immediately after the currently specified portion by changing the starting and ending points.
1 Press A↔B while "a↔b" appears.
The current ending point b becomes the new starting point a, "a→" lights continuously, and "b" flashes in the display.
2 Continue playing the track or press ▶▶ until you reach the new ending point (point b), then press A↔B again.
"a↔b" lights continuously and the deck starts playing repeatedly the newly specified portion.

Playing in Random Order (Shuffle Play)

You can have the deck "shuffle" tracks and play them in random order.



1 Press DECK A or DECK B to select the deck to be operated.

2 Press SHUFFLE when the deck is stopped.
"SHUF" appears in the display.

3 Press ▷ to start Shuffle Play.
"Shuffle" appears in the display while the deck is "shuffling" the tracks.

To cancel Shuffle Play

Press CONTINUE when the deck is stopped so that "SHUF" disappears.

You can specify tracks during Shuffle Play

- To play the next track, press ▶▶| (or turn AMS clockwise).
- To play from the beginning of the current track again, press |◀◀ (or turn AMS counterclockwise). You cannot use |◀◀ (or AMS) to go to tracks that have already been played.

You can also use the controls on the deck to set the Shuffle Play mode

1 Press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "PLAY MODE", then press AMS.
3 Turn AMS to select "SHUFFLE", then press AMS.
4 Press ▷ to start Shuffle Play.

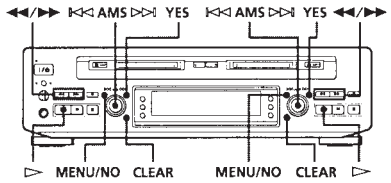
To cancel Shuffle Play, select "CONTINUE" in Step 3 above.

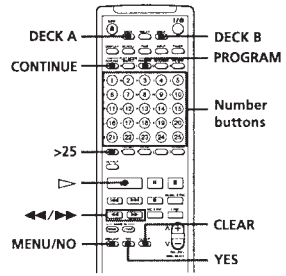
Creating Your Own Program (Program Play)

You can specify the playback order of the tracks on an MD and create your own programs containing up to 25 tracks.
When using the remote, press DECK A or DECK B to select the deck to be operated.

Note

You cannot create a program containing tracks from both deck A and deck B.





1 While the deck is stopped, press MENU/NO twice to display SET UP menu.

2 Turn AMS to display "PROGRAM", then press AMS (or YES).

3 Do either **a)** or **b)** to create a program:

a) When using the controls on the deck

1 Turn AMS until the track number you want appears in the display.
2 Press AMS.

If you enter the wrong track number

Press ◀◀ or ▶▶ until the wrong track number flashes, turn AMS to set the correct track number, then press AMS.

b) When using the remote

Press the number buttons to enter the tracks you want to program in the order you want.
To program a track with a number over 25, use the >25 button (see page 25).

If you enter the wrong track number

Press ◀◀ or ▶▶ until the wrong track number flashes, then enter the correct track number with the number buttons.

4 Repeat Step 3 to enter other tracks.
The entered track is added to the location where the "␣" (cursor) flashes.
Each time you enter a track, the total program time is added up and appears in the display.

5 After finishing programming, press YES.
"Complete" appears and programming is completed.

6 Set the Program Play mode.

a) When using the controls on the deck

1 Press MENU/NO twice to display SET UP menu.
2 Turn AMS to select "PLAY MODE", then press AMS.
3 Turn AMS to select "PROGRAM", then press AMS.
"PGM" appears in the display.

b) When using the remote

Press PROGRAM so that "PGM" appears in the display.

7 Press ▷ to start Program Play.

To cancel Program Play

While the deck is stopped, select "CONTINUE" instead of "PROGRAM" in Step 6 above (or press CONTINUE on the remote).
"PGM" disappears.

The program remains even after Program Play ends

When you press ▷, you can play the same program again.

(Continued)

Notes

- The display shows "- -m - -s" instead of the total playing time when the total playing time of the program exceeds 199 minutes.
- "Program Full" appears when you program over 25 tracks. Erase the unnecessary tracks to enter other tracks.

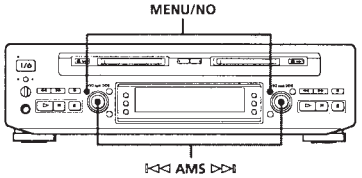
Changing the track order

You can change the order of the tracks in your program before you start playing.

To		Do the following procedure after Steps 1 and 2 in "Creating Your Own Program":
Erase	a track	Press ◀◀ or ▶▶ until the track number you want to erase flashes, then press CLEAR.
	the whole program	Keep pressing CLEAR until all programmed track numbers disappear.
Add a track	to the beginning of the program	1 Press ◀◀ until "␣" (cursor) flashes at the left of the first track. 2 Do Steps 3 to 5 on page 29.
	in the middle of the program	1 Press ◀◀ or ▶▶ until the track which precedes the track to be added flashes. 2 Press AMS so that "␣" (cursor) flashes, then do Steps 3 to 5 on page 29.
	to the end of the program	1 Press ◀◀ until "␣" (cursor) flashes at the right of the last track. 2 Do Steps 3 to 5 on page 29.
Change a track in the program		1 Press ◀◀ or ▶▶ until the track number you want to change flashes. 2 Do Steps 3 to 5 on page 29.

Changing the Pitch (Pitch Control Function)

You can change the MD playback speed (pitch). The tone rises at higher pitches, and falls at lower pitches.



1 While the deck is playing, press MENU/NO twice to display SET UP menu.

2 Turn AMS to select "PITCH", then press AMS.

3 Turn AMS to change the pitch within a range of –98.5% to +12.5% (in 0.1% steps), then press AMS. When you press CLEAR, the setting returns to the initial value (0%).

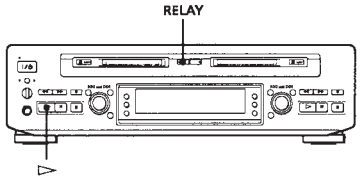
4 Press MENU/NO.

Notes

- When you change the pitch, the playback sound drops out momentarily.
- The pitch setting returns to the initial value (0%) when you turn off the deck or eject the MD.

Playing Two MDs Continuously (Relay Play)

You can have the deck play two MDs in succession from deck A to deck B in any play mode.



1 Insert MDs into both decks.

2 Press RELAY.
The RELAY indicator turns on.

3 Select the play mode you want according to the table below.

To play in	Select in SET UP menu "PLAY MODE" (or press on the remote)
Normal play (page 13)	CONTINUE
Shuffle Play (page 28)	SHUFFLE
Program Play (page 29)	PROGRAM

When "REP" or "REP 1" appears in the display, select "OFF" in SET UP menu "REPEAT" or press REPEAT on the remote until "REP" or "REP 1" disappears (see pages 26 and 27).

4 Press ▷ on deck A to start playing.
When playback on deck A finishes, playback on deck B (which is currently stopped) begins automatically.

To stop Relay Play

Press ■ on the deck which is playing.

To cancel Relay Play

Press RELAY to turn off the RELAY indicator.

Notes

- You cannot do Relay Play while deck B is playing, recording or editing.
- If you change the pitch during Relay Play, the pitch changes in the same manner for both deck A and deck B. The pitch setting returns to the initial value (0%) when you turn the deck off or eject the MDs from both deck A and deck B.
- While the RELAY indicator is on, the play mode changes in the same manner for both deck A and deck B.
- If you set either deck to "REPEAT ALL" during Relay Play, playback repeats continuously in the order of deck A → deck B → deck A → deck B → deck A ....

Editing Recorded MDs

Notes on Editing

You can edit the recorded tracks after recording, using the following functions:

- Erase Function allows you to erase recorded tracks simply by specifying the corresponding track number.
- a-b Erase Function allows you to specify a portion within a track to erase it.
- Divide Function allows you to divide tracks at specified points so that you can quickly locate those points afterwards, using the AMS function.
- Combine Function allows you to combine two consecutive tracks into one.
- Move Function allows you to change the order of tracks by moving a specific track to a track position you want.
- Name Function allows you to create and edit titles for your recorded MDs and tracks.
- Undo Function allows you to cancel the last edit.
- All Move Function allows you to move the contents of an entire MD to another MD.
- 1Tr Move Function allows you to move a single track on an MD to the end of the recorded portion on another MD.
- Name Copy Function allows you to copy titles between two MDs.

To enter EDIT menu

1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.
2 Turn AMS to select the desired editing function, then press AMS.

Note

Be sure to use the controls for the deck containing the MD you want to edit. When using the remote, press DECK A or DECK B to select the deck to be operated.

If "Protected" and "Cannot Edit" appear in the display

The deck could not edit because the record-protect slot on the MD is open. Edit after closing the slot.

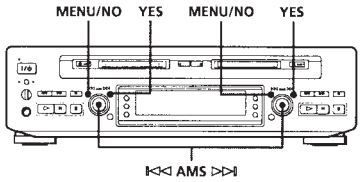
When "TOC" and "TOC Writing" appear in the display

Do not move the deck or pull out the AC power cord. After editing, "TOC" lights continuously until you eject the MD or turn off the deck. "TOC" and "TOC Writing" appear while the deck is updating the TOC. When the deck finishes updating the TOC, "TOC" goes off.

Erasing Recordings (Erase Function)

Do the procedures below to erase following:

- A single track (Tr Erase)
- All tracks (All Erase)

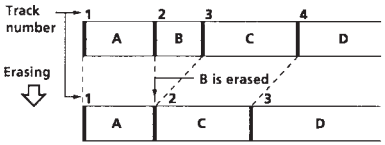


Erasing a single track (Tr Erase)

You can erase a track simply by specifying the respective track number. When you erase a track, the total number of tracks on the MD decreases by one and all tracks following the erased one are renumbered. Since erasing merely updates the TOC, there is no need to record over material.

To avoid confusion when erasing multiple tracks, you should proceed in order of high to low track number to prevent the renumbering of tracks that have not been erased yet.

Example: Erasing B



1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS until "Tr Erase" appears in the display.

3 Press AMS or YES.
The display for erasing tracks appears and playback of the displayed track starts.

4 Turn AMS to select the track to be erased.

5 Press AMS or YES.
When the track selected in Step 4 has been erased, "Complete" appears for a few seconds.
The track following the erased track begins playing. (If you erase the last track, the track preceding the erased track starts playing.)

6 Repeat Steps 1 to 5 to erase more tracks.

To cancel the Tr Erase Function

Press MENU/NO or ■.

Erasing all tracks on an MD (All Erase)

Erasing a recordable MD deletes the disc name, all recorded tracks, and titles.

1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS until "All Erase" appears in the display.

3 Press AMS or YES.
"All Erase??" appears in the display.

4 Press AMS or YES.
When the disc name, all recorded tracks, and titles on the MD have been erased, "Complete" appears for a few seconds.

To cancel the All Erase Function

Press MENU/NO or ■ to turn off the "All Erase??" indication.

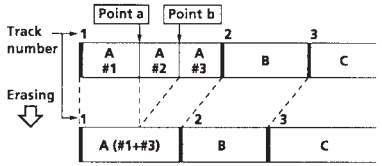
You can undo the Erase Function

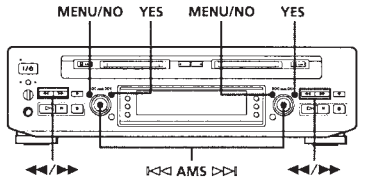
Use the Undo Function immediately after you erased the track (see page 41).

Erasing a Part of a Track (a-b Erase Function)

You can specify a portion within a track and erase the portion with ease. It is convenient when erasing unnecessary sections after recording satellite broadcast or FM broadcast.

Example: Erasing a part of track A





1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS until "a-b Erase" appears in the display, then press AMS or YES.

3 Turn AMS to select the number of the track, then press AMS or YES.
"–Rehearsal–" and "Point a ok?" alternates in the display while the deck plays back the selected track from the beginning.

(Continued)

Editing Recorded MDs

4 While monitoring the sound, turn AMS to find the starting point of the portion to be erased (point a). You can select the unit ("f", "s" or "m") by which the starting point is shifted.
Press ◀◀ or ▶▶ to select frame* "f", second "s", or minute "m", then turn AMS to change the starting point.
* 1 frame is about 12 ms.

5 If the point a is still incorrect, repeat Step 4 until it is correct.

6 Press AMS or YES if the position is correct.
"Point b Set!" appears in the display and playback for setting the end point of the portion to be erased (point b) starts.

7 Continue playback (or press ◀◀ or ▶▶) until the deck reaches point b, then press AMS or YES.
"–Rehearsal–" and "Point b ok?" alternates in the display while the deck repeats a portion of a few seconds before point a and after point b successively.

8 Repeat Step 4 if point b is not correct.

9 Press AMS or YES when the position is correct.
"Complete" appears for a few seconds and the portion between point a and b is erased.

To cancel the a-b Erase Function

Press MENU/NO or ■.

You can undo the a-b Erase Function
Use the Undo Function immediately after you erased the part of the track (see page 41).

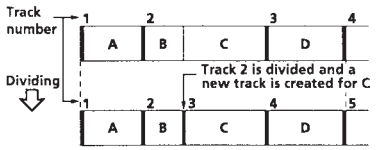
Note

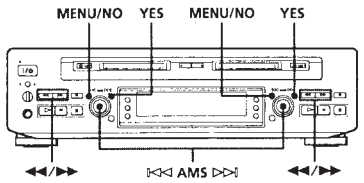
If "Impossible" appears in the display, this means:
– You specified point b comes before point a.
Point b should be specified after point a.
– The specified portion cannot be erased.
This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Dividing Recorded Tracks (Divide Function)

With the Divide Function you can mark a track number at places that you want to randomly access afterwards. Use this function to add tracks to MDs recorded from an analog source (and therefore contain no track numbers), or to divide an existing track into multiple portions for locating positions in the middle of a track. When you divide a track, the total number of tracks on the MD increases by one and all tracks following the divided track are renumbered.

Example: Dividing track 2 to create a new track for C



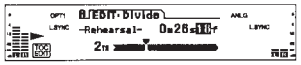


Dividing a track after selecting the track

1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS until "Divide" appears in the display, then press AMS or YES.

3 Turn AMS to select the track to be divided and press AMS or YES.
"–Rehearsal–" appears in the display and the deck plays back the selected track from the beginning.



4 While monitoring the sound, turn AMS to find the point to divide the track.
You can select the unit ("f", "s" or "m") by which the point to divide the track is shifted.
Press ◀◀ or ▶▶ to select frame "f", second "s", or minute "m", then turn AMS to change the point to divide the track.

5 Press AMS or YES when the position is correct.
"Complete" appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled.

To cancel the Divide Function

Press MENU/NO or ■.

You can undo the Divide Function
Use the Undo Function immediately after you divided the track (see page 41).

You can divide a track while recording
Mark the track numbers manually or use the Level Synchro Function (see page 17).

Dividing a track after selecting the dividing point

1 While playing the MD, press AMS at the point where you want to create a new track.
"–Rehearsal–" appears in the display and playback continues from the position you selected.

2 To make fine adjustment on the dividing position, do Step 4 in "Dividing a track after selecting the track" on this page.

3 Press YES.
"Complete" appears for a few seconds and the newly created track begins playing.

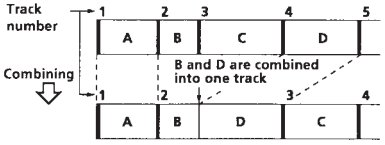
To cancel the Divide Function

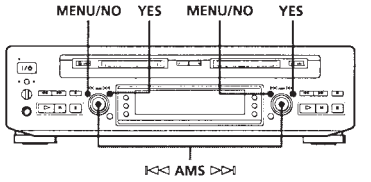
Press AMS, MENU/NO or ■.

Combining Recorded Tracks (Combine Function)

Use the Combine Function to combine tracks on a recorded MD. The two tracks to be combined need not to be consecutive and the latter track to be combined can be the track which comes before the former one in the track number order. This function is useful for combining several songs into a single medley, or several independently recorded portions into a single track. When you combine two tracks, the total number of tracks decreases by one and all tracks following the combined tracks are renumbered.

Example: Combining B and D



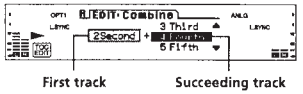


1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS to select "Combine", then press AMS or YES.

(Continued)

3 Turn AMS to select the first track of the two to be combined and press AMS or YES.
The display for selecting the second track appears and the deck repeats the portion where the two tracks will join (i.e., the end of the first track and the beginning of the succeeding track).



4 Turn AMS to select the second track of the two to be combined and press AMS or YES.
"Complete" appears for a few seconds.
If both of the combined tracks have track titles, the title of the second track is erased.

To cancel the Combine Function

Press MENU/NO or ■.

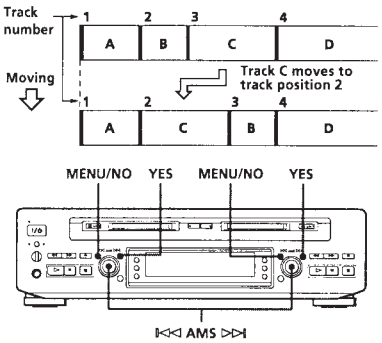
You can undo the Combine Function
Use the Undo Function immediately after you combined the tracks (see page 41).

Note
If "Impossible" appears in the display, the tracks cannot be combined. This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Moving Recorded Tracks (Move Function)

Use the Move Function to change the order of any track within an MD. After you move a track, the track numbers between the new and old track positions are automatically renumbered.

Example: Moving track C to track position 2

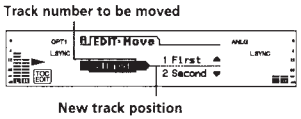


1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS to select "Move", then press AMS or YES.

3 Turn AMS to select the track to be moved and press AMS or YES.

4 Turn AMS until the new track position appears.



5 Press AMS or YES.
"Complete" appears for a few seconds and the moved track begins playing back.

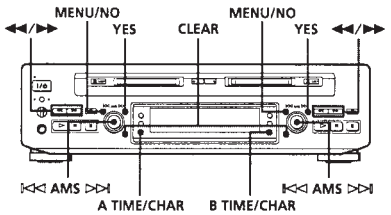
To cancel the Move Function

Press MENU/NO or ■.

You can undo the Move Function
Use the Undo Function immediately after you moved the track (see page 41).

Labeling Recordings (Name Function)

You can create titles for your recorded MDs and tracks. Titles — which may consist of uppercase and lowercase letters, numbers and symbols for a maximum of about 1,700 characters per disc — appear in the display during MD operation. You can also use the remote to label a track or an MD (see "Labeling tracks and MDs with the remote" on page 39).



Use the following procedure to label a track or an MD. **You can label a track while it is playing, pausing or recording. If the track is recording, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.**

1 Press MENU/NO to display EDIT menu.

2 Turn AMS until "Name" appears in the display and press AMS or YES.
Skip this step while recording.

3 Turn AMS until "Name In" appears in the display, then press AMS or YES.

4 Turn AMS to select "Disc" to label an MD, or to specify the track to label.
While recording, go to Step 6.

(Continued)

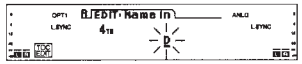
5 Press AMS or YES.
A flashing cursor appears in the display.

6 Press A TIME/CHAR or B TIME/CHAR to select the character type as follows:

To select	Press A TIME/CHAR or B TIME/CHAR repeatedly until
Uppercase letters	"A" appears in the display
Lowercase letters	"a" appears in the display
Numbers	"0" appears in the display

7 Turn AMS to select the character.
The selected character flashes.
Letters, numbers, and symbols appear in sequential order as you turn AMS.
You can use the following symbols in titles:

! " # $ % & ' ( ) * + , - . / : ; < = > ? @ _ `



You can press A TIME/CHAR or B TIME/CHAR to change the character type at any time during Step 7 (see Step 6).

8 Press AMS to enter the selected character.
The selected character lights continuously and the cursor flashes waiting for the input of the next character.

9 Repeat Steps 7 and 8 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing, and repeat Steps 7 and 8 to enter the correct character.

To erase a character
Press ◀◀ or ▶▶ until the character to be erased starts flashing, then press CLEAR.

To enter a space
Press AMS while the cursor is flashing.

10 Press YES.
This completes the labeling procedure and the title appears in the display.

To cancel labeling
Press MENU/NO or ■.

Note
You cannot label a track or an MD while you are recording over an existing track.

Copying a track or disc title within an MD (Name Copy)

You can copy a track or disc title to use it as a title of another track or the disc title within a disc. Note that you can do this operation by using the controls on the deck only.
See page 43 to copy a track or disc title between two MDs.

1 Press MENU/NO to display EDIT menu.

2 Turn AMS to select "Name", then press AMS or YES.

3 Turn AMS to select "Name Copy", then press AMS or YES.

4 Turn AMS to select "Disc" to copy the disc title, or the track whose title you want to copy and press AMS or YES.

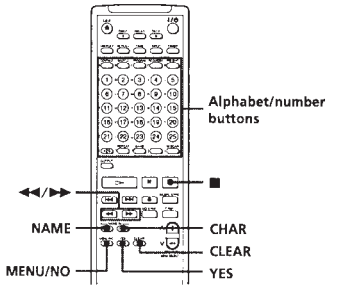
If "No Name!!" appears in the display
The disc or the track has no name.

5 Turn AMS to select "Disc" for disc title or to specify the track number to copy a title, and press AMS or YES.
"Complete" appears for a few seconds to indicate that the copying operation is completed.

If "Name Over Write??" appears in the display
The disc or track you selected already has a title. If you continue the title copying, press AMS or YES.

To cancel the Name Copy Function
Press MENU/NO or ■.

Labeling tracks and MDs with the remote



1 Press NAME.
A flashing cursor appears in the display, then do the following:

To label	Make sure that the deck is
A track	Playing, pausing, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

2 Press CHAR repeatedly to select the character type as follows:

To select	Press CHAR repeatedly until
Uppercase letters	"ABC" appears in the display
Lowercase letters	"abc" appears in the display
Numbers	"123" appears in the display

3 Press an alphabet/number button to enter a character.
After you enter a character, the cursor shifts rightward and waits for the input of the next character.
You can change the character type at any time during Step 3 (see Step 2).

(Continued)

4 Repeat Step 3 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing.
Press CLEAR to erase the incorrect character, then enter the correct one.

5 Press NAME again.
This completes the labeling procedure and the title appears in the display.

To cancel labeling
Press MENU/NO or ■.

Changing an existing title

1 Press NAME, then do the following:

To change	Make sure that the deck is
A track title	Playing, pausing the track whose title is to be changed, or stopped after locating the track whose title is to be changed
A disc name	Stopped with no track number appearing in the display

2 Hold down CLEAR until the current title is erased.

3 Enter the new title.
Do Steps 6 to 9 of "Labeling Recordings" on page 38, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on page 39 and this page.

4 Press NAME.

Erasing a title on a disc (Name Erase)

Use this function to erase a title on a disc.

1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS to select "Name", then press AMS or YES.

3 Turn AMS to select "Name Erase", then press AMS or YES.

4 Turn AMS to select "Disc" to erase the disc title, or the track whose title you want to erase and press AMS or YES.
"Complete" appears for a few seconds and the title is erased.

To cancel the Name Erase Function
Press MENU/NO or ■.

Erasing all titles on an MD (Name All Erase)

Use this function to erase all titles on an MD simultaneously.

1 While the deck is stopped, playing, or pausing, press MENU/NO to display EDIT menu.

2 Turn AMS to select "Name", then press AMS or YES.

3 Turn AMS to select "Name All Erase", then press AMS or YES.
"Name All Erase??" appears in the display.

4 Press AMS or YES again.
"Complete" appears for a few seconds and all titles are erased.

To cancel the Name All Erase Function
Press MENU/NO or ■.

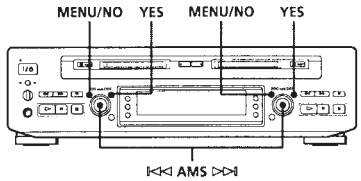
You can undo the Name Erase Function and the Name All Erase Function
See "Undoing the Last Edit" on page 41.

You can erase all recorded tracks and titles
See "Erasing all tracks on an MD" on page 33.

Undoing the Last Edit (Undo Function)

You can use the Undo Function to cancel the last edit and restore the contents of the MD to the condition that existed before editing was done. Note, however, that you cannot undo an edit if you do any of the following after the edit:

- Press the ● REC button on the deck.
- Press the ● button or the MUSIC SYNC button on the remote.
- Update the TOC by turning off the deck or ejecting the MD.
- Disconnect the AC power cord.



1 With the deck stopped and no track number appearing in the display, press MENU/NO to display EDIT menu.

2 Turn AMS until "Undo" appears in the display.
"Undo" does not appear if no editing has been done.

3 Press AMS or YES.
One of the following messages appears in the display, depending on the type of editing to be undone:

Editing done:	Message:
Erasing a single track	"Erase Undo ?"
Erasing all tracks on an MD	
Erasing a part of a track	
Dividing a track	"Divide Undo ?"
Combining tracks	"Combine Undo ?"
Moving a track	"Move Undo ?"
Labeling a track or an MD	"Name Undo ?"
Changing an existing title	
Erasing all titles on an MD	
Copying a title within an MD	

4 Press AMS or YES again.
"Complete" appears for a few seconds and the contents of the MD are restored to the condition that existed before the edit.

To cancel the Undo Function
Press MENU/NO or ■.

Editing Recorded MDs

Editing Between Two MDs

You can do a special edit (Disc→Disc) between two MDs in deck A and deck B, using the following functions:

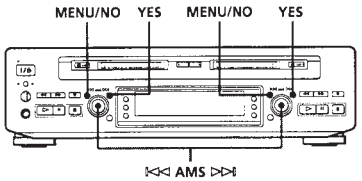
- All Move Function
- 1Tr Move Function
- Name Copy Function

Note that you cannot use the Undo Function (page 41) to return to the previous condition for these special edits.

Moving the contents of an entire MD (All Move Function)

This function can reorganize the TOC of an MD that has been edited repeatedly, while moving the contents of that MD to another MD. (The TOC includes the information such as track numbers and the order of tracks, etc.)

Reorganizing the contents of an MD reduces battery power consumption when listening to the MD on a portable MD player, and increases the amount of time available for recording on the MD. You can move the contents in either direction between deck A and deck B.



1 While the deck is stopped, press MENU/NO on deck A to display EDIT menu.
The contents of an MD in deck A move to an MD in deck B. To move the contents from deck B to deck A, press MENU/NO on deck B.

2 Turn AMS to select "Disc→Disc", then press AMS or YES.

3 Turn AMS to select "All Move", then press AMS or YES.
"OK??" starts flashing.

4 Press AMS or YES.
The contents of an MD in deck A are moved to an MD in deck B and disappear from deck A.
While moving the contents, the deck performs high-speed playback and the volume may fall or the sound may drop out. However, this is not a problem.
Moving the contents takes approximately 1/4 of the total playing time of all recorded tracks on the MD.
When the deck finishes moving the contents, "Complete" appears for a few seconds.

To cancel the All Move Function
Press MENU/NO or ■ before Step 4.

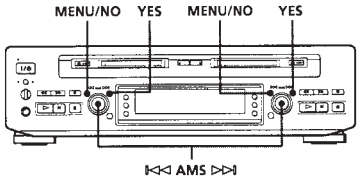
If the MD to which the contents of another MD are moved already has a disc name, the disc name is not overwritten.

Notes

- Be sure to use a blank disc to which the contents are moved using the All Move Function.
- You cannot use the All Move Function, if the total playing time of the MD to be moved is longer than that of the MD to which the contents are moved.
- Once you have moved the contents of an entire MD using the All Move Function, you cannot return to the previous condition even if you use the Undo Function on page 41.

Moving recorded tracks between two MDs (1Tr Move Function)

Use the 1Tr Move Function to move any track on the MD in deck A to the end of the recorded portion on the MD in deck B. You can also move any track from deck B to deck A.



1 While the deck is stopped, playing, or pausing, press MENU/NO on deck A to display EDIT menu.
To move a track from deck B to deck A, press MENU/NO on deck B.

2 Turn AMS to select "Disc→Disc", then press AMS or YES.

3 Turn AMS to select "1Tr Move", then press AMS or YES.

4 Turn AMS to select the track to be moved and press AMS or YES.
The moved track begins playing back.
While moving a track, the deck performs high-speed playback and the volume may fall or the sound may drop out. However, this is not a problem.
Moving a track takes approximately 1/4 of the playing time of the track to be moved.
When the deck finishes moving a track, "Complete" appears for a few seconds.

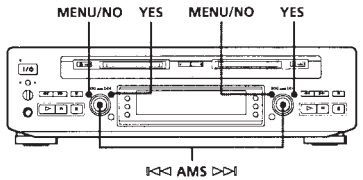
To cancel the 1Tr Move Function
Press MENU/NO or ■ before Step 4.

Notes

- Once you have moved a track using the 1Tr Move Function, you cannot return to the previous condition even if you use the Undo Function on page 41.
- If "Impossible" appears in the display, the track cannot be moved. This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.
- If you move a short track, a slight portion at the end of the track may disappear.

Copying a track or disc title between two MDs (Name Copy Function)

You can copy a track or the disc title of the MD in deck A to use it as a title of another track or the disc title of the MD in deck B. You can also copy a track or the disc title from deck B to deck A.



1 While the deck is stopped, press MENU/NO on deck A to display EDIT menu.
To copy a track title or the disc title from deck B to deck A, press MENU/NO on deck B.

2 Turn AMS to select "Disc→Disc", then press AMS or YES.

3 Turn AMS to select "Name Copy", then press AMS or YES.

4 Turn AMS to select "Disc" to copy the disc title, or the track whose title you want to copy.

If "No Name!!" appears in the display
The disc or the track has no name.

5 Turn AMS to select "Disc" for disc title or to specify the track number to copy a title.

6 Press AMS or YES.
"Complete" appears for a few seconds to indicate that the copying operation is completed.

If "Name Over Write??" appears in the display
The disc or track you selected already has a title. If you continue the title copying, press AMS or YES.

To cancel the Name Copy Function
Press MENU/NO or ■ before Step 6.

Note
Once you have copied a track or the disc title between two MDs using the Name Copy Function, you cannot return to the previous condition even if you use the Undo Function on page 41.

Display Messages

The following table explains the various messages that appear in the display. Also, the deck has a Self-Diagnosis Function (see page 51).

Message	Meaning
Blank Disc	A new (blank) or erased MD has been inserted.
Cannot Copy	An attempt was made to make a second copy from a digitally dubbed MD (see page 47).
Cannot Edit	An attempt was made to edit the MD during Program or Shuffle Play.
Disc Full!!	The MD is full (see "System Limitations" on this page).
Impossible	The deck cannot do the specified editing operation, or while one deck is recording, an attempt was made to record on the other deck with the input set to an impossible combination (see page 8).
Name Full!!	The titling capacity of the MD has reached its limit (about 1,700 characters).
No Disc	There is no MD in the deck.
NO PROGRAM	The Program Play was selected in SET UP menu "PLAY MODE" when the program was not made.
Premastered	An attempt was made to record on the premastered MD.
Flashing clock indication	• The clock has not been set. • The contents recorded by timer have disappeared over time and are not be available for saving to disc, or Program Play could not be activated since the program has disappeared over time.
Edit Cancel	The editing operation was canceled.
Edit Error	Editing could not be performed properly so the editing operation was canceled.
No Name!!	The disc or track has not been labeled.
Off Time NG!	The TIMER OFF time is the same as the TIMER ON time.
Set Clock!!	The clock has not been set, so the timer cannot be set.
Set Timer!!	The timer has not been set.
No Date!!	The recording date and time have not been recorded for the specified track.
Timer Cancel	The timer function was canceled.
Program Full	The program contains the maximum number of tracks. You cannot set additional tracks.
Check Rec Time!	There is not enough time remaining on the dubbing destination disc.

System Limitations

The recording system in your MiniDisc deck is radically different from those used in cassette and DAT decks and is characterized by the limitations described below. Note, however, that these limitations are due to the inherent nature of the MD recording system itself and not to mechanical causes.

"Disc Full!!" lights up even before the MD has reached the maximum recording time (60 or 74 minutes)
When 255 tracks have been recorded on the MD, "Disc Full!!" lights up regardless of the total recorded time. More than 255 tracks cannot be recorded on the MD. To continue recording, erase unnecessary tracks or use another recordable MD.

"Disc Full!!" lights up before the maximum number of tracks is reached
Fluctuations in emphasis within tracks are sometimes interpreted as track intervals, incrementing the track count and causing "Disc Full!!" to light up.

The remaining recording time does not increase even after erasing numerous short tracks
Tracks under 12 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.

Some tracks cannot be combined with others
Track combination may become impossible when tracks are edited.

The total recorded time and the remaining time on the MD may not total the maximum recording time (60 or 74 minutes)
Recording is done in minimum units of 2 seconds each, no matter how short the material. The contents recorded may thus be shorter than the maximum recording capacity. Disc space may also be further reduced by scratches.

Tracks created through editing may exhibit sound dropout during search operations.

Track numbers are not recorded correctly
Incorrect assignment or recording of track numbers may result when CD tracks are divided into several smaller tracks during digital recording. Also, when the Level Synchro Function is activated during recording, track numbers may not marked as in the original depending on the program source.

"TOC Reading" appears for a long time
If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.

Limitations when recording over an existing track
- The correct remaining recording time may not be displayed.
- You may find it impossible to record over a track if that track has been recorded over several times already. If this happens, erase the track using the Erase Function (see page 32).
- The remaining recording time may be shortened out of proportion to the total recorded time.
- Recording over a track to eliminate noise is not recommended since this may shorten the duration of the track.
- You may find it impossible to label a track while recording over it.

The correct recorded/playing time may not be displayed during playback of monaural-format MDs.

Troubleshooting

If you experience any of the following difficulties while using the deck, use this troubleshooting guide to help you remedy the problem. Should any problem persist, consult your nearest Sony dealer.

The deck does not operate or operates poorly.
➡ The MD may be damaged ("Disc Error!!" appears). Take the MD out and insert it again.
If "Disc Error!!" remains, replace the MD.

The deck does not play back.
➡ Moisture has formed inside the deck. Take the MD out and leave the deck in a warm place for several hours until the moisture evaporates.
➡ The deck is not on. Press I/⏻ to turn the deck on.
➡ The MD is inserted in the wrong direction. Slide the MD into the disc slot with the label side up and the arrow pointing towards the opening.
➡ The MD may not be recorded. Replace the disc with one that has been recorded.

The deck does not record.
➡ The MD is record-protected ("Protected!!" and "C11" appear).
Close the record-protect slot (see page 10).
➡ The deck is not connected properly to the sound source. Make connections properly to the sound source.
➡ The recording level is not adjusted properly. Adjust the recording level properly (see page 9).
➡ A premastered MD is inserted. Replace it with a recordable MD.
➡ There is not enough time left on the MD. Replace it with another recordable MD with fewer recorded tracks, or erase unnecessary tracks.
➡ There has been a power failure or the AC power cord has been disconnected during recording. Data recorded to that point may be lost. Repeat the recording procedure.

The sound has a lot of static.
➡ Strong magnetism from a television or a similar device is interfering with operations. Move the deck away from the source of strong magnetism.

Cannot set the timer.
➡ The clock has not been set, or the clock setting has been lost due to a power failure, etc.
Set the clock (see page 6).

The deck cannot be operated during timer standby.
➡ You cannot operate the deck during timer standby. To operate the deck, press TIMER to cancel the timer function.

The timer does not function.
➡ The timer was not set before the deck was turned off. Press TIMER to display the clock indication.
➡ The incorrect time has been set. Check the starting and ending times, and set the correct times.

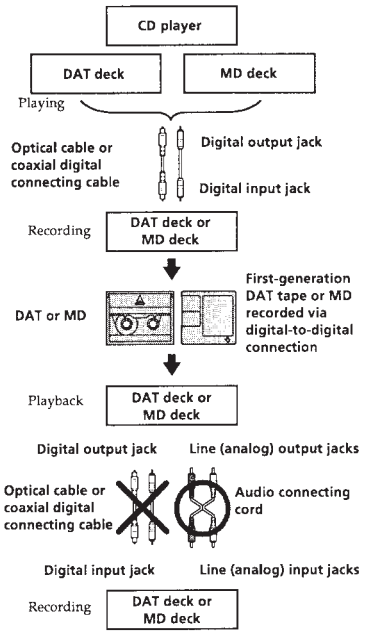
The three-digit display appears.
➡ The Self-Diagnosis Function is on.
Check the table on page 51.

Note
If the deck does not operate properly even after you've attempted the prescribed remedies, turn off the deck, then reinsert the plug into the power outlet.

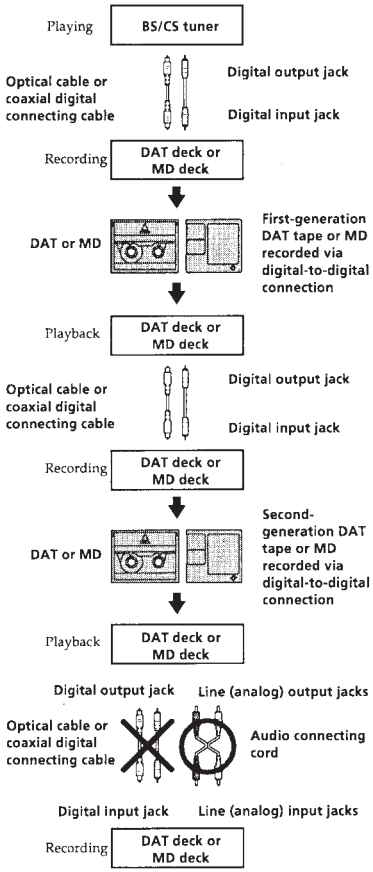
Guide to the Serial Copy Management System

This MD deck uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software via the deck's digital input jack. An outline of this system appears below:

1 You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via digital input jack on the DAT or MD deck.
You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD deck.



2 You can record the digital input signal of a digital satellite broadcast onto a DAT tape or recordable MD via the digital input jack on the DAT or MD deck which is capable of handling a sampling frequency of 32 kHz or 48 kHz.
You can then record the contents of this recorded DAT tape or MD (first-generation) onto another DAT tape or recordable MD via digital input jack on the DAT or MD deck to create a second-generation digital copy.
Subsequent recording from the second-generation copy onto another recordable DAT tape or MD is possible only through the analog input jack on the DAT or MD deck.
Note, however, that on some BS/CS tuners, second-generation digital copying may not be possible.



(Continued)

3 You can record a DAT tape or MD recorded via the DAT or MD deck's analog input jack onto another DAT tape or MD via the DAT or MD deck's digital output jack. You cannot, however, make a second-generation DAT tape or MD copy via the DAT or MD deck's digital output jack.

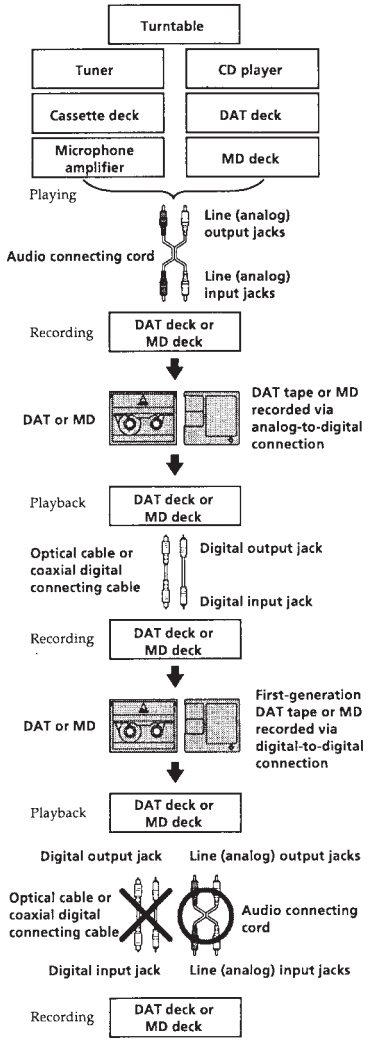


Table of Setup Menus

You can make various settings on this deck by using SET UP menus. Operation related to each menu were explained in the previous sections. The table below outlines each menu, including the various parameters and initial settings.

Note

The menus you can use while the deck is stopped, playing or recording differ.

To enter the SET UP menu

While the deck is stopped, press MENU/NO twice to display SET UP menu.

Menu	Function	Parameters	Initial setting	See
REPEAT	Sets the repeat play mode.	OFF/ALL/1	OFF	pages 26 and 27
PLAY MODE	Sets the play mode.	CONTINUE/SHUFFLE/ PROGRAM	CONTINUE	pages 28 and 29
PROGRAM	Creates a program.	—	—	page 29
MUSIC SCAN	Sets the playing time during music scan.	6s/10s/20s	6s	page 25
REC LVL	Adjusts the recording level.	–∞dB to +12.0dB	0dB	page 9
REC MODE	Sets the recording mode.	STEREO/MONO	STEREO	page 9
LEVEL SYNC	Sets the Level Synchro Function.	ON/OFF	ON	page 18
SMART SPACE	Sets the Smart Space and Auto Cut Functions.	ON/OFF	ON	page 16
PITCH	Sets the pitch during playback.	–98.5% to +12.5%	0%	page 30
TIMER REC	Sets the timer recording.	ONCE/WEEKLY	ONCE	page 21
OVERLAP REC	Performs the settings for Relay Recording.	ON/OFF	ON	page 20
CLOCK	Sets the clock (day/month/year/ hour/minute).	—	—	page 6

To reset to the initial setting

Press CLEAR while the respective SET UP menu is displayed.

Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three-digit display (a combination of a letter and figures) and the corresponding message, so you can check the deck's condition.
If such a display appears, check the following table in order to resolve the problem.
Should any problem persist, consult your nearest Sony dealer.

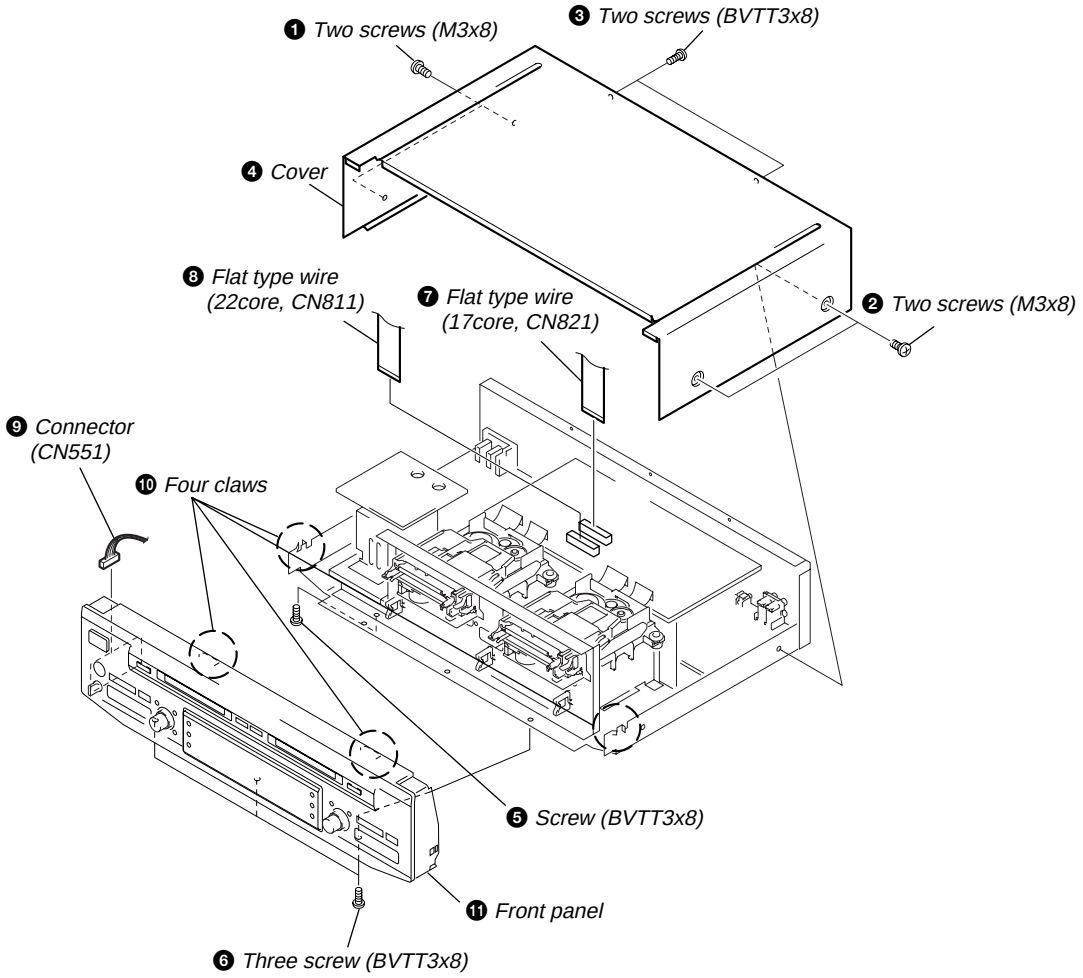
Self-diagnosis display

Three-digit display/Message	Cause/Remedy
C11/Protected!!	The inserted MD is record-protected. ➡ Take out the MD, and close the record-protect tab (page 10).
C13/REC Error!!	The recording was not made properly. ➡ Set the deck in a stable place, and repeat the recording procedure.
	The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➡ Replace the disc, and repeat the recording procedure.
C13/Disc Error!!	The deck could not read the TOC of the MD properly. ➡ Take out the MD, and insert it again.
C14/Disc Error!!	The deck could not read the TOC of the MD properly. ➡ Insert another disc. ➡ If possible, erase all tracks on the MD using the All Erase Function on page 33.
C71/Din Unlock ("C71" alternates with "Din Unlock" in the display.)	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material.
	While recording from a digital component connected through the digital input connector, the digital connecting cable was unplugged or the digital component turned off. ➡ Connect the cable or turn the digital component back on.

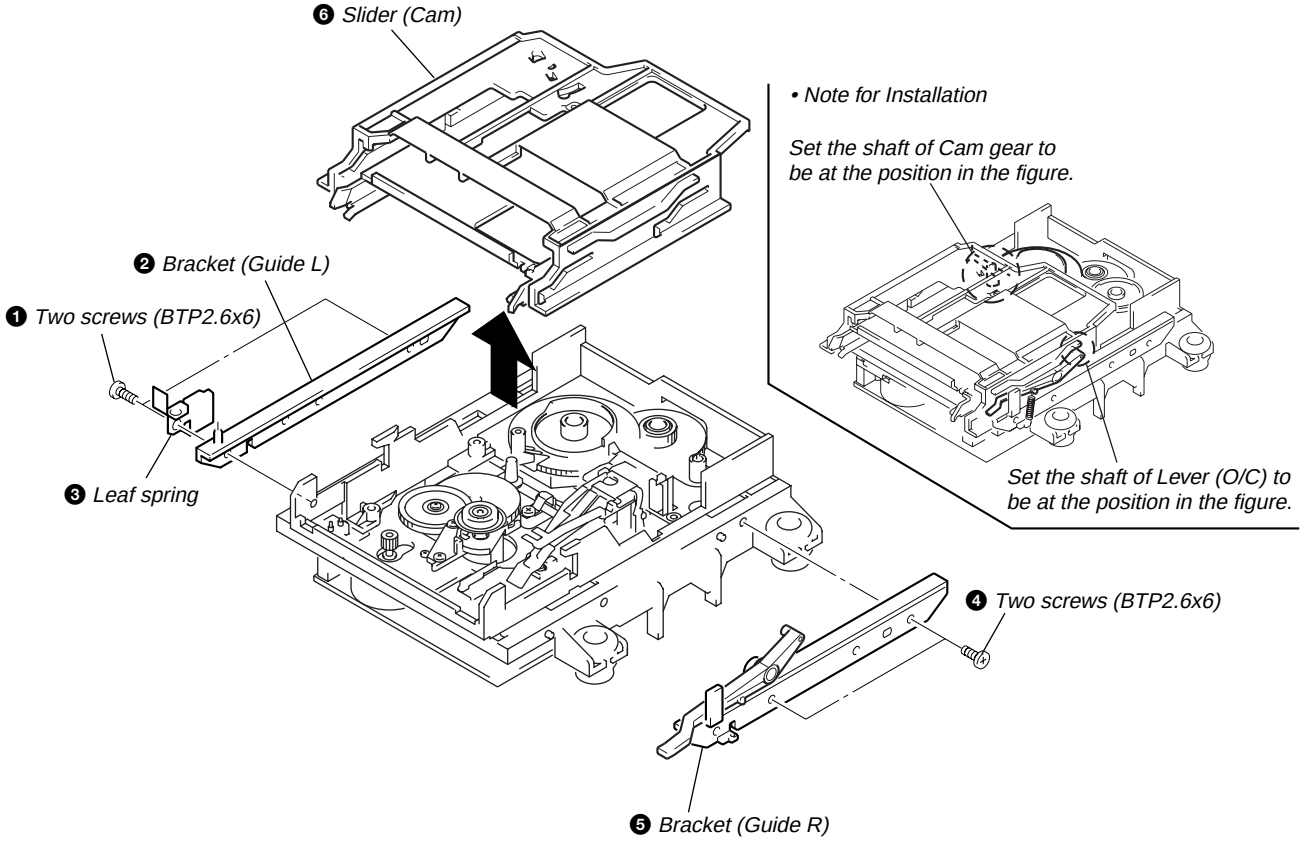
SECTION 3
DISASSEMBLY

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

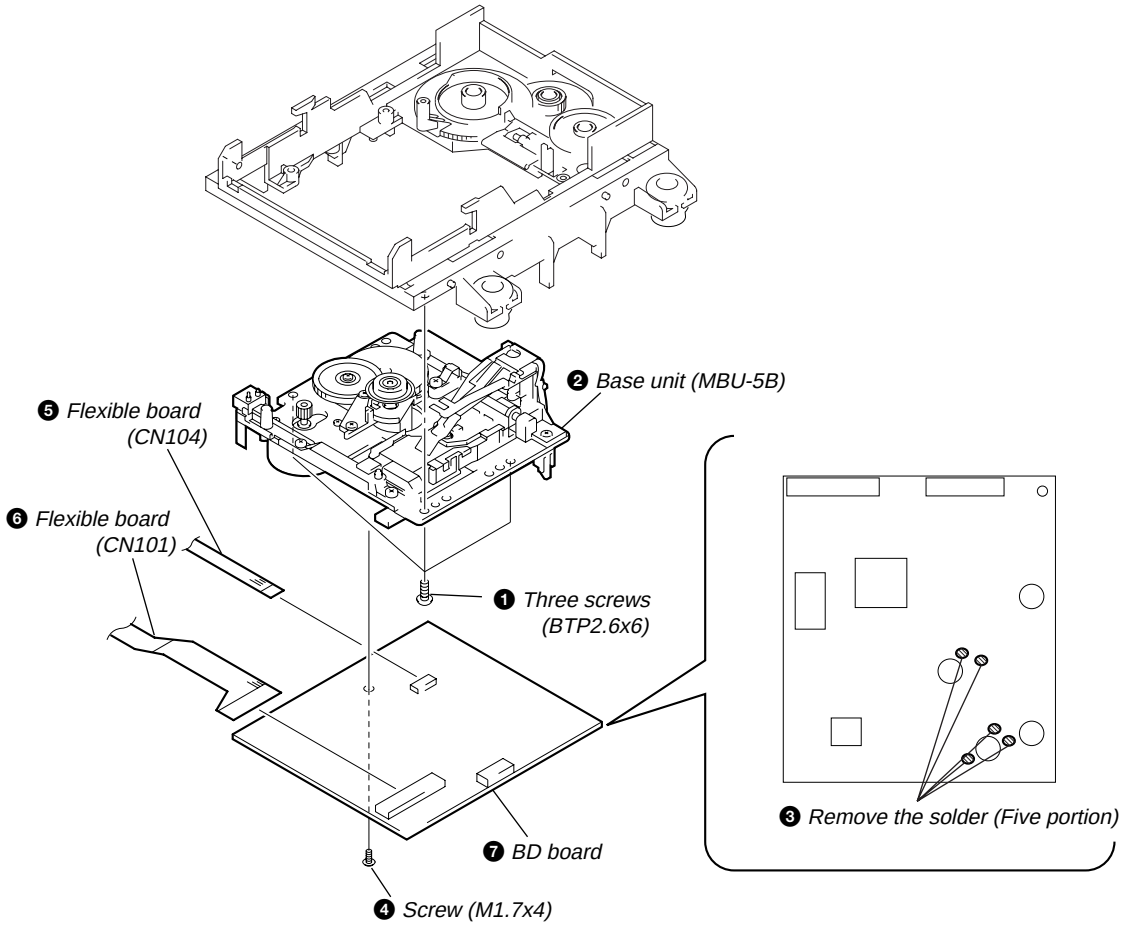
3-1. FRONT PANEL



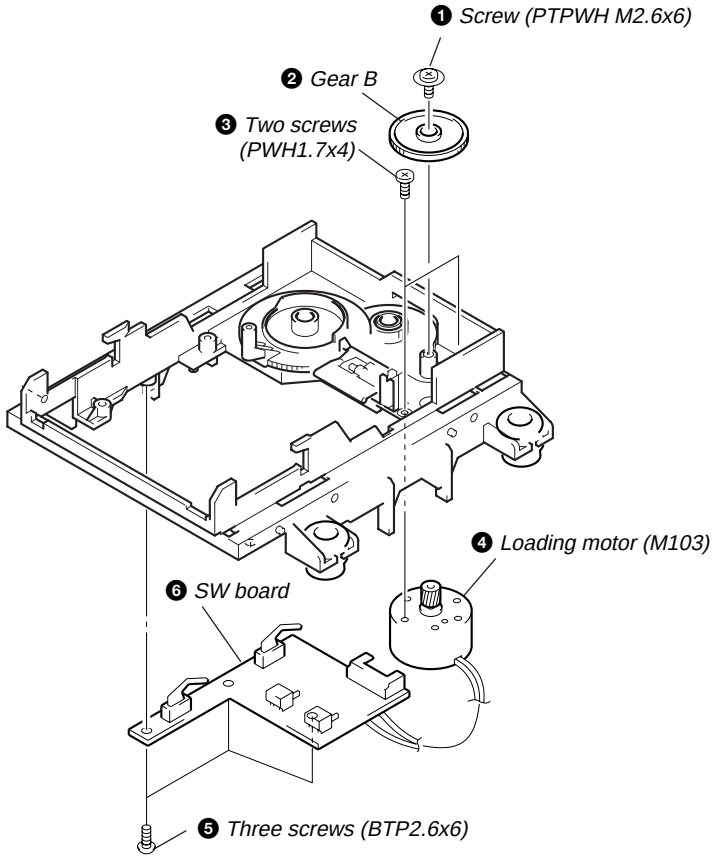
3-2. SLIDER (CAM)



3-3. BASE UNIT (MBU-5B) AND BD BOARD



3-4. SW BOARD AND LOADING MOTOR (M103)



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.

This unit uses two mechanism Deck A and Deck B.
The decks can be operated individually in the test mode.
For buttons or knobs not specified as (Deck A) or (Deck B) in the procedure, use that of the corresponding deck.

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

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

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: With the power ON, press the [◀◀ (Deck B)] button while pressing the [OUTPUT] and [CLEAR (Deck A)] buttons together. When the test mode is set, "(Check)" will be displayed. Rotating the [AMS] knob switches between the following four groups; ···⟷ Check ⟷ Adjust ⟷ Service ⟷ Develop ⟷ ···.

Procedure 2: With the power ON, press the [■ (Deck B)] button while pressing the [OUTPUT] and [CLEAR (Deck A)] buttons together. When the test mode is set, "TEMP CHECK" will be displayed. By setting the test mode using this method, only the "Check" group of procedure 1 can be executed.

4-3. EXITING THE TEST MODE

Press the [MD SYNC] button. The STANDBY state is set when the test mode is exited.

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

4-5. SELECTING THE TEST MODE

There are 31 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 items used for servicing can be treated using group S. So be carefully not to enter other groups by mistake.

Display	No	Contents	Mark	Group (∗)
TEMP CHECK	1	Temperature compensation offset check		C S
LDPWR CHECK	2	Laser power check		C S
EF MO CHECK	3	Traverse (MO) check		C S
EF CD CHECK	4	Traverse (CD) check		C S
FBIAS CHECK	5	Focus bias check		C S
S curve CHECK	6	S letter check	(X)	C
VERIFY MODE	7	Non-volatile memory check	(X)	C
DETRK CHECK	8	Detrack check	(X)	C
TEMP ADJUS	9	Temperature compensation offset adjustment		A S
LDPWR ADJUS	10	Laser power adjustment		A S
EF MO ADJUS	11	Traverse (MO) adjustment		A S
EF CD ADJUS	12	Traverse (CD) adjustment		A S
FBIAS ADJUS	13	Focus bias adjustment		A S
EEP MODE	14	Non-volatile memory control	(X) (!)	D
MANUAL CMD	15	Command transmission	(X)	D
SVDATA READ	16	Status display	(X)	D
ERR DP MODE	17	Error history display, clear		S
SLES MOVE	18	Sled check	(X)	D
ACCESS MODE	19	Access check	(X)	D
0920 CHECK	20	Outermost circumference check	(X)	D
HEAD ADJUST	21	Head position check	(X)	D
CPLAY2 MODE	22	Same functions as CPLAY MODE	(X)	D
CREC2 MODE	23	Same functions as CREC MODE	(X)	D
ADJ CLEAR	24	Initialization of non-volatile memory of adjustment value		A S
AG Set (MO)	25	Auto gain output level adjustment (MO)		A S
AG Set (CD)	26	Auto gain output level adjustment (CD)		A S
Iop Read	27	IOP data display		C S
Iop Write	28	IOP data write		A S
W1 @@@@@@	29	Microprocessing version display		C S
CPLAY MODE	30	Continuous play mode		C A S D
CREC MODE	31	Continuous recording mode		C A S D

Group (∗)
C: Check A: Adjust
S: Service D: Develop

- For details of each adjustment mode, refer to "5. Electrical Adjustments".
  For details of "ERR DP MODE", refer to "Self-Diagnosis Function" on page 2.
- If a different mode has been selected by mistake, press the MENU/NO button to 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. Be especially careful not to set the modes with (!) as they will overwrite the non-volatile memory and reset it, and as a result, the unit will not operate normally.

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 "CPLAY MODE" (S: 30).
   ③ Press the YES button to change the display to "CPLAY MID".
   ④ When access completes, the display changes to "C = □□□□ AD = □□".
   Note : The numbers "□" displayed show you error rates and ADER.
2. Changing the parts to be played back
   ① Press the YES button during continuous playback to change the display as below.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY 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 "CPLAY MODE".
   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 "CREC MODE".
   ③ Press the YES button to change the display to "CREC MID" (S: 31).
   ④ When access completes, the display changes to "CREC (□□□□" and **REC** lights up.
   Note : The numbers "□" displayed shows you the recording position addresses.
2. Changing the parts to be recorded
   ① When the YES button is pressed during continuous recording, the display changes as below.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY IN"
   When pressed another time, the parts to be recorded can be changed. **REC** goes off.
   ② When access completes, the display changes to "CREC (□□□□" and **REC** lights up.
   Note : The numbers "□" displayed shows you the recording position addresses.
3. Ending the continuous recording mode
   ① Press the MENU/NO button. The display changes to "CREC MODE" and **REC** goes off.
   ② Press the ⏏EJECT button 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.

4-5-3. Non-Volatile Memory Mode (EEP MODE)

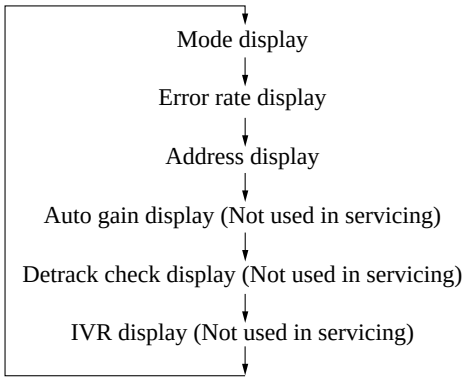
This mode reads and writes the contents of the non-volatile memory.
It is not used in servicing. If set accidentally, press the MENU/NO button immediately to exit it.

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.
SCROLL	Switches between the pit and groove modes when pressed.
PLAY MODE	Switches the spindle servo mode (CLVS ⟷ CLV A).
LEVEL/DISPLAY/CHAR	Switches the displayed contents each time the button is pressed
⏏ EJECT	Ejects the disc
MD SYNC	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.



1. Mode display

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

2. Error rate display

Displays the error rate in the following way.

C = □□□□ AD = □□

C = Indicates the C1 error.

AD = Indicates ADER.

3. Address display

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

Pressing the SCROLL button switches between the group display and bit display.

h = □□□□ s = □□□□ (MO pit and CD)

h = □□□□ a = □□□□ (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

Note: “–” is displayed when servo is not imposed.

4. Auto gain display (Not used in servicing)

The auto gain is displayed as follows.

AG = □□ / □□ [□□

5. Detrack check display (Not used in servicing)

The detrack is displayed as follows.

ADR = □□□□□□□

6. IVR display (Not used in servicing)

The IVR is displayed as follows.

(□□)(□□)(□□

MEANINGS OF OTHER DISPLAYS

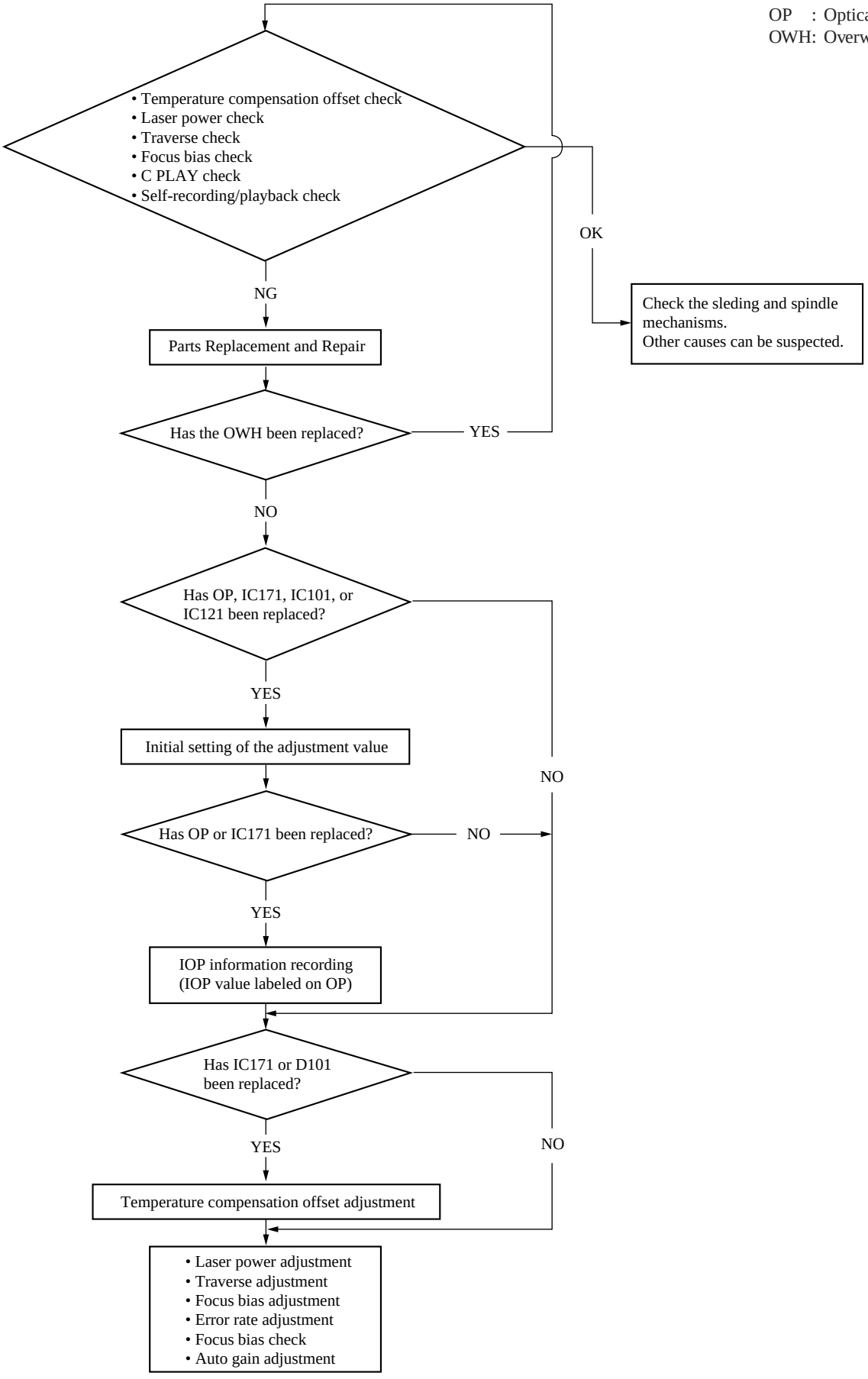
Display	Contents	
	When Lit	When Off
▷	During continuous playback (CLV: ON)	STOP (CLV: OFF)
▮▮	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
SYNC	CLV low speed mode	CLV normal mode
ANA	ABCD adjustment completed	Tracking offset cancel OFF
OVER	Tracking offset cancel ON	
OPT2	Tracking auto gain OK	
OPT1 A-B	Focus auto gain OK	
MONO	Pit	Groove
L.SYNC	High reflection	Low reflection
B-MD (Deck A) A-MD (Deck B)	CLV-S	CLV-A
LOCK	CLV LOCK	CLV UNLOCK

SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. PARTS REPLACEMENT AND ADJUSTMENT

• Check and adjust the MDM and MBU as follows.
The procedure changes according to the part replaced

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

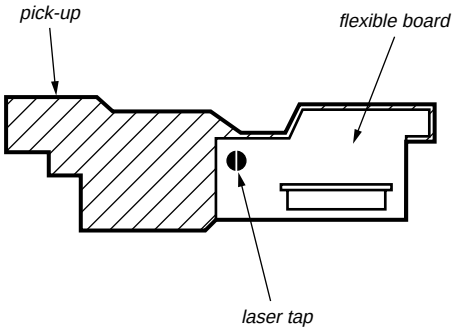


5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSINON

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-260A)

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

This unit uses two mechanism (Deck A) and (Deck B).
The decks can be operated individually.
For buttons or knobs not specified as Deck A or Deck B in the procedure, use that of the corresponding deck.

1) When replacing the following parts, perform the adjustments and checks with **O** in the order shown in the following table.

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

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/AU-1) (Parts No. 8-892-341-41)
- Laser power meter LPM-8001 (Parts No. J-2501-046-A)

or

MD Laser power meter 8010S (Parts No. J-2501-145-A) (Note)
- Oscilloscope (Measure after performing CAL of prove.)
- Digital voltmeter
- Thermometer
- Jig for checking BD board waveform
(Parts No. : J-2501-149-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.

Note : When performing laser power checks and adjustment (electrical adjustment), use of the new MD laser power meter 8010S (J-2501-145-A) instead of the conventional laser power meter is convenient.
It sharply reduces the time and trouble to set the laser power meter sensor onto the objective lens of the pick-up.

5-5. CREATING CONTINUOUSLY RECORDED DISC

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

1. Insert a disc (blank disc) commercially available.
2. Rotate the [AMS] knob and display "CREC MODE". (S: 31)
3. Press the [YES] button again to display "CREC 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.

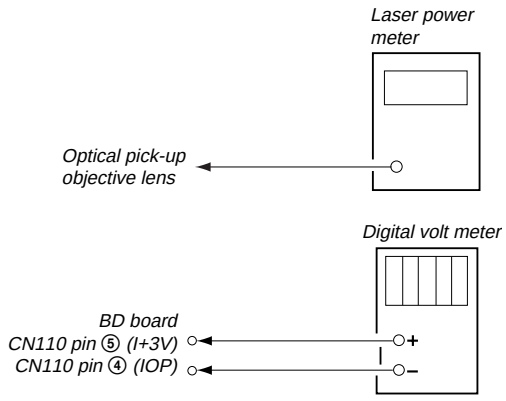
Checking Procedure:

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 CN110 pin ⑤ (I+3V) and CN110 pin ④ (IOP).
2. Then, rotate the AMS knob and display "LDPWR CHECK" (S: 2).
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)

KMS260A
27X40
B0825

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

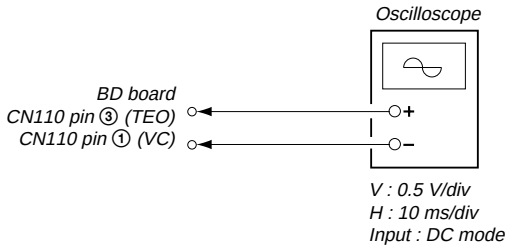
Iop = 82.5 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

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. Traverse Check

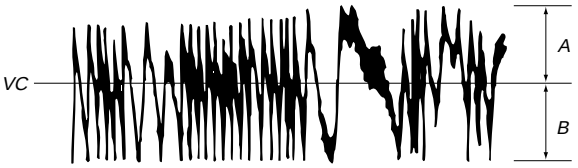
Connection :



Checking Procedure:

1. Connect an oscilloscope to CN110 pin ③ (TEO) and CN110 pin ① (VC) of the BD board.
2. Load a disc (any available on the market). (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"(S: 3).
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)

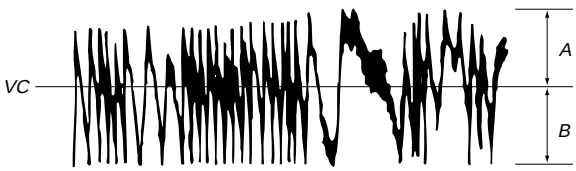


Specified value : Below 10% offset value

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

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)



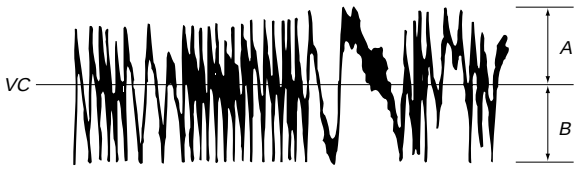
Specified value : Below 10% offset value

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

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)

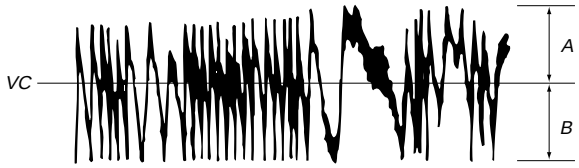


Specified value : Below 10% offset value

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

11. Press the YES button display “EF MO CHECK”
    The disc stops rotating automatically.
12. Press the ⏏EJECT button and remove the disc.
13. Load the check disc (MD) TDYS-1.
14. Roteto the AMS knob and display “EF CD CHECK” (S: 4).
15. Press the YES button and display “EFB = □□ CD”. Servo is imposed automatically.
16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the AMS knob.

(Traverse Waveform)



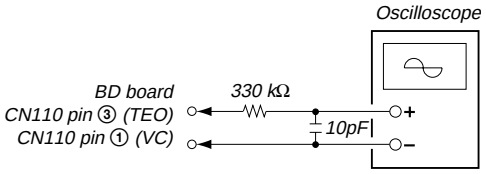
Specified value : Below 10% offset value

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

17. Press the YES button and display “EF CD CHECK”.
18. Press the ⏏EJECT button and remove the check disc (MD) TDYS-1.

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

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



5-6-4. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button twice and display “CPLAY MID”.
4. Press the MENU/NO button when “C = □□□□ AD = □□” is displayed.
5. Rotate the AMS knob and display “FBIAS CHECK” (S: 5).
6. 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 220 and ADER is below 2.
7. Press the YES button and display “ □□□□/□□ b = □□”.
   Check that the C1 error is below 220 and ADER is below 2.
8. Press the YES button and display “ □□□□/□□ a = □□”.
   Check that the C1 error is below 220 and ADER is below 2.
9. Press the MENU/NO button, next press the ⏏EJECT button, and remove the test disc.

5-6-5. C PLAY Checking

MO Error Rate Check

Checking Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button and display “CPLAY MID”.
4. The display changes to “C = □□□□ AD = □□”.
5. If the C1 error rate is below 80, check that ADER is below 2.
6. Press the MENU/NO button, stop playback, press the ⏏EJECT button, and test disc.

CD Error Rate Check

Checking Procedure :

1. Load a check disc (MD) TDYS-1.
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button twice and display “CPLAY MID”.
4. The display changes to “C = □□□□ AD = □□”.
5. Check that the C1 error rate is below 50.
6. Press the MENU/NO button, stop playback, press the ⏏EJECT button, and the test disc.

5-6-6. Self-Recording/playback Check

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

Checking Procedure :

1. Insert a recordable disc (blank disc) into the unit.
2. Rotate the AMS knob to display “CREC MODE” (S: 31).
3. Press the YES button to display the “CREC MID”.
4. When recording starts, “ **REC** ” is displayed, this becomes “CREC @@@@" (@@@@ is the address), and recording starts.
5. About 1 minute later, press the MENU/NO button to stop continuous recording.
6. Rotate the AMS knob to display “C PLAY MODE” (S: 30).
7. Press the YES button to display “C PLAY MID”.
8. “C = □□□□ AD = □□” will be displayed.
9. Check that the C1 error becomes below 80 and the AD error below 2.
10. Press the MENU/NO button to stop playback, and press the ⏏EJECT button and remove the disc.

5-7. INITIAL SETTING OF ADJUSTMENT VALUE

Note:
Mode which sets the adjustment results recorded in the non-volatile memory to the initial setting value. However the results of the temperature compensation offset adjustment will not change to the initial setting value.
If initial setting is performed, perform all adjustments again excluding the temperature compensation offset adjustment.
For details of the initial setting, refer to "5-4. Precautions on Adjustments" and execute the initial setting before the adjustment as required.

Setting Procedure :
1. Rotate the AMS knob to display "ADJ CLEAR (S: 24)".
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 pickup 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. With the power ON, press the ◀◀ (Deck B) button while pressing the OUTPUT and CLEAR (Deck A) buttons together.
2. Rotate the AMS knob to display "(Service)", and press the YES button.
3. Rotate the AMS knob to display "Iop.Write" (S: 28), 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" (S: 27).
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 ADJUTMENT

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.

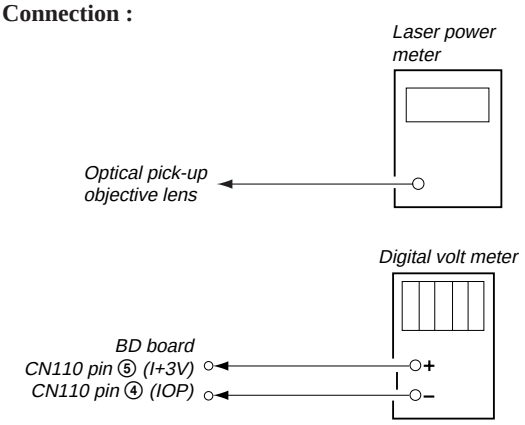
Adjusting Procedure :
1. Rotate the AMS knob and display "TEMP ADJUS".
2. Press the YES button and select the "TEMP ADJUS" mode.
3. "TEMP = □ (OK" and the current temperature data will be displayed.
4. To save the data, press the YES button.
   When not saving the data, press the MENU/NO button.
5. When the YES button is pressed, "TEMP = □ SAVE" will be displayed and turned back to "TEMP ADJUS" display then. When the MENU/NO button is pressed, "TEMP ADJUS" will be displayed immediatelly.

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

5-10. LASER POWER ADJUSTMENT

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

Connection :



Adjusting Procedure :
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀◀ button or ▶▶ button to move the optical pick-up.)
   Connect the digital volt meter to CN110 pin ⑤ (I+3V) and CN110 pin ④ (IOP).
2. Rotate the AMS knob and display "LDPWR ADJUS" (S: 10). (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.

7. Then, rotate the AMS knob and display “LDPWR CHECK” (S: 2).
8. 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.
9. 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 ± 0.1 mW
Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

KMS260A
27X40
B0825

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

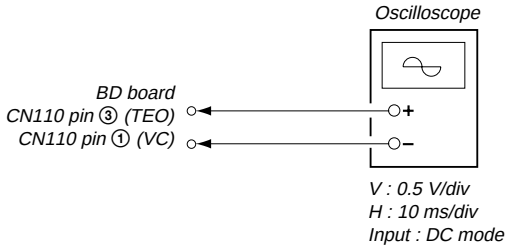
Iop = 82.5 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

10. 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.)
11. Rotate the AMS knob to display “Iop.Write” (S: 28).
12. Press the YES button. When the display becomes Ref=@@@.@ (@ is an arbitrary number), press the YES button to display “Measu=@@@.@” (@ is an arbitrary number).
13. The numbers which can be changed will blink. Input the Iop value noted down at step 9.
    To select the number : Rotate the AMS knob.
    To select the digit : Press the AMS knob
14. When the YES button is pressed, “Complete!” will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become “Iop Write”.

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. TRAVERSE ADJUSTMENT

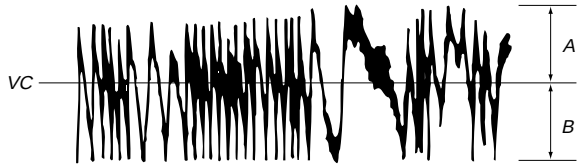
Connection :



Adjusting Procedure :

1. Connect an oscilloscope to CN110 pin ③ (TEO) and CN110 pin ① (VC) of the BD board.
2. Load a disc (any available on the market). (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 ADJUS” (S: 11).
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. 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)

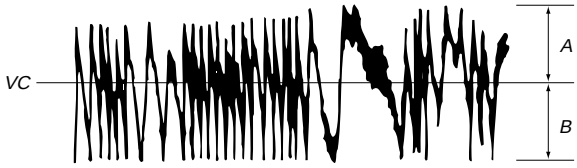
(Traverse Waveform)



Specification A = B

7. Press the YES button and save the result of adjustment to the non-volatile memory (“EFB = □ SAV” will be displayed for a moment. Then “EFB = □ MO-W” will be displayed).
8. 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.
   (Write power traverse adjustment)

(Traverse Waveform)

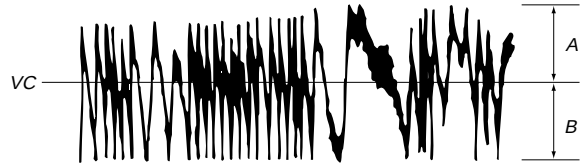


Specification A = B

9. Press the YES button, and save the adjustment results in the non-volatile memory. (“EFB = □ SAV” will be displayed for a moment.)
10. “EFB = □ MO-P”. will be displayed.
    The optical pick-up moves to the pit area automatically and servo is imposed.

11. Rotate the 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.

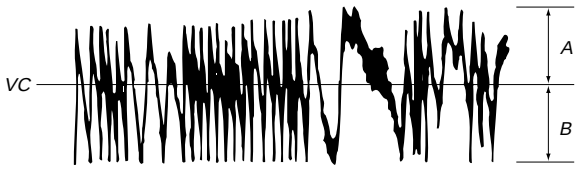
(Traverse Waveform)



Specification A = B

12. Press the YES button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAV" will be displayed for a moment.)
    Next "EF MO ADJUS" is displayed. The disc stops rotating automatically.
13. Press the ⏏EJECT button and remove the disc.
14. Load the check disc (MD) TDYS-1.
15. Roteto AMS knob and display "EF CD ADJUS" (S: 12).
16. Press the YES button and display "EFB = □□ CD". Servo is imposed automatically.
17. 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)

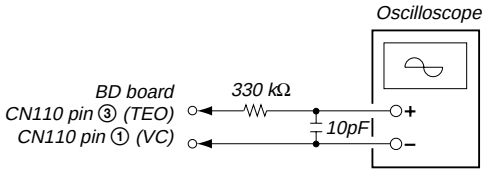


Specification A = B

18. Press the YES button, display "EFB = □□ SAV" for a moment and save the adjustment results in the non-volatile memory.
    Next "EF CD ADJUS" will be displayed.
19. Press the ⏏EJECT button and remove the check disc (MD) TDYS-1.

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

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



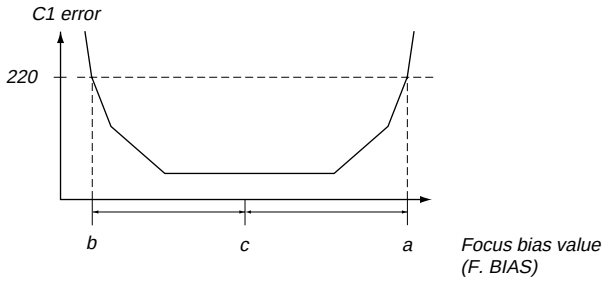
5-12. FOCUS BIAS ADJUSTMENT

Adjusting Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the AMS knob and display "CPLAY MODE" (S: 30).
3. Press the YES button and display "CPLAY MID".
4. Press the MENU/NO button when "C = □□□□ AD = □□" is displayed.
5. Rotate the AMS knob and display "FBIAS ADJUST" (S: 13).
6. 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.
7. 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).
8. Press the YES button and display " □□□□/□□ b = □□".
9. Rotate the AMS knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
10. Press the YES button and display " □□□□/□□ c = □□".
11. Check that the C1 error rate is below 50 and ADER is 00. Then press the YES button.
12. If the "(□□)" in "□□ - □□ - □□ (□□)" is above 20, press the YES button.
    If below 20, press the MENU/NO button and repeat the adjustment from step 2.
13. Press the ⏏EJECT 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 vale.



5-13. ERROR RATE CHECK

5-13-1. CD Error Rate Check

Checking Procedure :

1. Load a check disc (MD) TDYS-1.
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button twice and display “CPLAY MID”.
4. The display changes to “C = □□□□ AD = □□”.
5. Check that the C1 error rate is below 20.
6. Press the MENU/NO button, stop playback, press the ⏏EJECT button, and remove the test disc.

5-13-2. MO Error Rate Check

Checking Procedure :

1. Load a test disc (MDW-74/AU-1).
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button and display “CPLAY MID”.
4. The display changes to “C1 = □□□□ AD = □□”.
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the MENU/NO button, stop playback, press the ⏏EJECT button, and remove the test disc.

5-14. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load a test disc (MDW-74/AU-1).
2. Rotate the AMS knob and display “CPLAY MODE” (S: 30).
3. Press the YES button twice and display “CPLAY MID”.
4. Press the MENU/NO button when “C = □□□□ AD = □□” is displayed.
5. Rotate the AMS knob and display “FBIAS CHECK” (S: 5).
6. 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 50 and ADER is below 2.
7. Press the YES button and display “ □□□□/□□ b = □□”.
   Check that the C1 error is below 220 and ADER is below 2.
8. Press the YES button and display “ □□□□/□□ a = □□”.
   Check that the C1 error is below 220 and ADER is below 2
9. Press the MENU/NO button, next press the ⏏EJECT 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.

5-15. AUTO GAIN CONTROL OUTPUT LEVEL ADJUSTMENT

Be sure to perform this adjustment when the pickup is replaced. If the adjustment results becomes “Adjust NG!”, the pickup may be faulty or the servo system circuits may be abnormal.

5-15-1. 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)” (S: 26).
3. When the YES button is pressed, the adjustment will be performed automatically.
   “Complete!!” will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to “AG Set (CD)”.
4. Press the ⏏EJECT button to remove the disc.

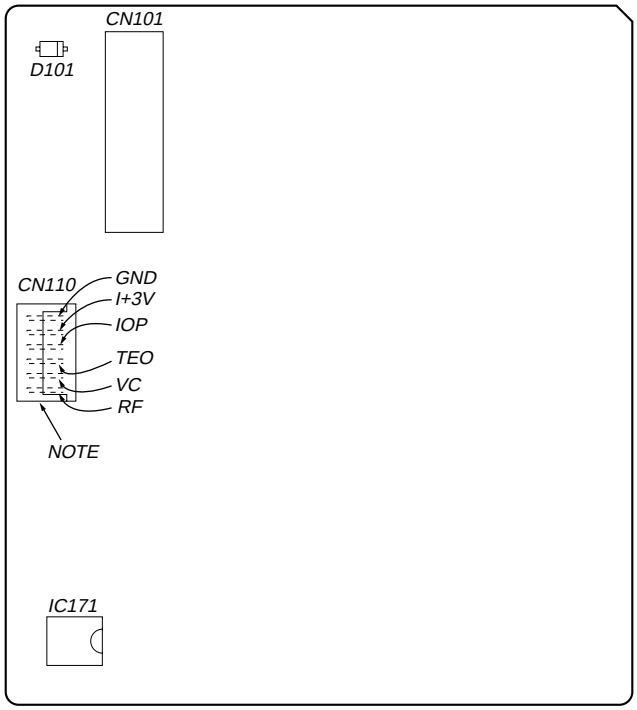
5-15-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :

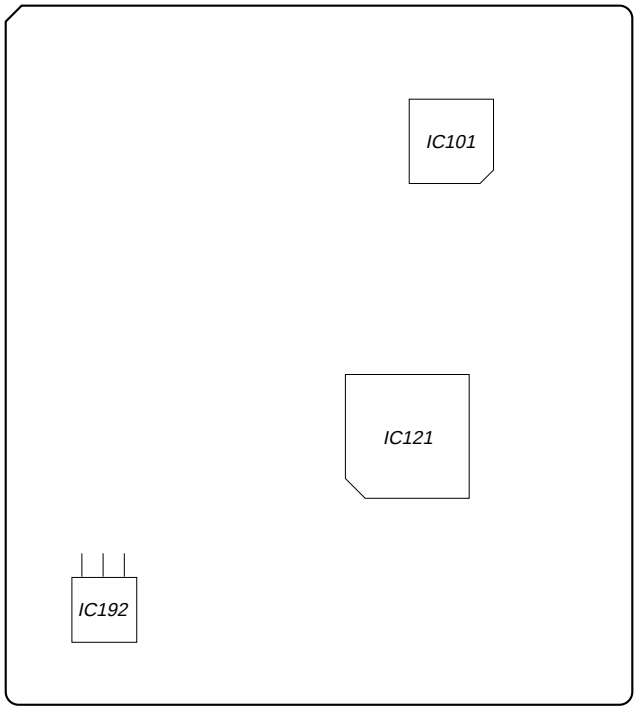
1. Insert the reference disc (MDW-74/AU-1) for recording.
2. Rotate the AMS knob to display “AG Set (MO)” (S: 25).
3. When the YES button is pressed, the adjustment will be performed automatically.
   “Complete!!” will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to “AG Set (MO)”.
4. Press the ⏏EJECT button to remove the disc.

5-15. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



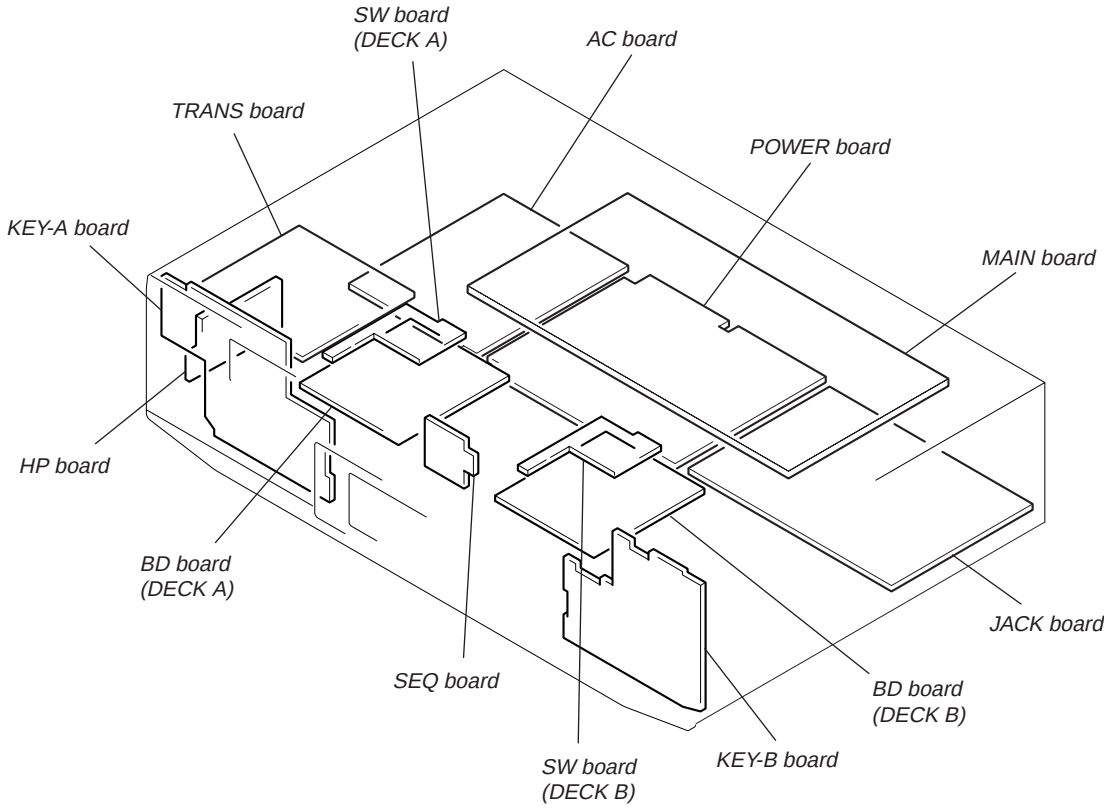
[BD BOARD] (SIDE B)



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

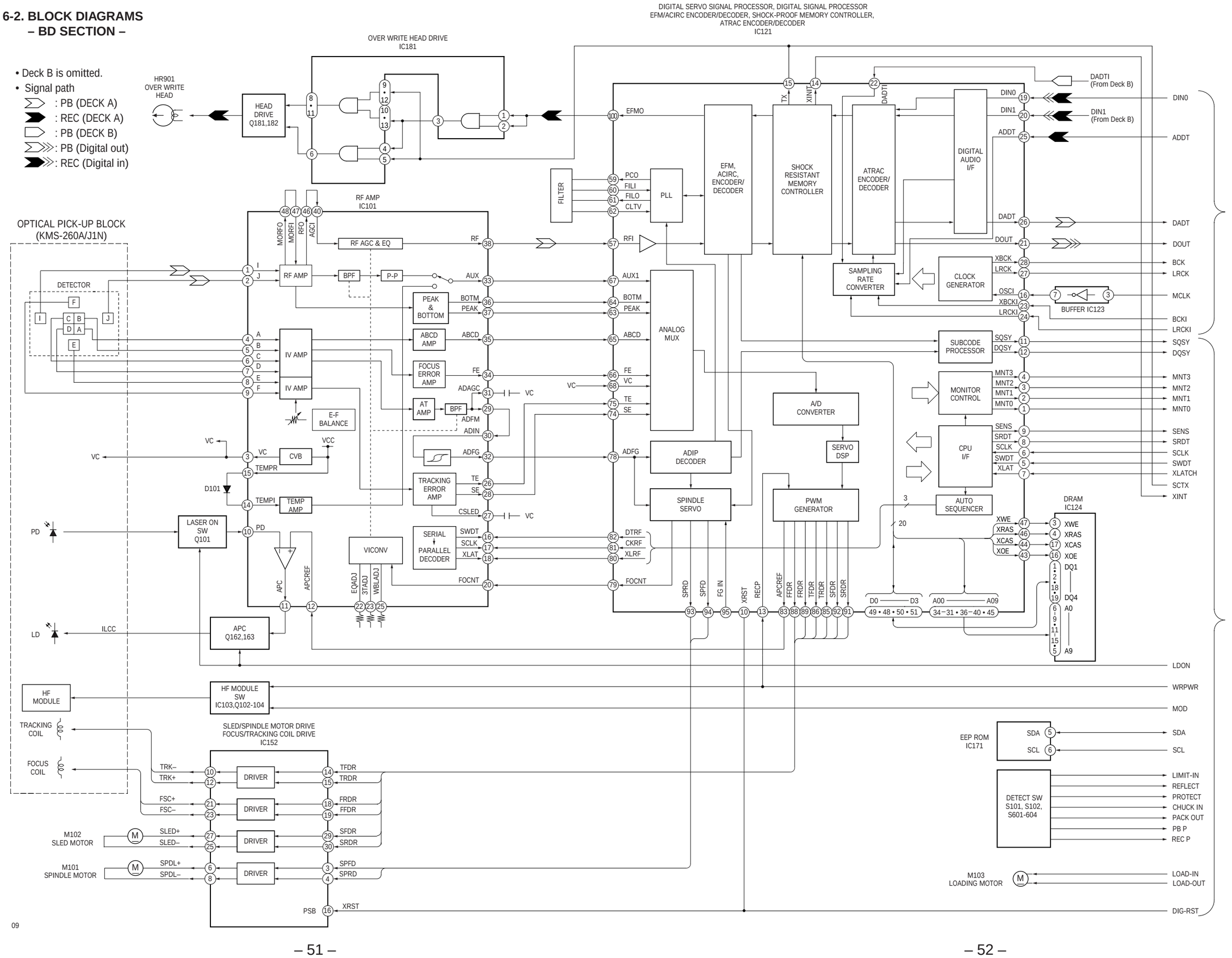
SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION



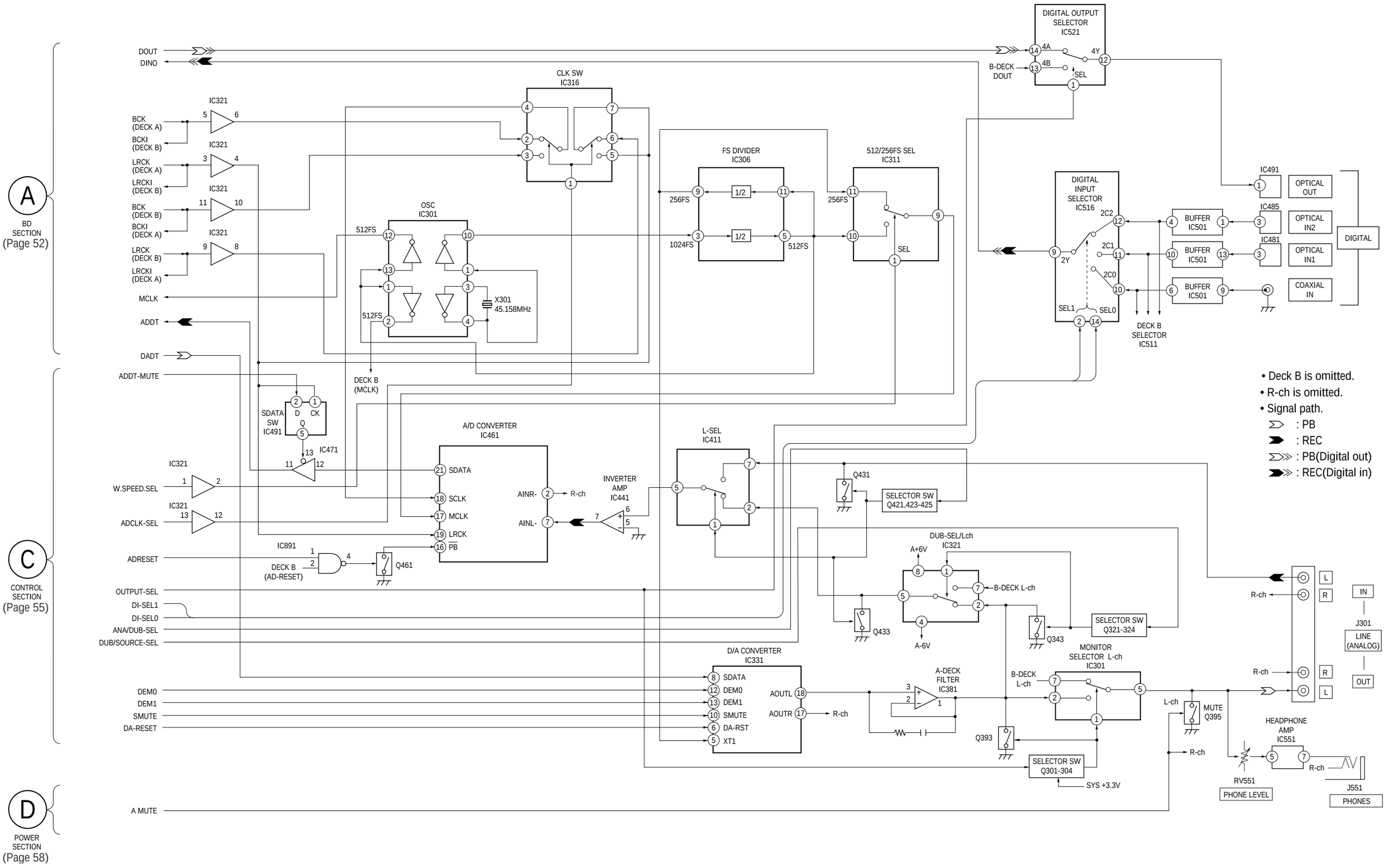
6-2. BLOCK DIAGRAMS – BD SECTION –

- Deck B is omitted.
- Signal path
  - : PB (DECK A)
  - : REC (DECK A)
  - : PB (DECK B)
  - : PB (Digital out)
  - : REC (Digital in)

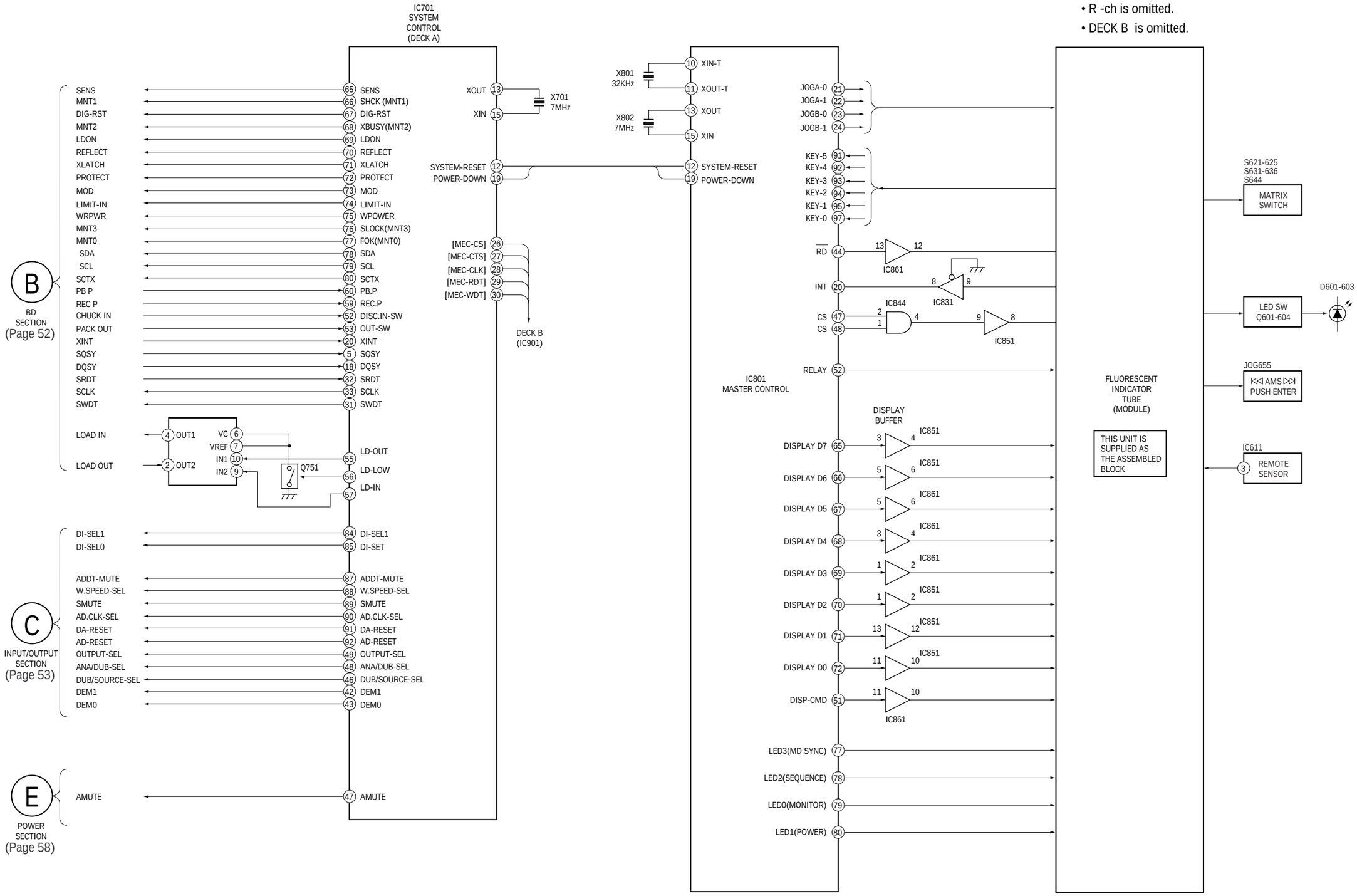


09

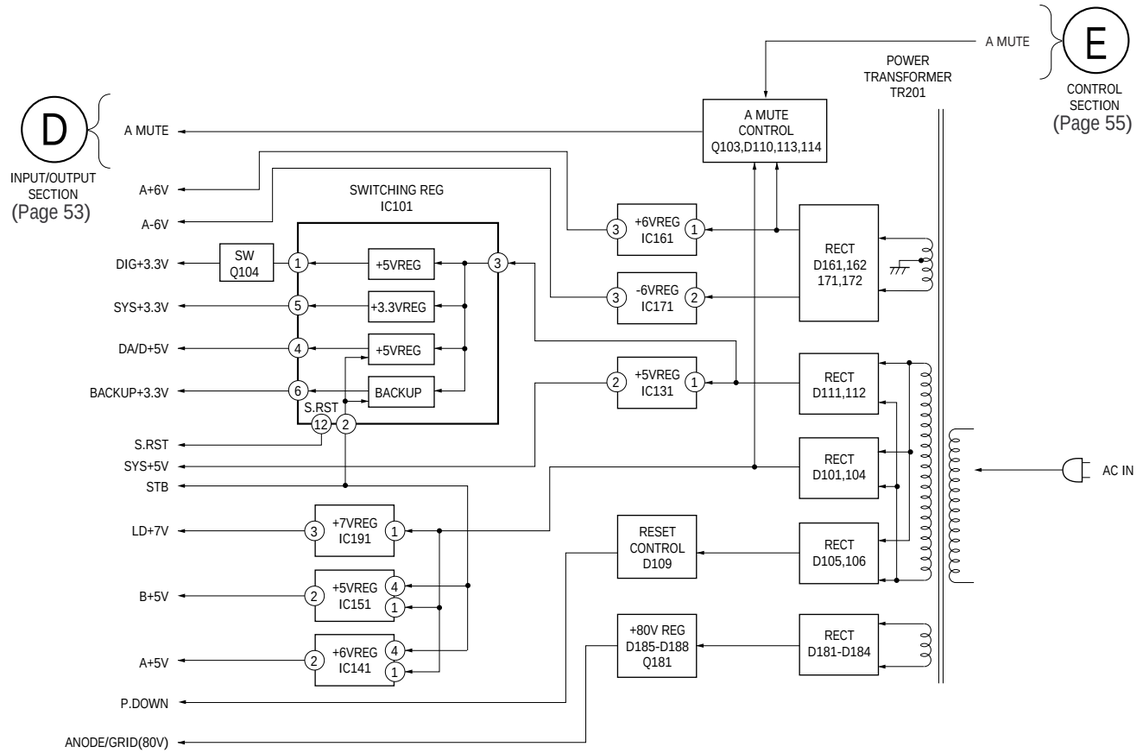
– INPUT/OUTPUT SECTION –



– CONTROL SECTION –



– POWER SECTION –



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

For schematic diagrams.

Note:

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

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

- B+ : B+ Line.
- B– : B– Line.
- : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions. (Play the test disc (TDYS-1)
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  - : PB (DECK A)
  - : REC (DECK A)
  - : PB (DECK B)
  - : REC (DECK B)
  - : PB (Digital out)
  - : REC (Digital in)

For printed wiring boards.

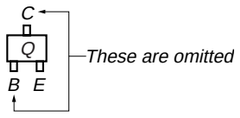
Note:

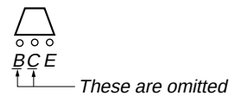
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- △ : internal component.
- : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

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

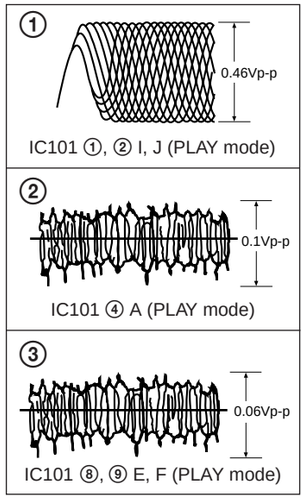
- **Indication of transistor**



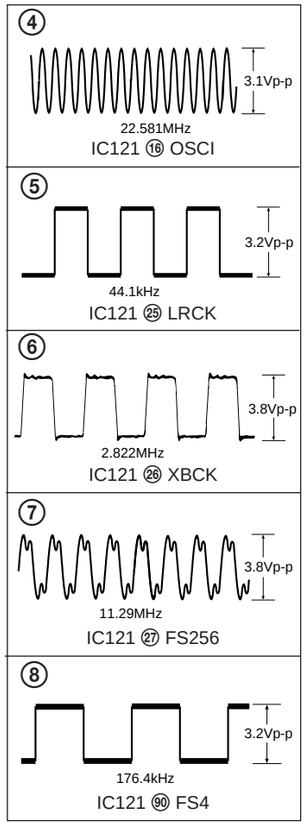


WAVEFORMS

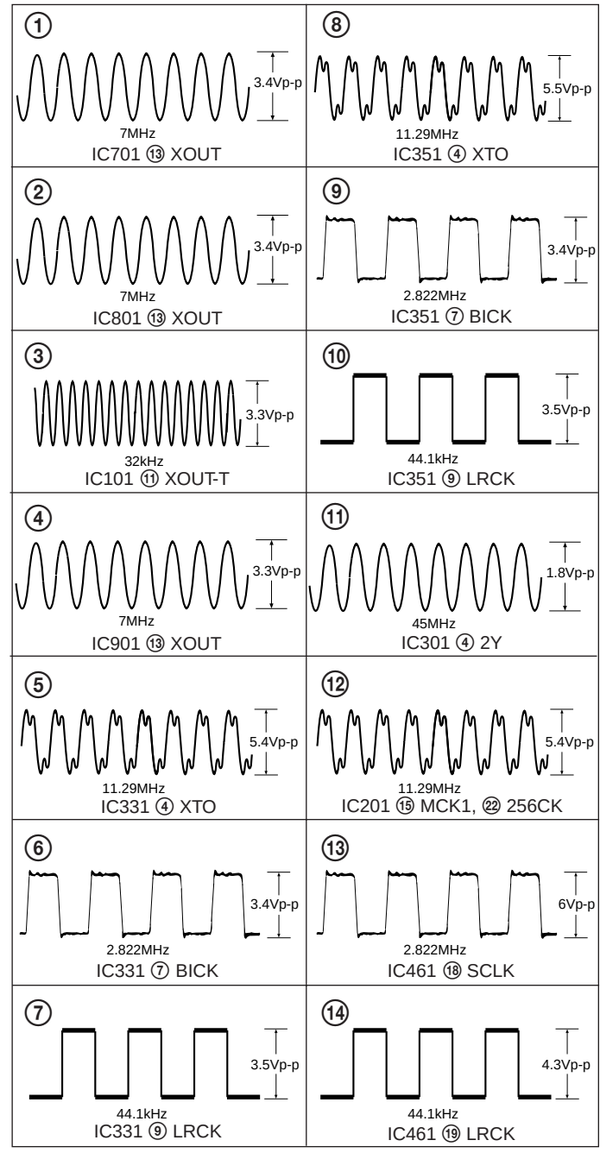
• BD BOARD (1/2)



• BD BOARD (2/2)

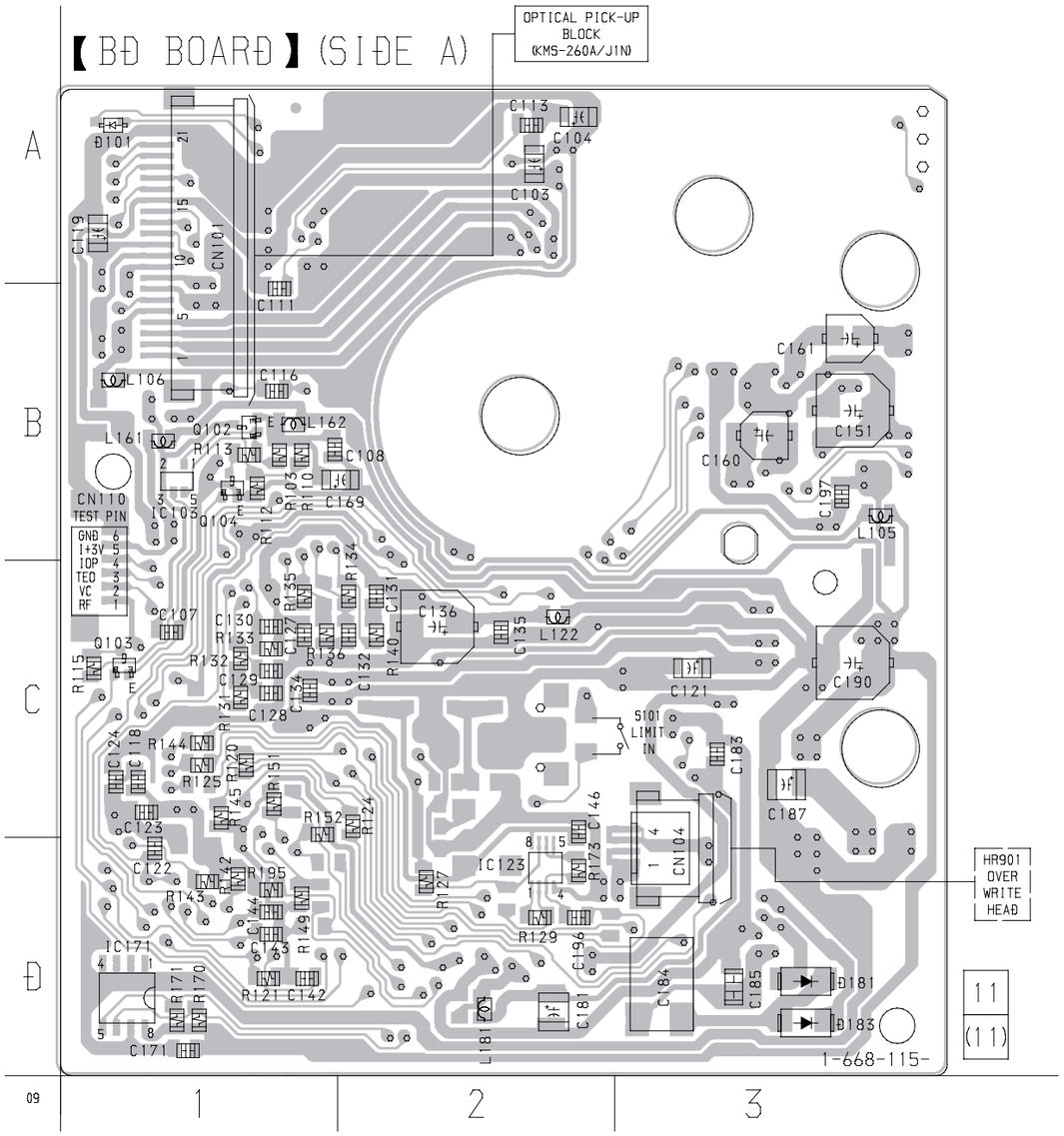


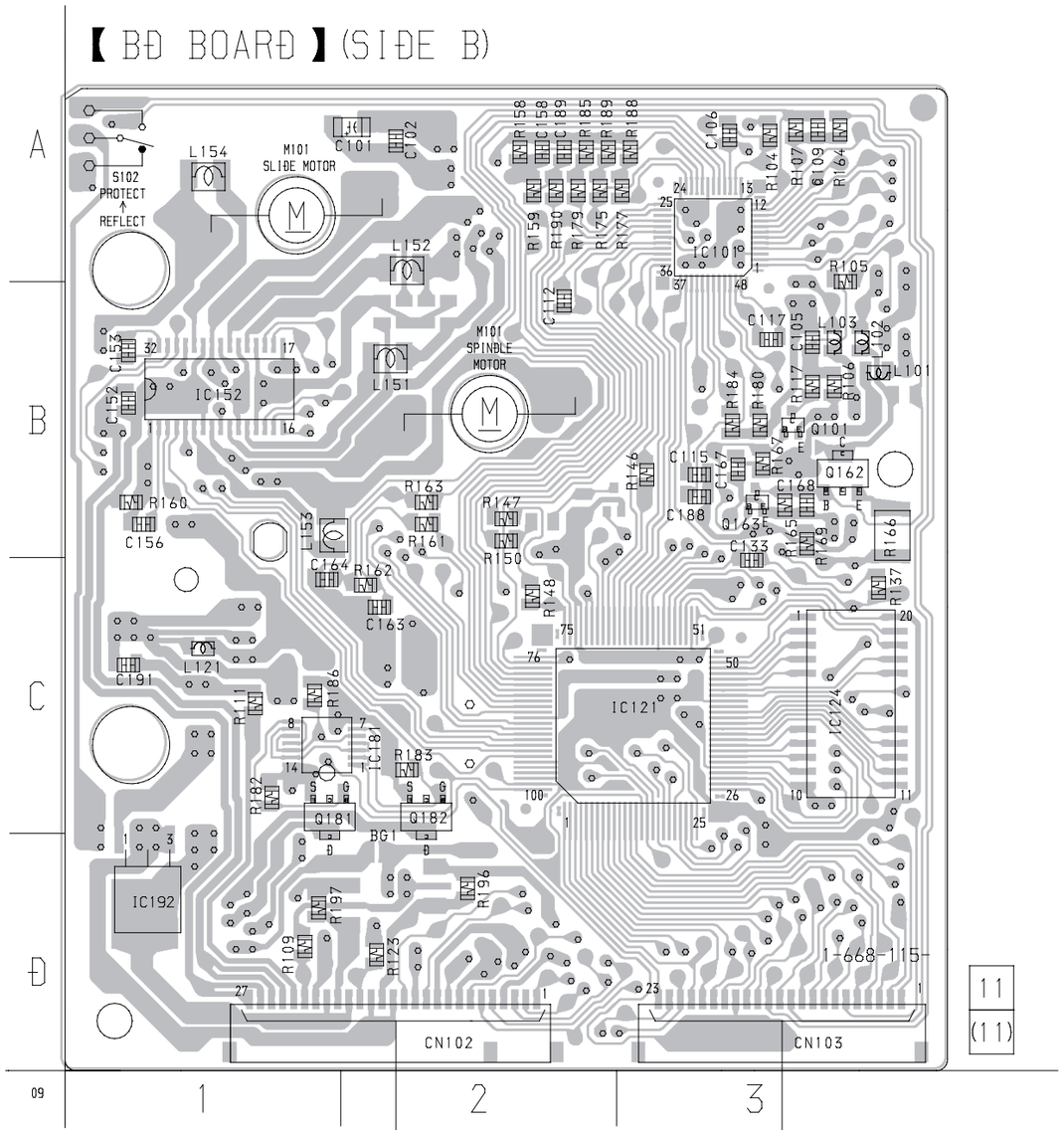
• MAIN BOARD



6-3. PRINTED WIRING BOARD – BD SECTION –

• See page 50 for Circuit Boards Location.





(Page73, 74) A

(Page73, 74) B

• **Semiconductor Location**

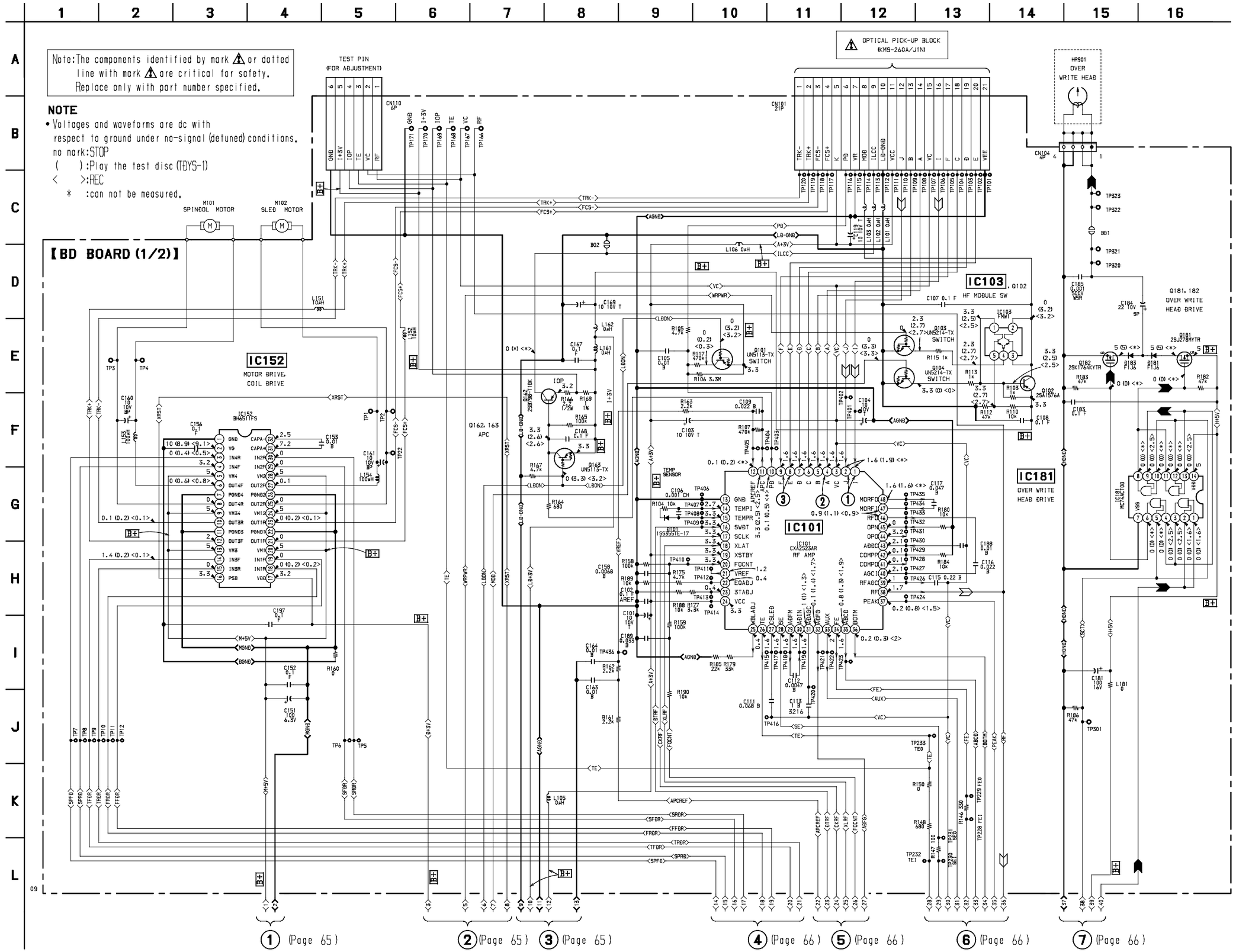
Ref. No.	Location
D101	A-1
D181	D-3
D183	D-3
IC103	B-1
IC171	D-1
Q102	B-1
Q103	B-1
Q104	B-1

• **Semiconductor Location**

Ref. No.	Location
IC101	A-3
IC121	C-3
IC123	D-2
IC124	C-3
IC152	B-1
IC181	C-1
IC192	D-1
Q101	B-3
Q162	B-3
Q163	B-3
Q181	C-1
Q182	C-2

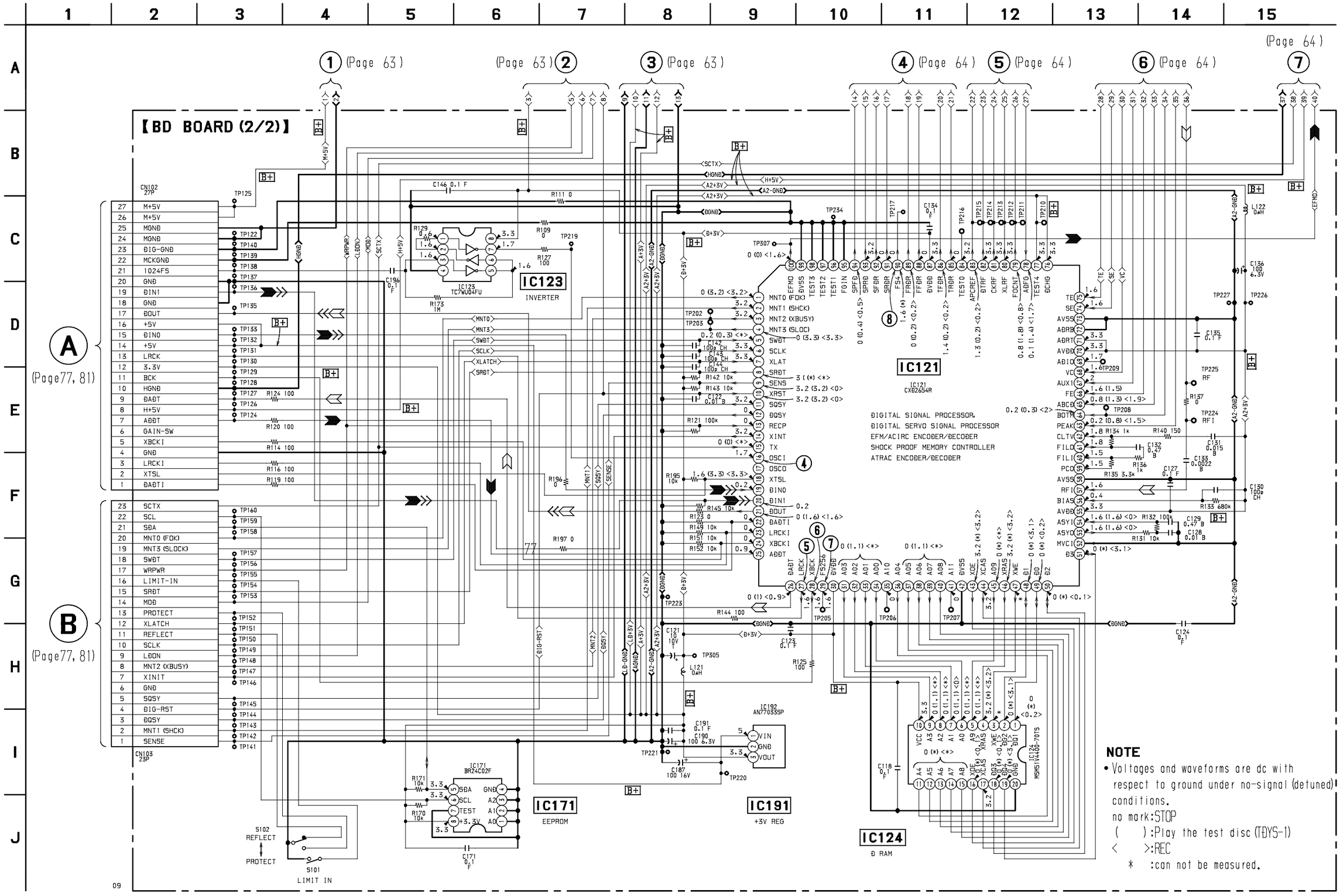
6-4. SCHEMATIC DIAGRAM – BD (1/2) SECTION –

- See page 60 for Waveforms.
- See page 101 for IC Block Diagrams.
- See page 105 for IC Pin Functions.



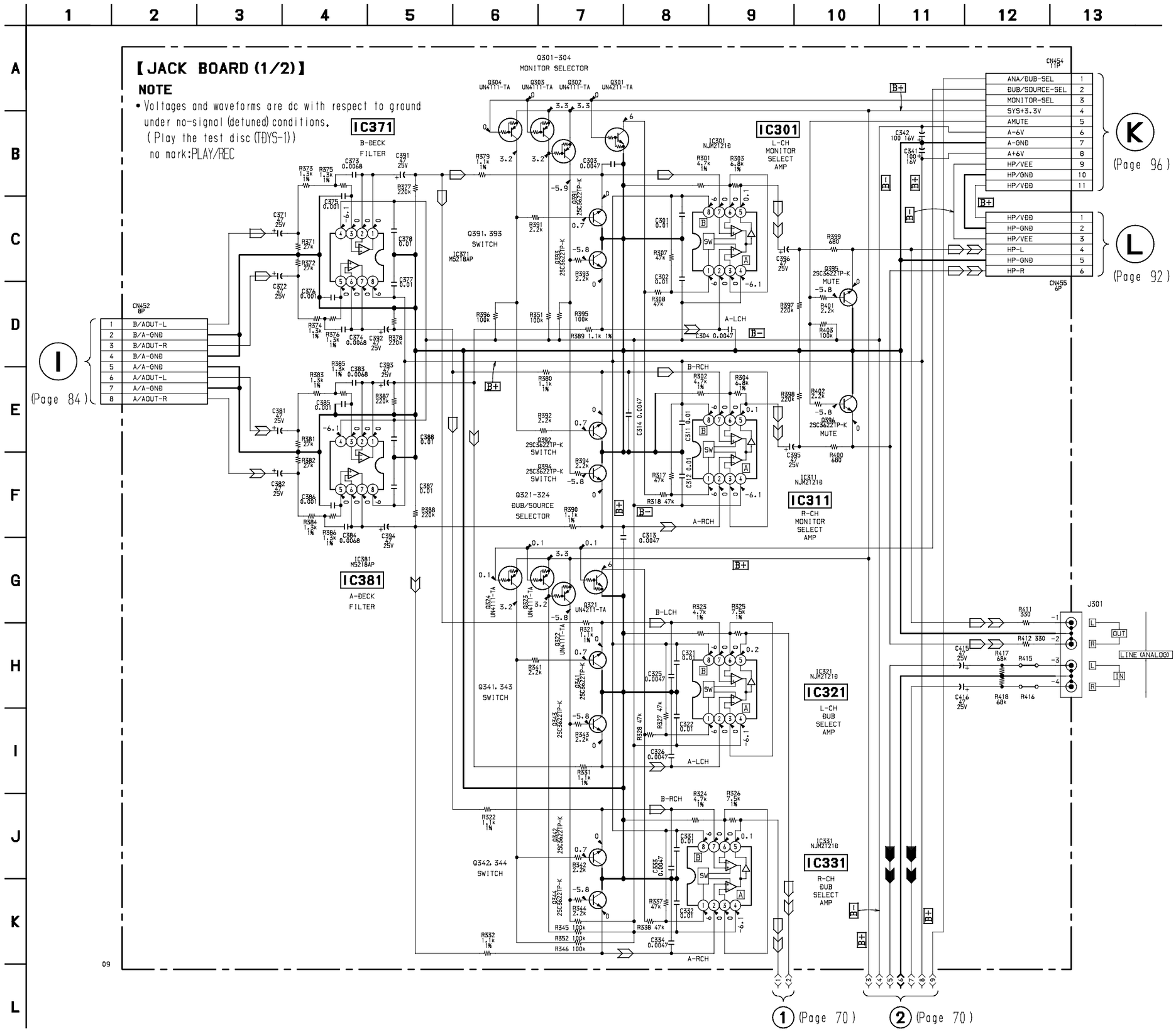
6-5. SCHEMATIC DIAGRAM – BD (2/2) SECTION –

- See page 60 for Waveforms.
- See page 61 Printed Wiring Board.
- See page 102 for IC Block Diagrams.
- See page 106 for IC Pin Functions.



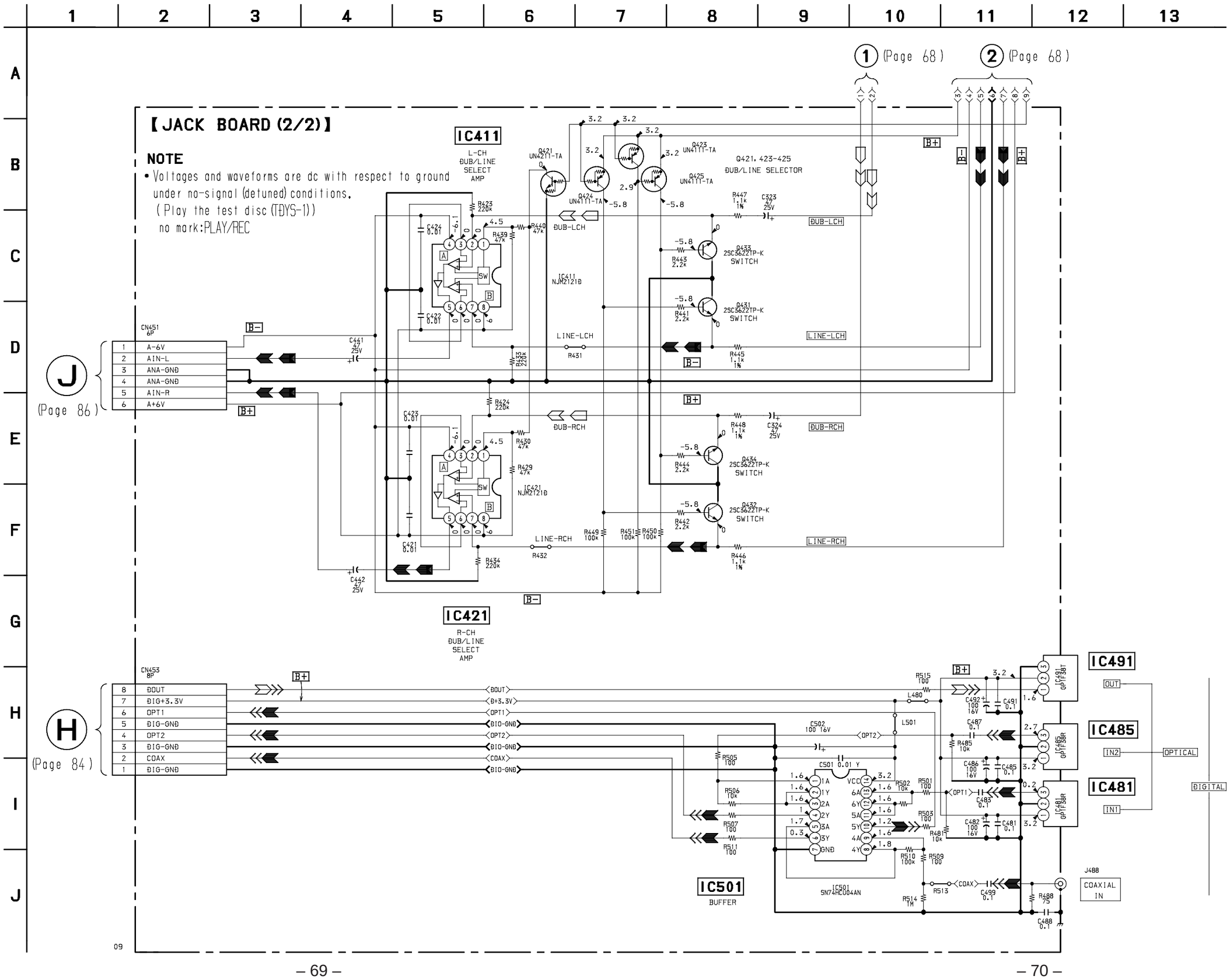
6-6. SCHEMATIC DIAGRAM – JACK (1/2) SECTION –

• See page 71 Printed Wiring Board.



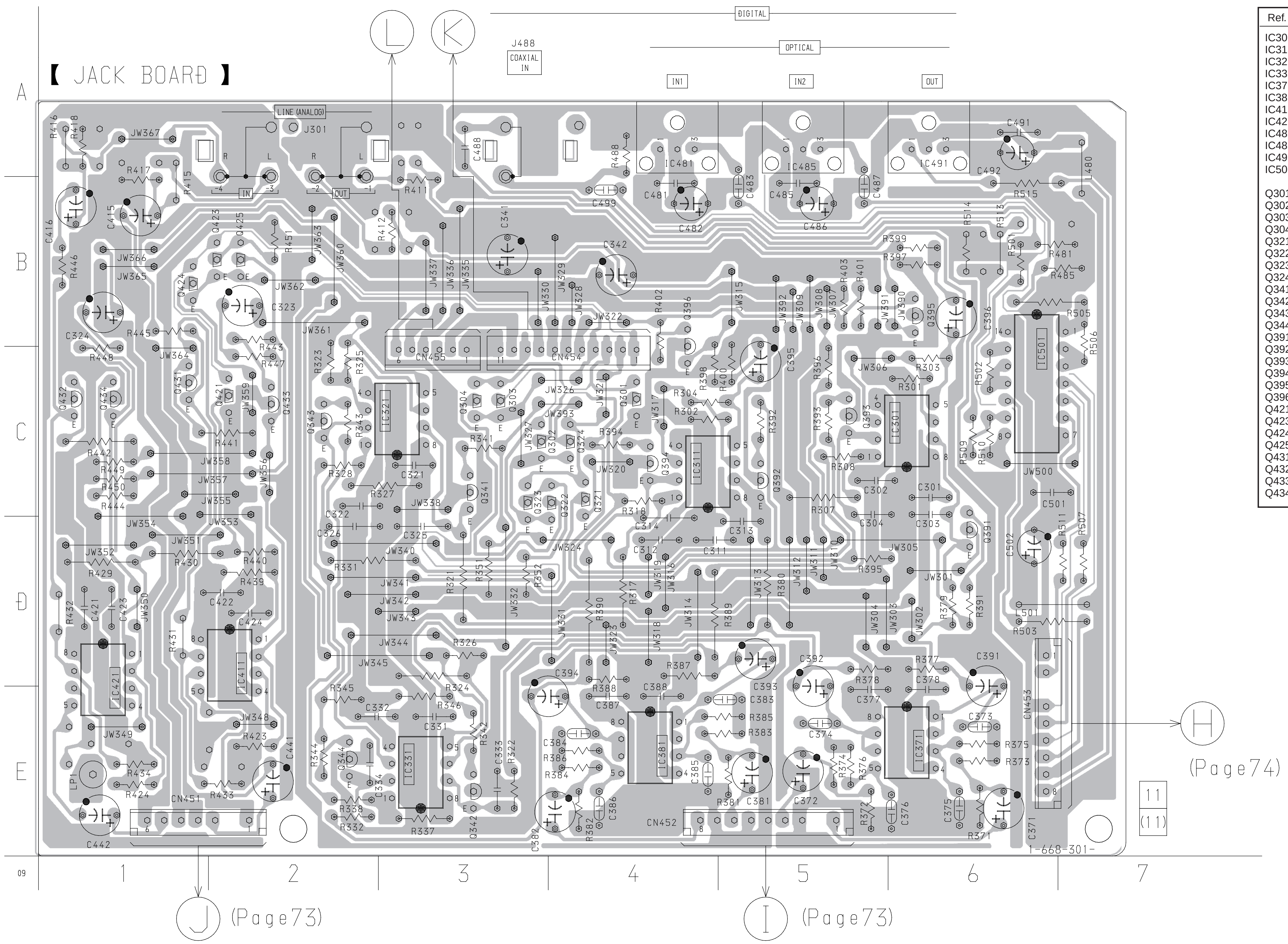
6-7. SCHEMATIC DIAGRAM – JACK (2/2) SECTION –

• See page 103 for IC Block Diagrams.



6-8. PRINTED WIRING BOARD – JACK SECTION –

• See page 50 for Circuit Boards Location.

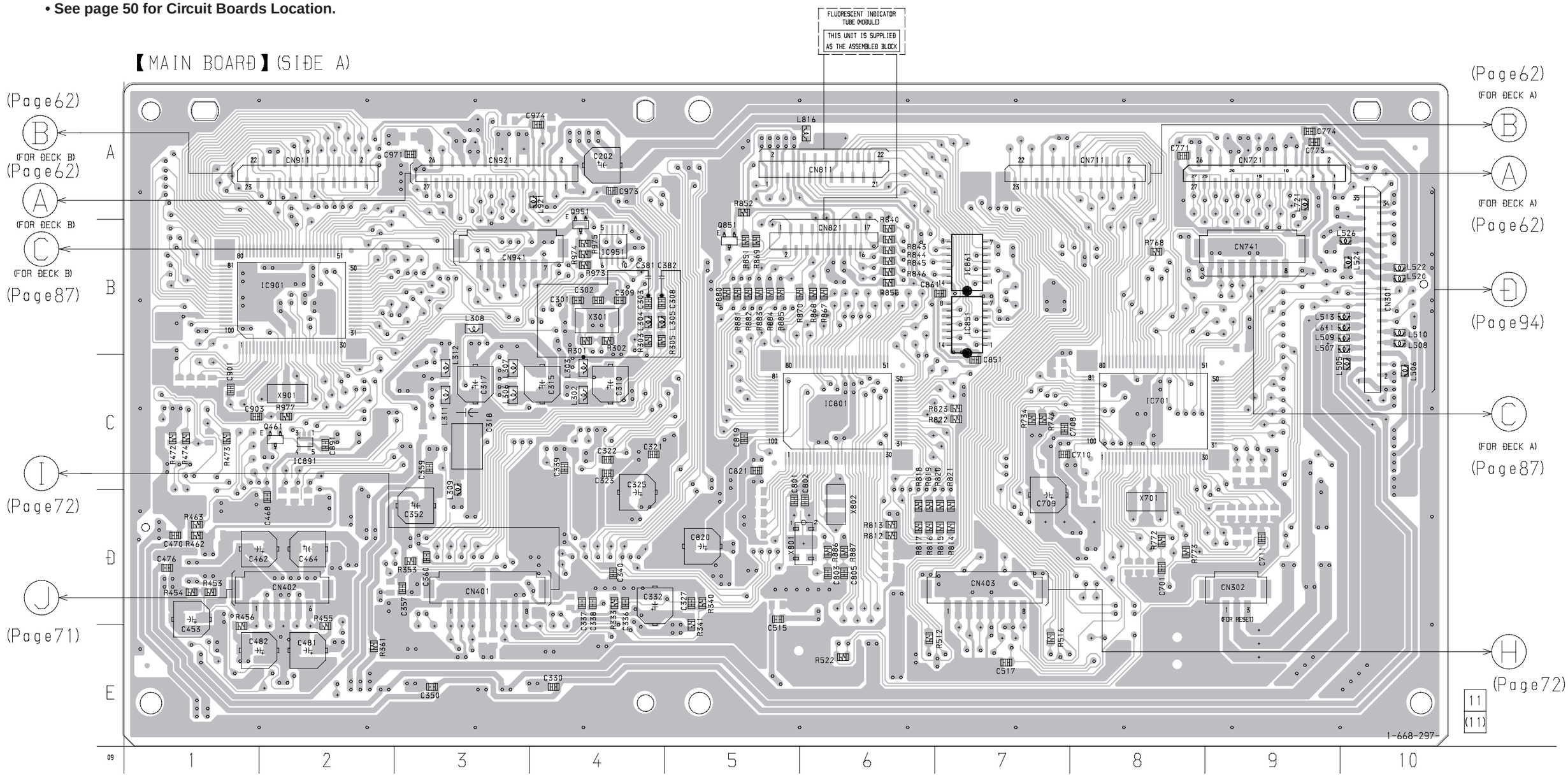


• **Semiconductor Location**

Ref. No.	Location
IC301	C-6
IC311	C-4
IC321	C-3
IC331	E-3
IC371	E-6
IC381	E-4
IC411	D-2
IC421	D-1
IC481	A-4
IC485	A-5
IC491	A-6
IC501	C-6
Q301	C-4
Q302	C-3
Q303	C-3
Q304	C-3
Q321	C-4
Q322	C-4
Q323	C-3
Q324	C-4
Q341	C-3
Q342	E-3
Q343	C-2
Q344	E-2
Q391	D-6
Q392	C-5
Q393	C-5
Q394	C-4
Q395	B-6
Q396	B-4
Q421	C-2
Q423	B-2
Q424	B-1
Q425	B-2
Q431	C-1
Q432	C-1
Q433	C-2
Q434	C-1

6-9. PRINTED WIRING BOARD – MAIN SECTION –

• See page 50 for Circuit Boards Location.

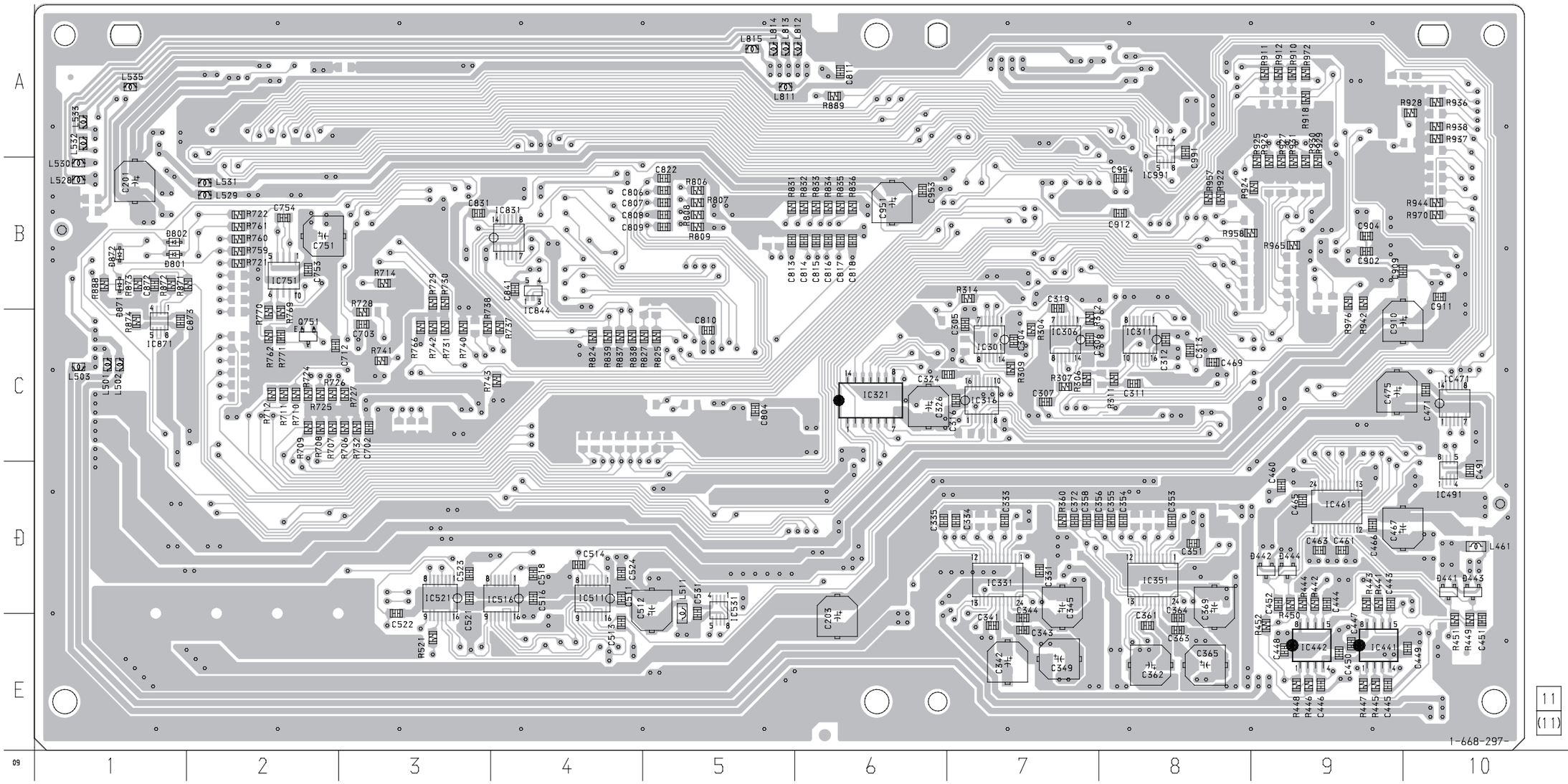


• **Semiconductor Location**

Ref. No.	Location
IC701	C-8
IC801	C-6
IC851	B-7
IC861	B-7
IC891	C-2
IC901	B-2
IC951	B-4
Q461	C-2
Q851	B-5
Q951	B-4

PRINTED WIRING BOARD – MAIN SECTION –
• See page 50 for Circuit Boards Location.

【MAIN BOARD】(SIDE B)

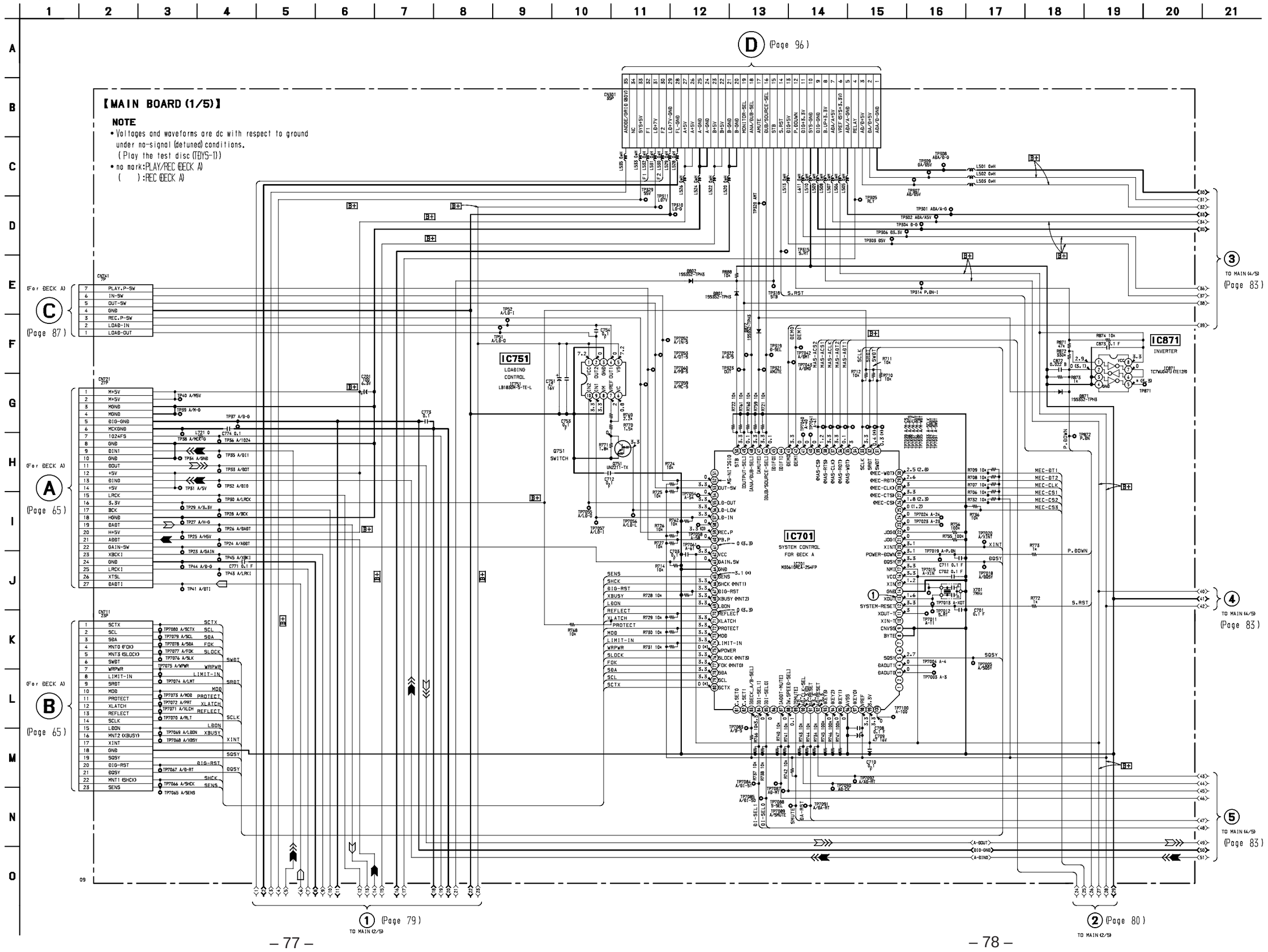


• **Semiconductor Location**

Ref. No.	Location
D441	D-10
D442	D-9
D443	D-10
D444	D-9
D801	B-1
D802	B-1
D871	B-1
D872	B-1
IC301	C-7
IC306	C-7
IC311	C-8
IC316	C-7
IC321	C-6
IC331	D-7
IC351	D-8
IC441	E-9
IC442	E-9
IC461	D-9
IC471	C-10
IC491	D-10
IC511	D-4
IC516	D-4
IC521	D-3
IC531	D-5
IC751	B-2
IC831	B-4
IC844	B-4
IC871	C-1
IC991	A-8
Q751	C-2

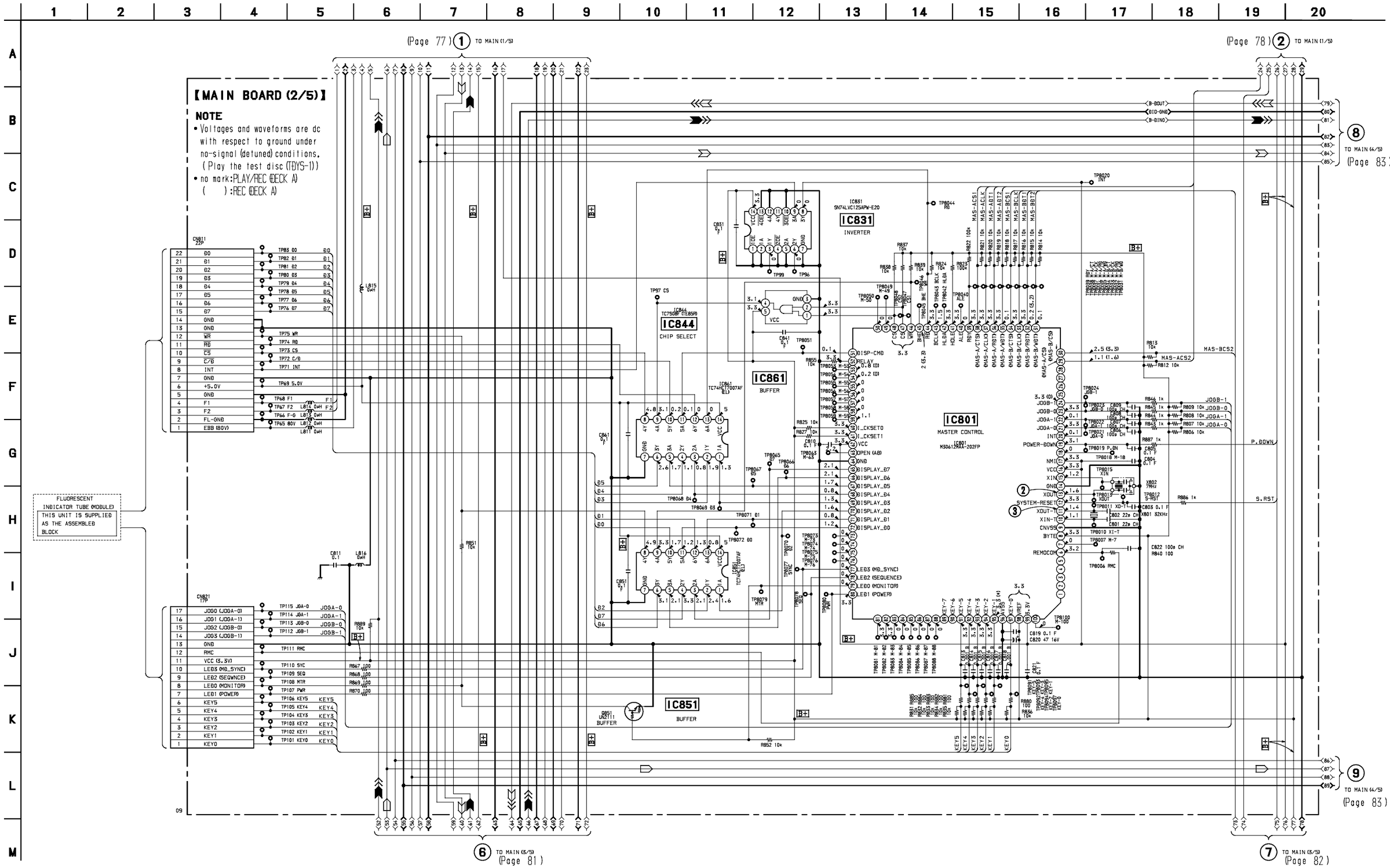
6-10. SCHEMATIC DIAGRAM – MAIN (1/5) SECTION –

- See page 60 for Waveforms.
- See page 73 Printed Wiring Board.
- See page 104 for IC Block Diagrams.
- See page 109 for IC Pin Functions.



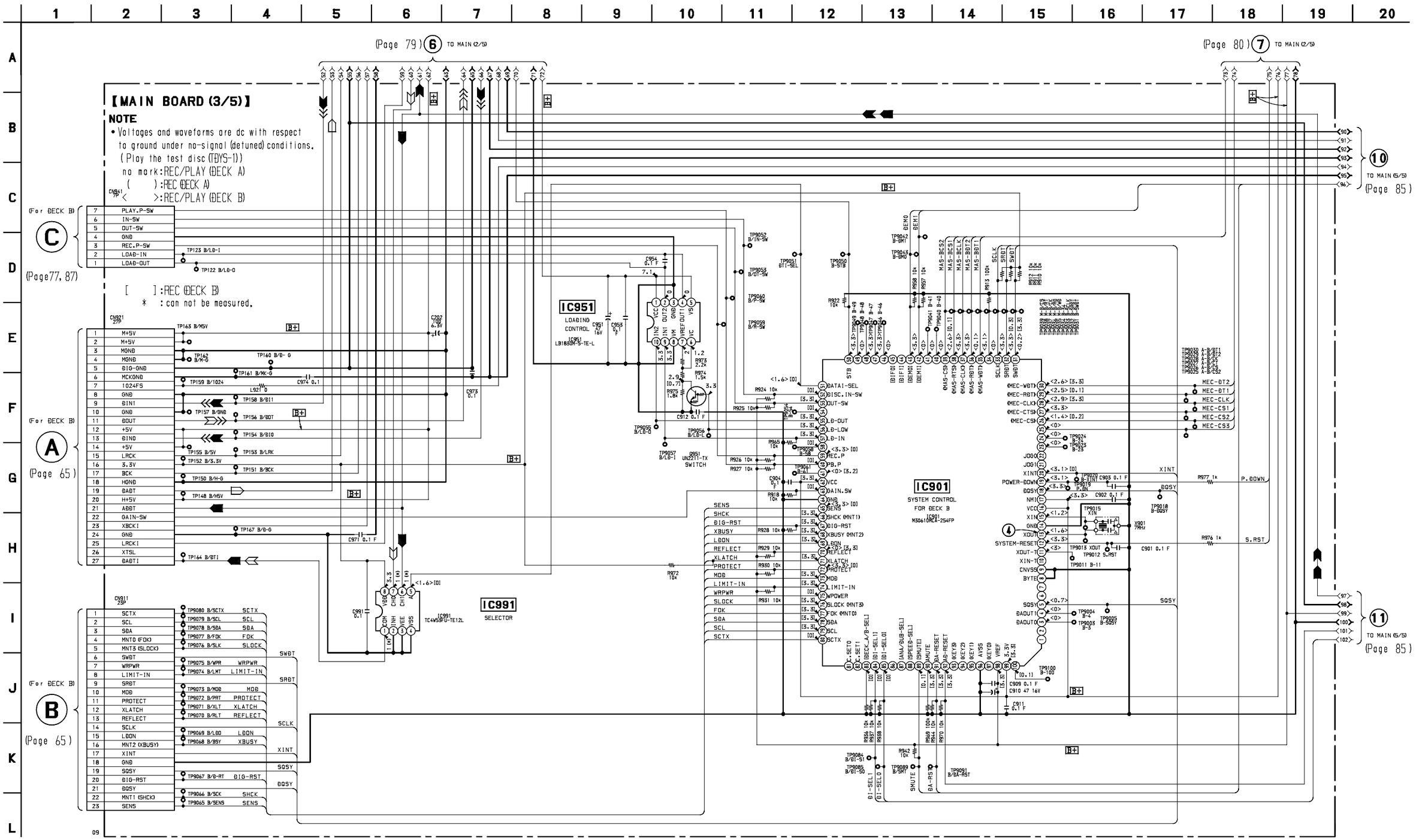
6-11. SCHEMATIC DIAGRAM – MAIN (2/5) SECTION –

- See page 60 for Waveforms.
- See page 73 Printed Wiring Board.
- See page 103 for IC Block Diagrams.
- See page 111 for IC Pin Functions.



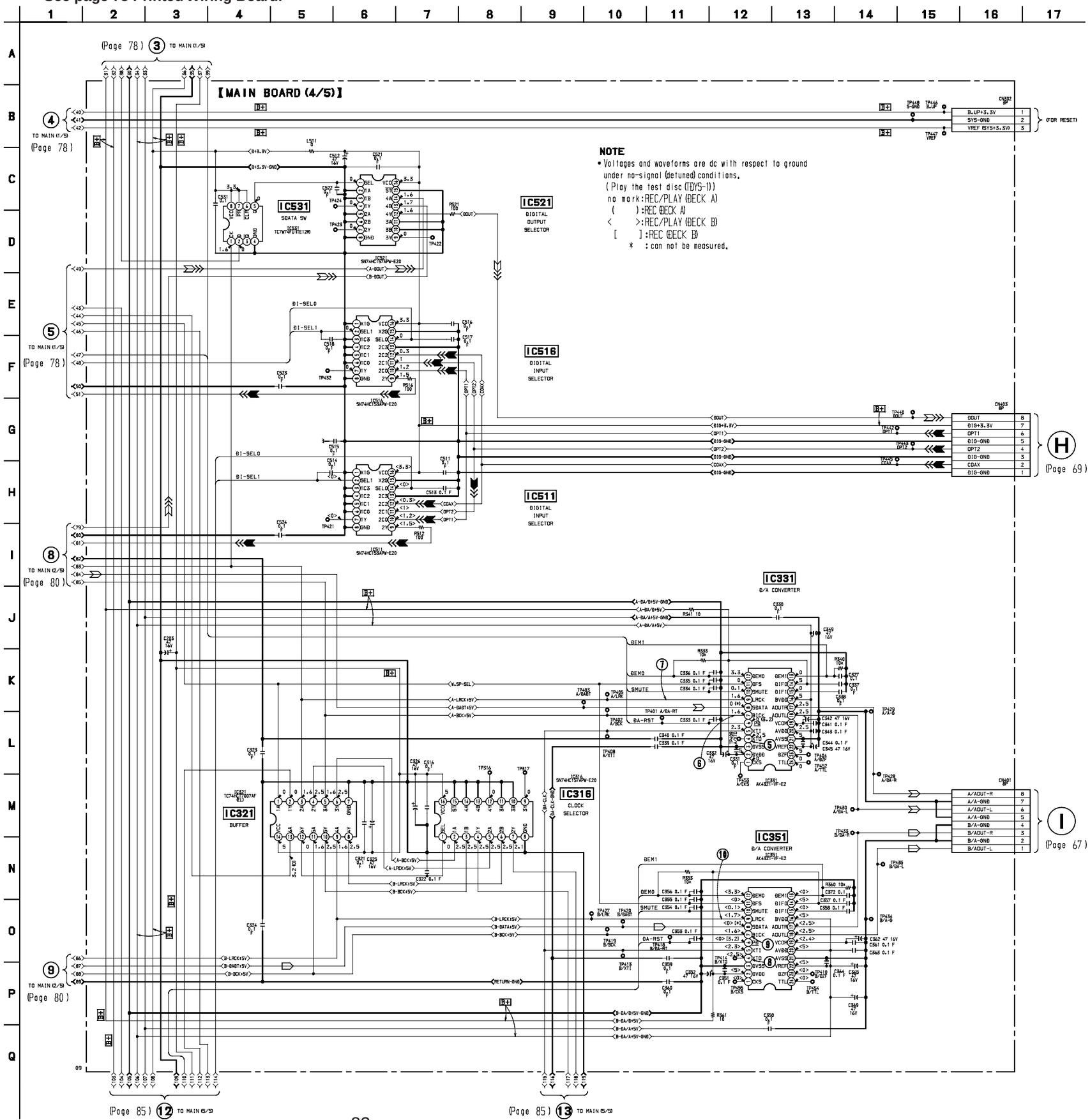
6-12. SCHEMATIC DIAGRAM – MAIN (3/5) SECTION –

- See page 60 for Waveforms.
- See page 75 Printed Wiring Board.
- See page 104 for IC Block Diagrams.
- See page 113 for IC Pin Functions.



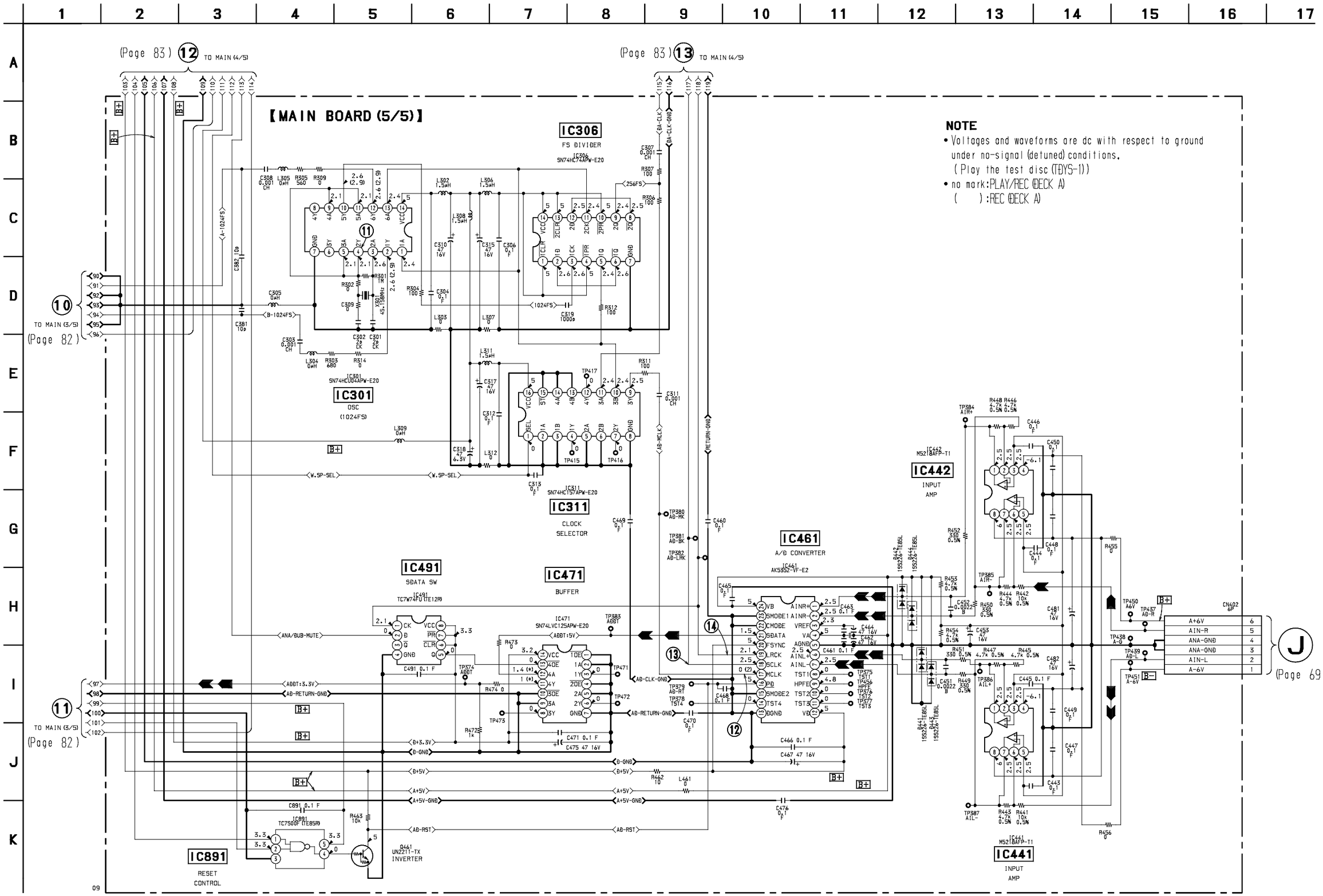
6-13. SCHEMATIC DIAGRAM – MAIN (4/5) SECTION –

• See page 60 for Waveforms.
• See page 103 for IC Block Diagrams.
• See page 75 Printed Wiring Board.

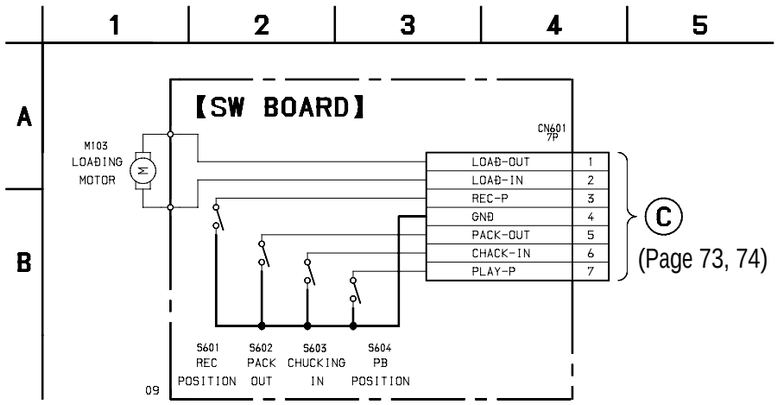


6-14. SCHEMATIC DIAGRAM – MAIN (5/5) SECTION –

- See page 60 for Waveforms.
- See page 75 Printed Wiring Board.
- See page 103 for IC Block Diagrams.

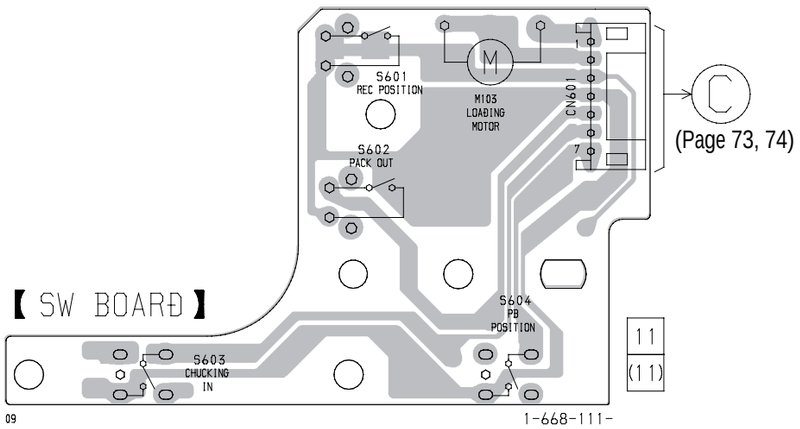


6-15. SCHEMATIC DIAGRAM – BD SWITCH SECTION –



6-16. PRINTED WIRING BOARD – BD SWITCH SECTION –

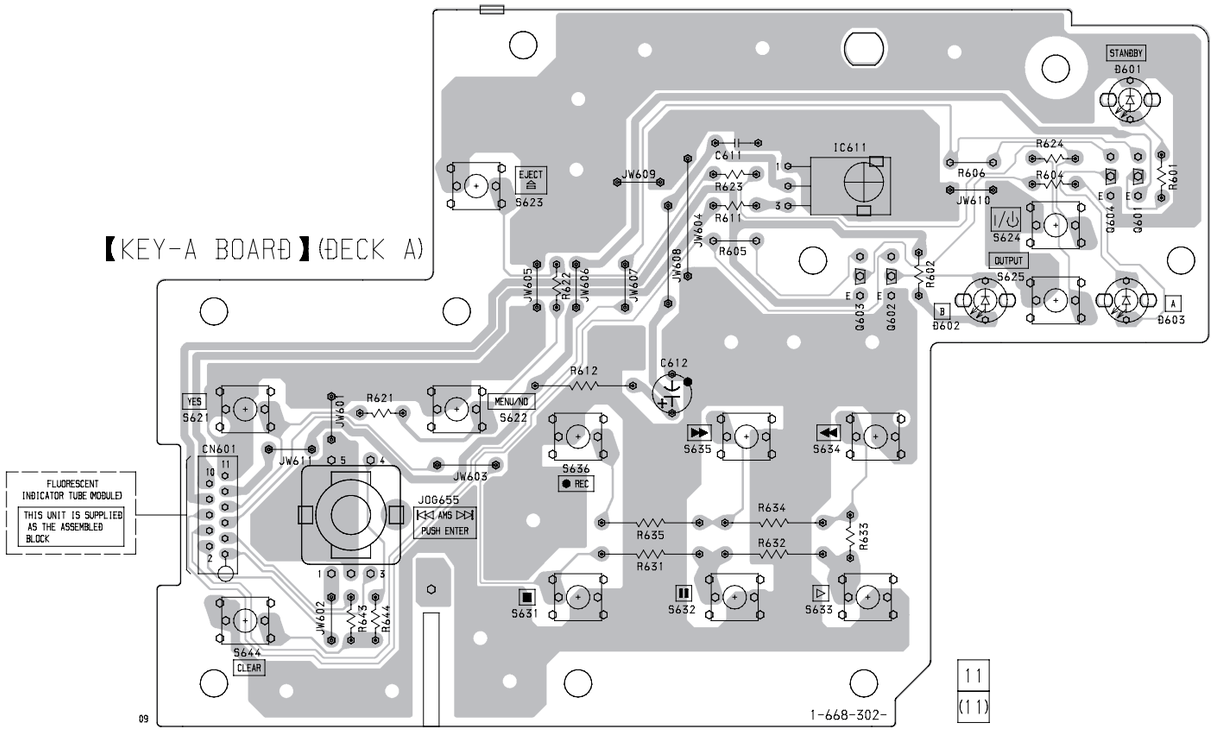
• See page 50 for Circuit Boards Location.



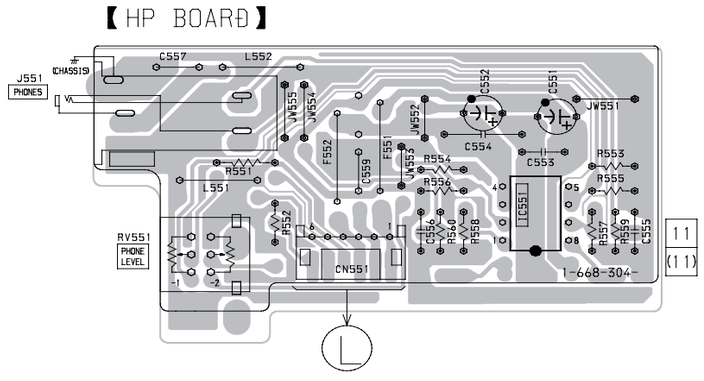
6-17. PRINTED WIRING BOARD – PANEL SECTION –

• See page 50 for Circuit Boards Location.

【KEY-A BOARD】(DECK A)

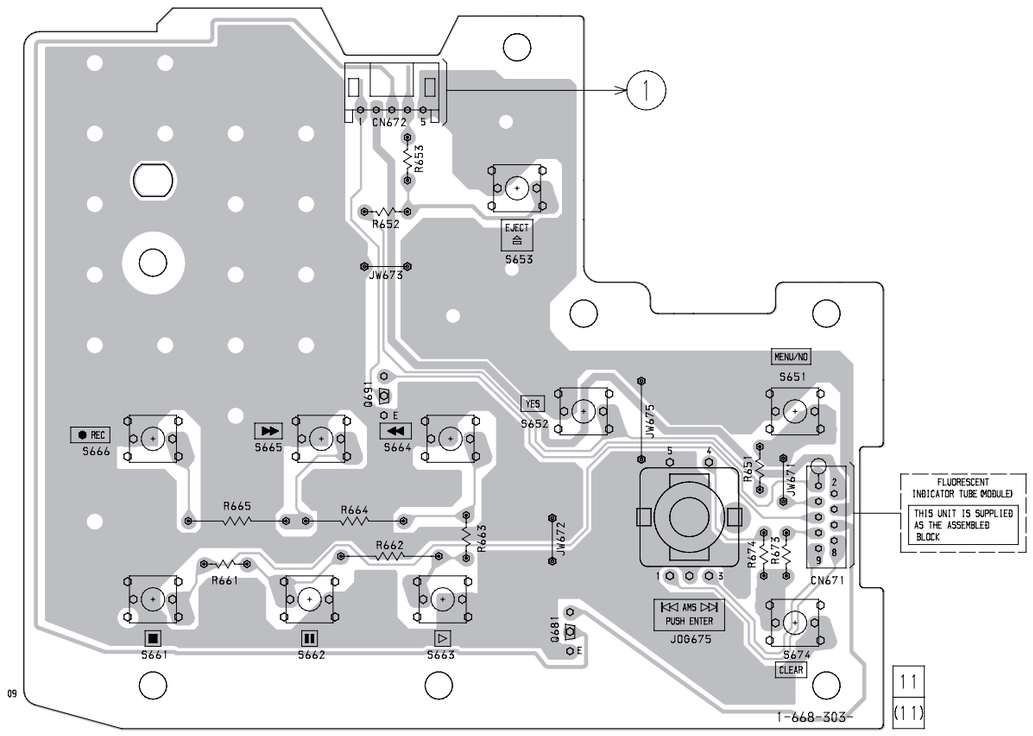


【HP BOARD】

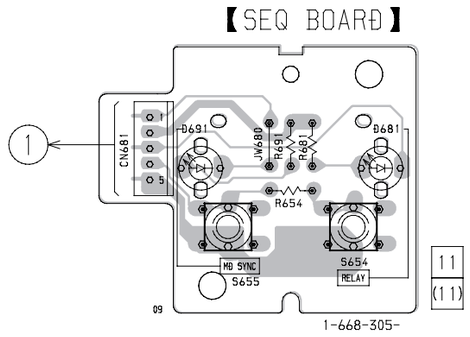


(Page71)

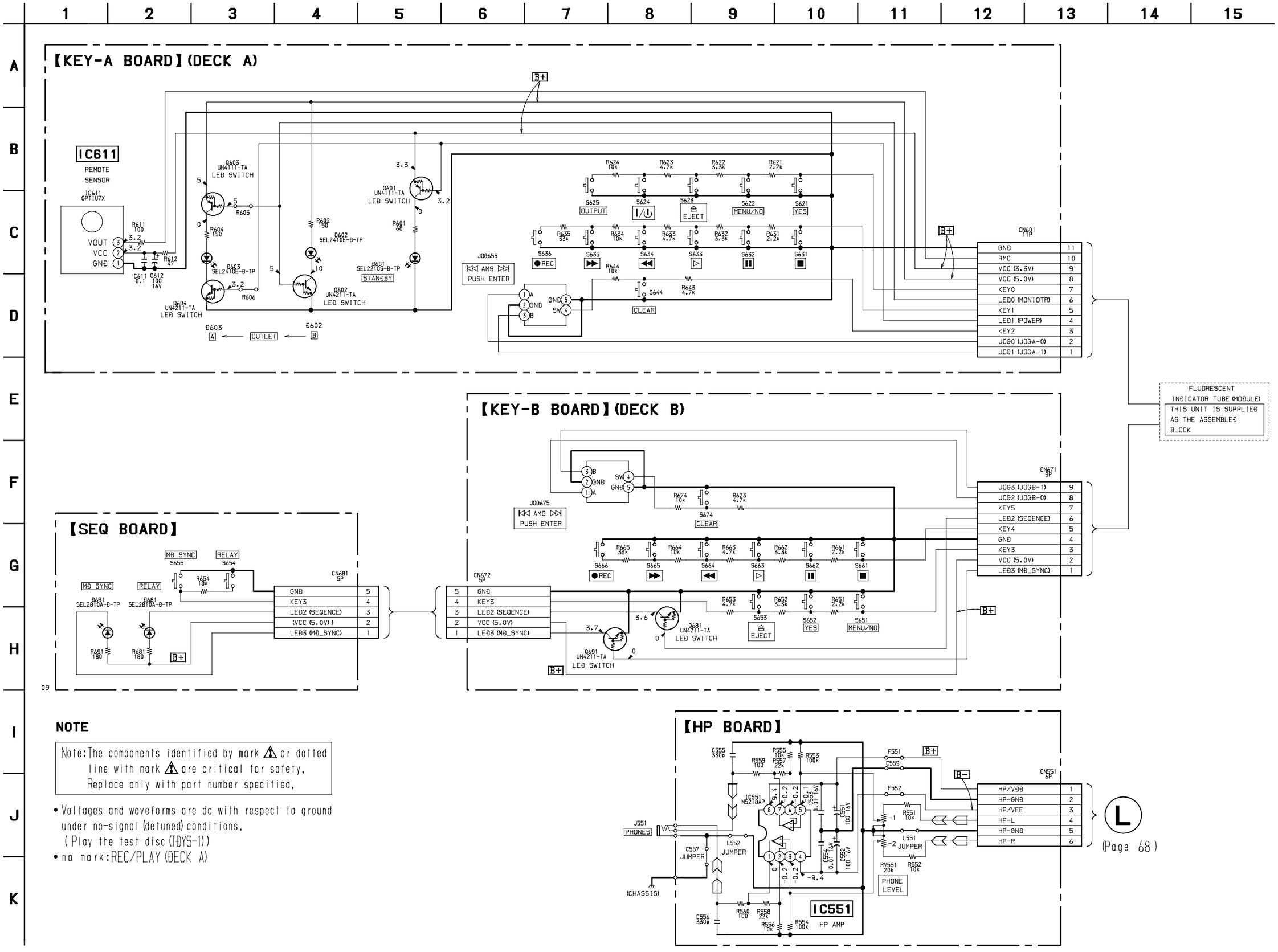
【KEY-B BOARD】(DECK B)



【SEQ BOARD】



6-18. SCHEMATIC DIAGRAM – PANEL SECTION –



NOTE

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

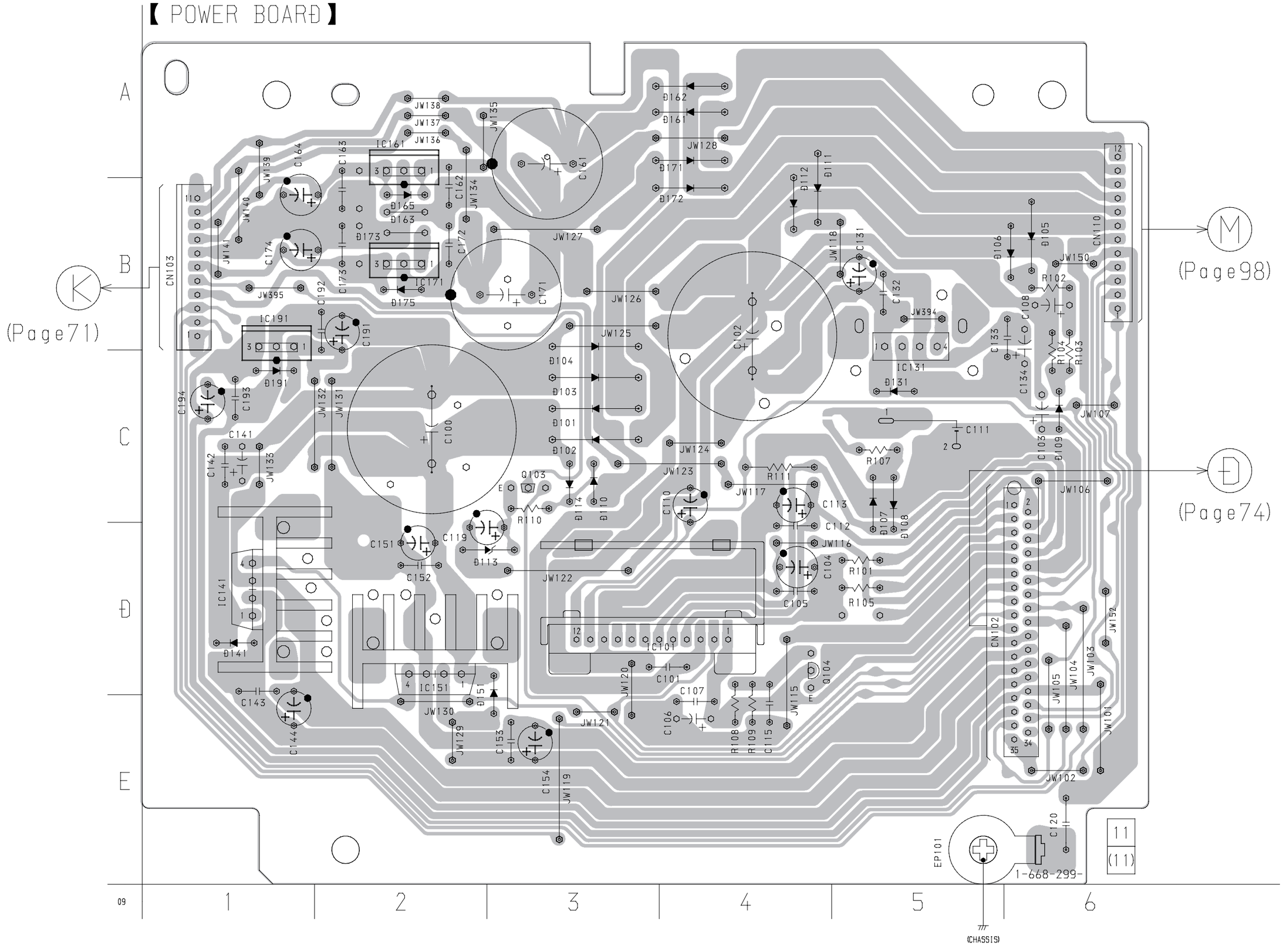
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions. (Play the test disc (TDYS-1))
- no mark: REC/PLAY (DECK A)

6-19. PRINTED WIRING BOARD – POWER SECTION –

• See page 50 for Circuit Boards Location.

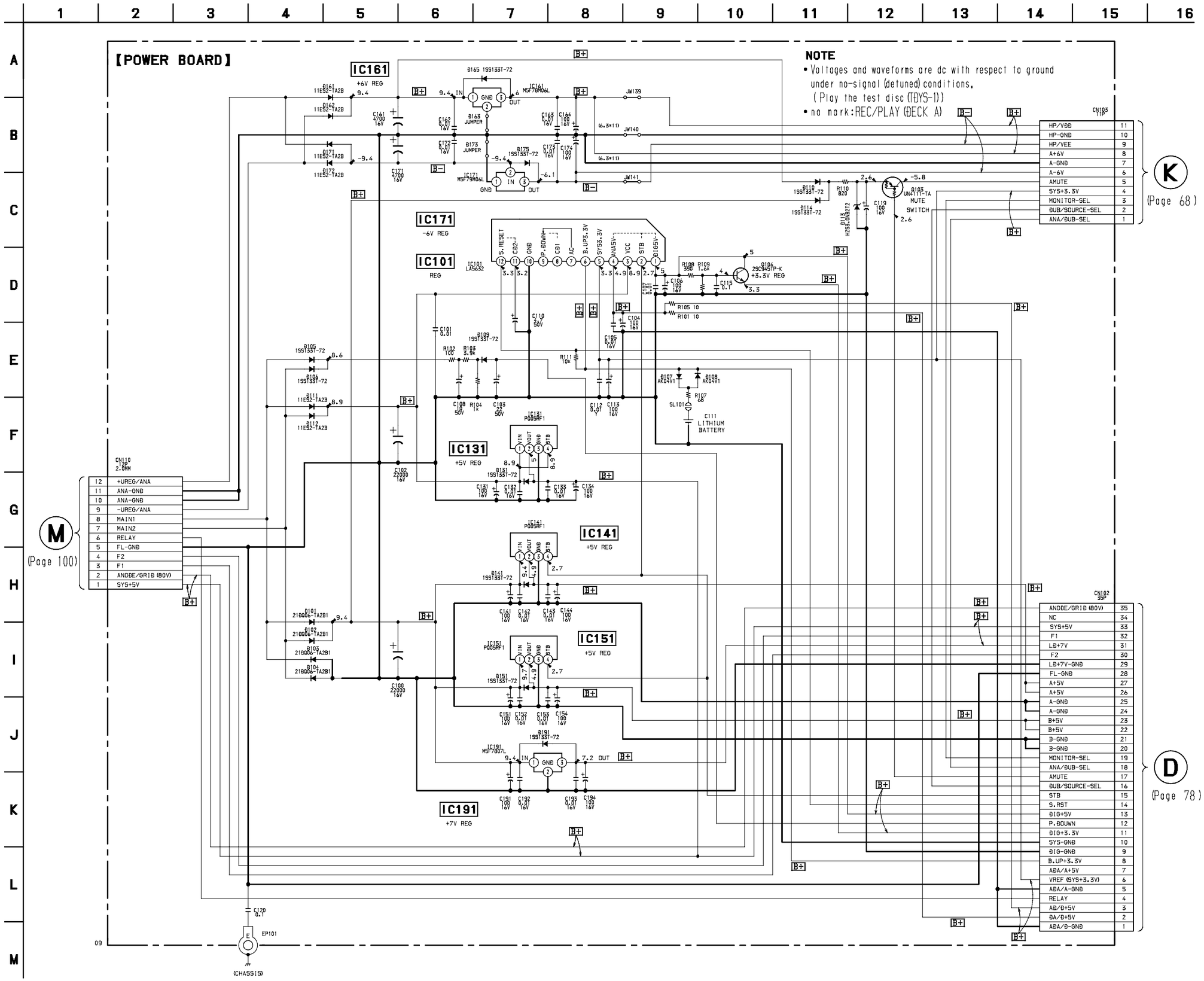
• Semiconductor Location

Ref. No.	Location
D101	C-3
D102	C-3
D103	C-3
D104	B-2
D105	B-6
D106	B-6
D107	C-5
D108	C-5
D109	C-6
D110	C-3
D111	B-4
D112	B-4
D113	D-3
D114	C-3
D131	C-5
D141	D-1
D151	D-3
D161	A-4
D162	A-4
D165	B-2
D171	A-4
D172	B-4
D175	B-2
D191	C-1
IC101	D-3
IC131	B-5
IC141	D-1
IC151	D-2
IC161	A-2
IC171	B-2
IC191	B-1
Q103	C-3
Q104	D-4



6-20. SCHEMATIC DIAGRAM – POWER SECTION –

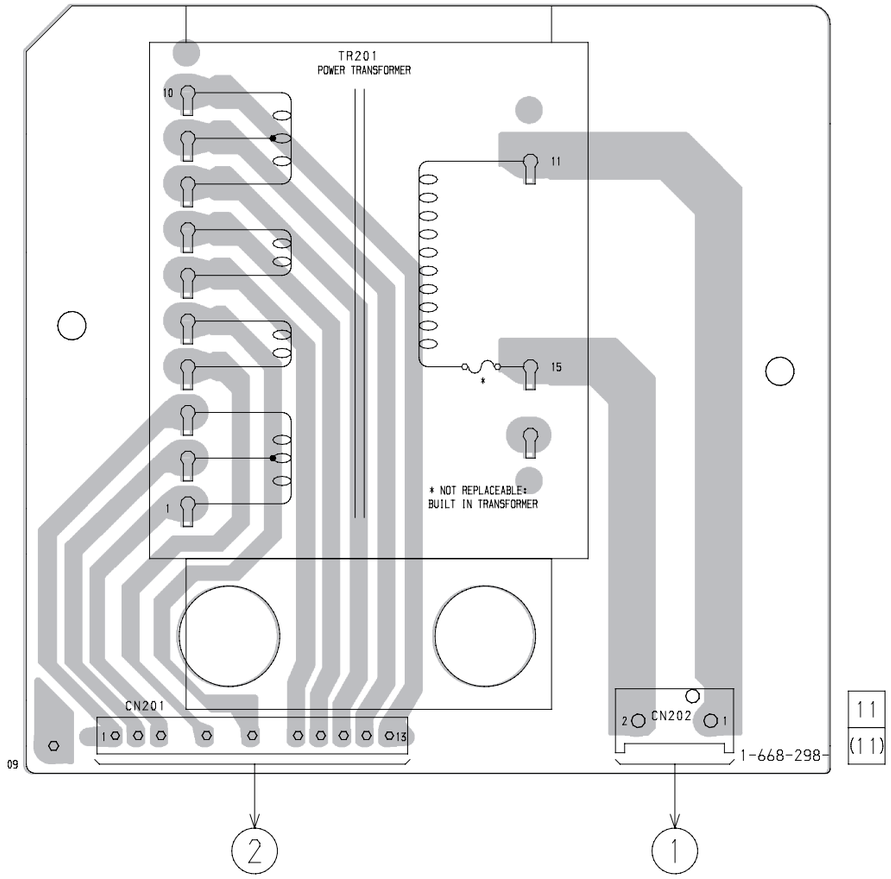
• See page 103 for IC Block Diagrams.



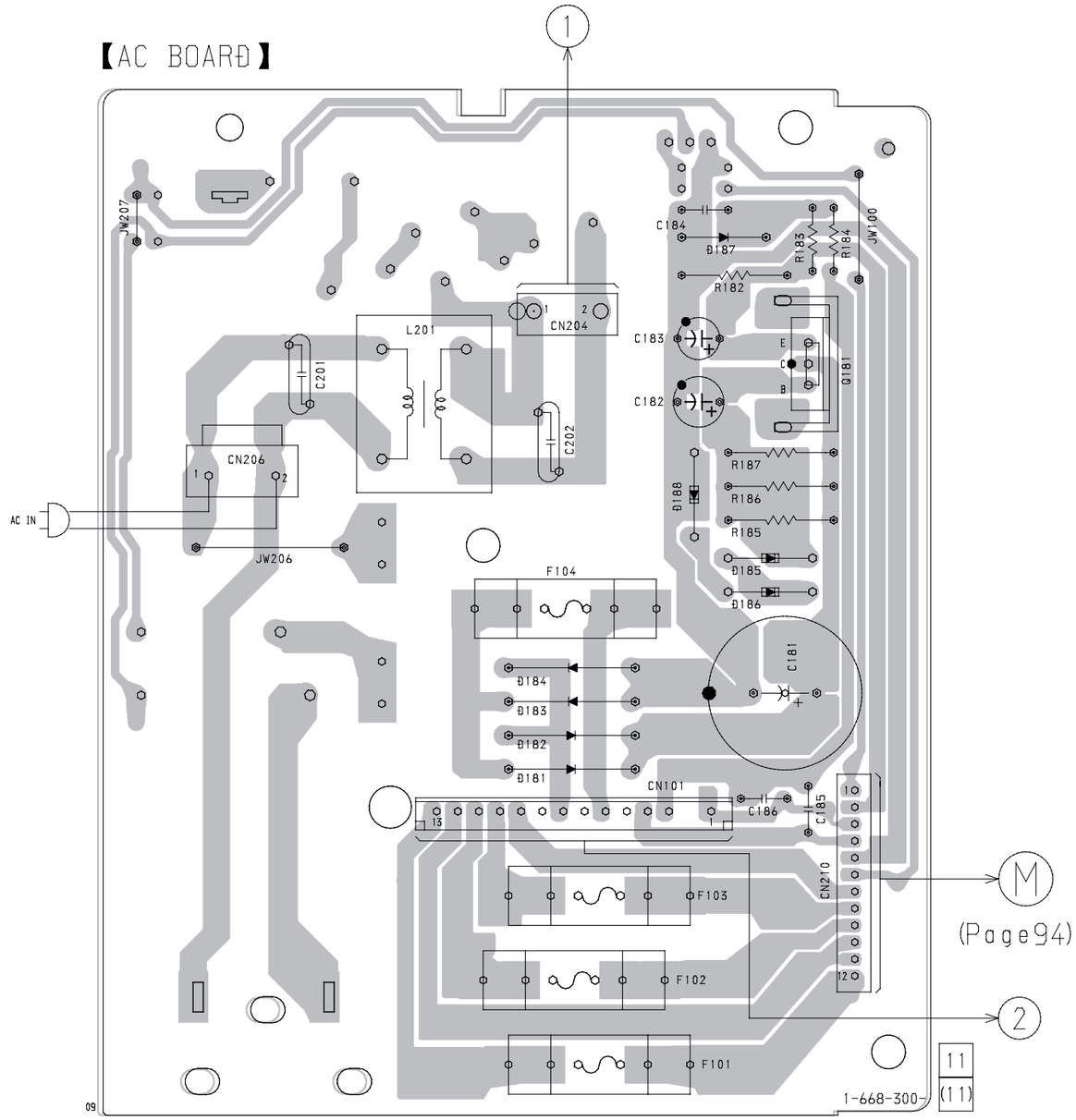
6-21. PRINTED WIRING BOARD – TRANS SECTION –

• See page 50 for Circuit Boards Location.

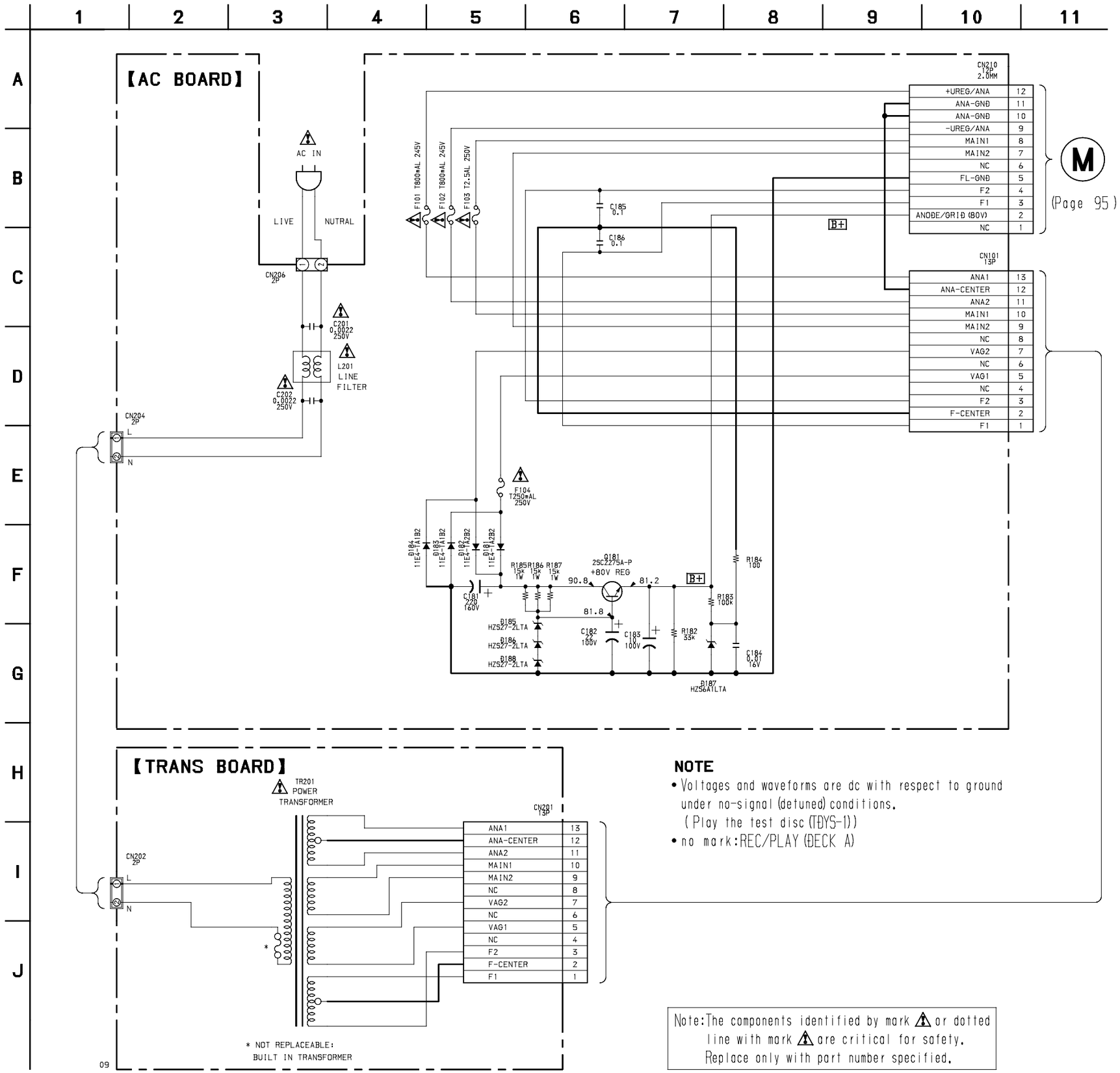
【TRANS BOARD】



【AC BOARD】



6-22. SCHEMATIC DIAGRAM – TRANS SECTION –



NOTE

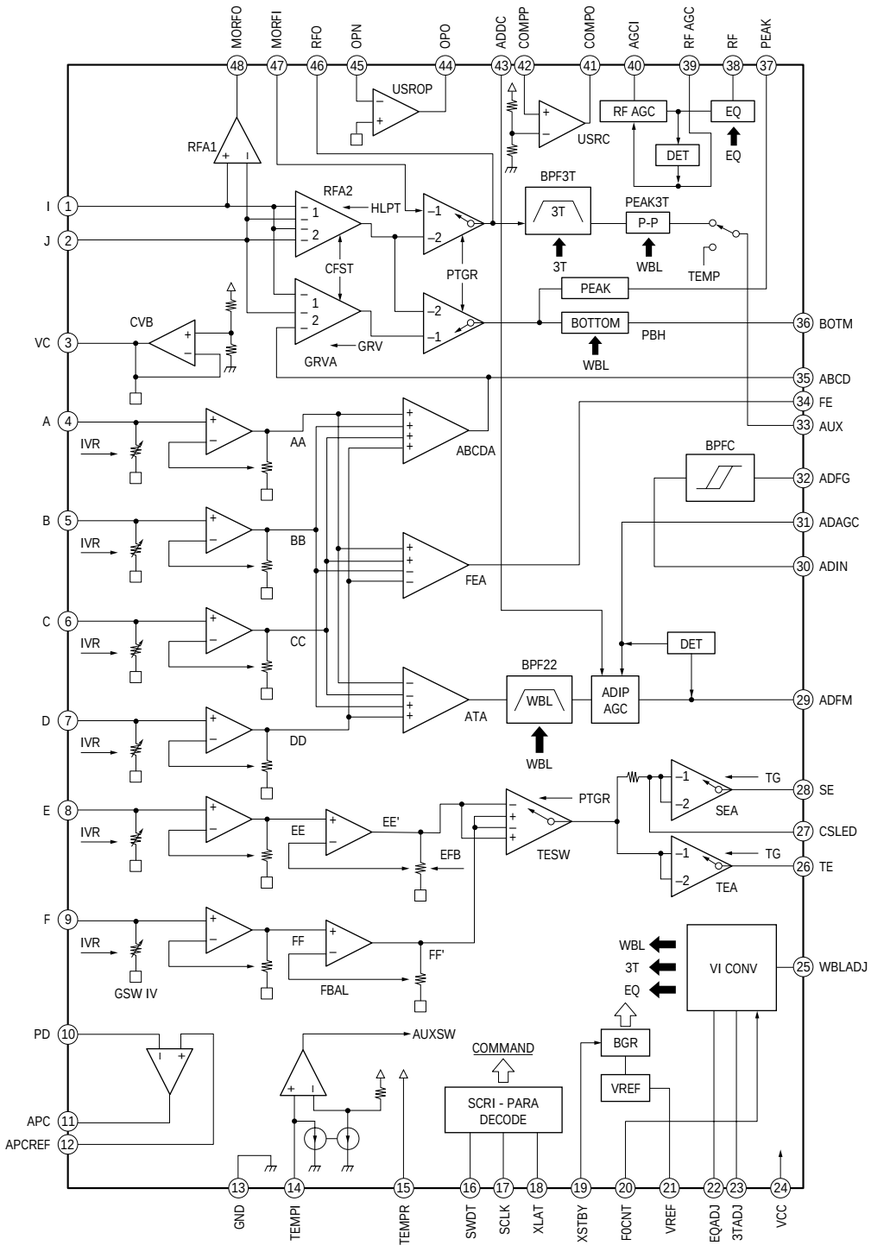
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  (Play the test disc (TBYS-1))
- no mark:REC/PLAY (DECK A)

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

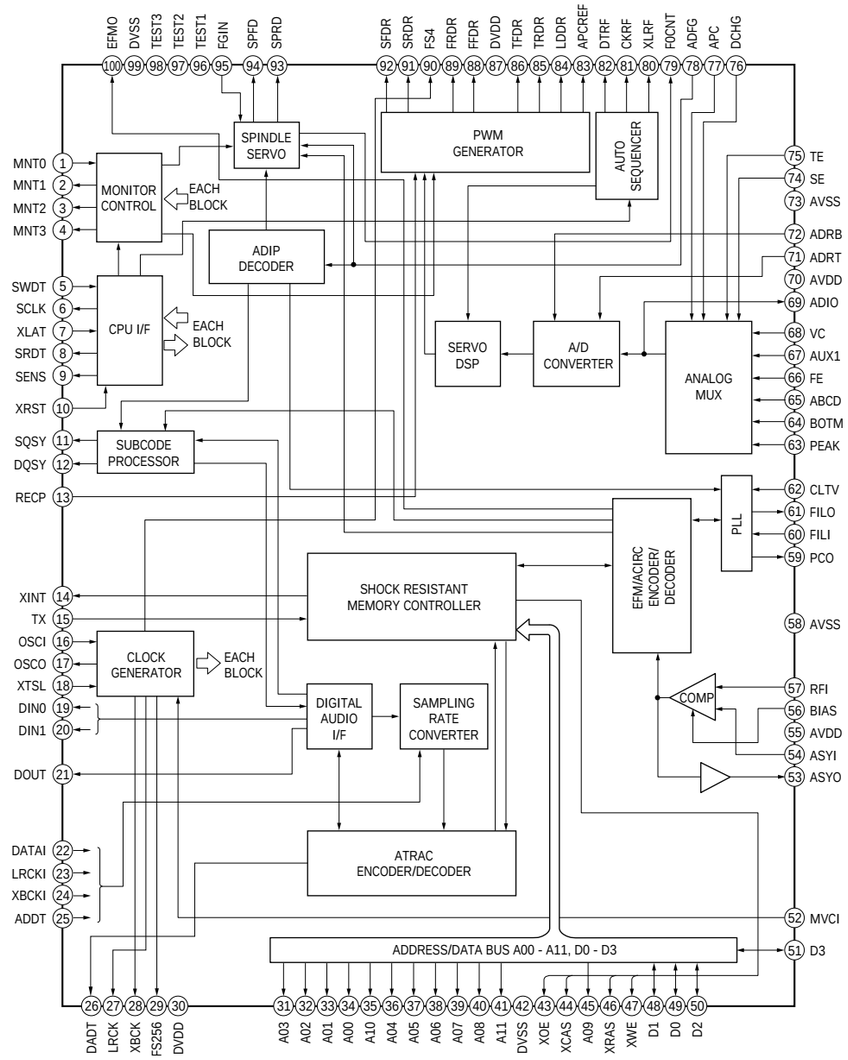
6-23. IC BLOCK DIAGRAMS

• **BD section**

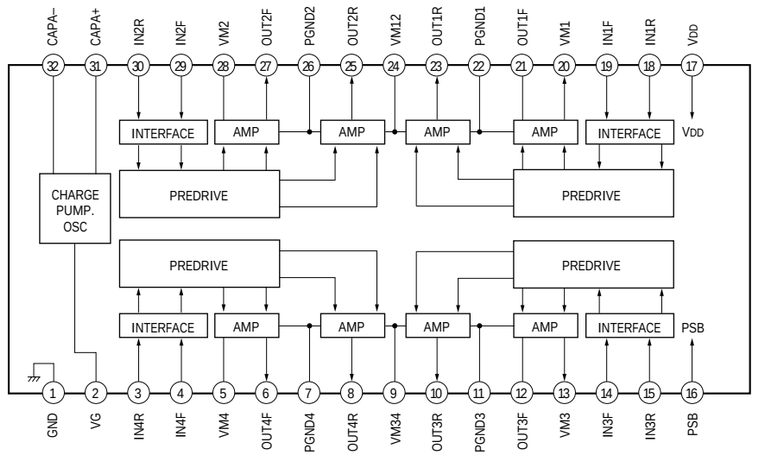
IC101 CXA2523AR



IC121 CXD2654R

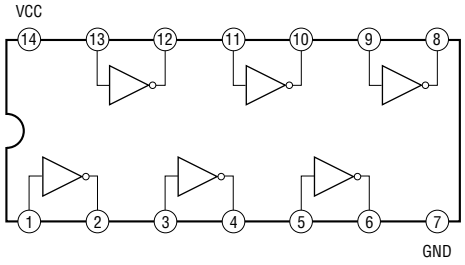


IC152 BH6511FS



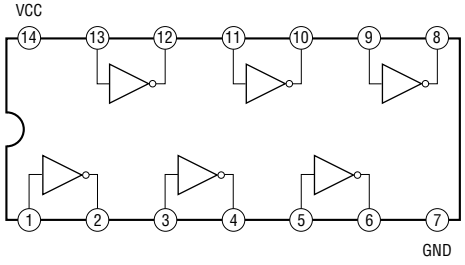
• **Jack (2/2) section**

IC501 SN74HCU04AN

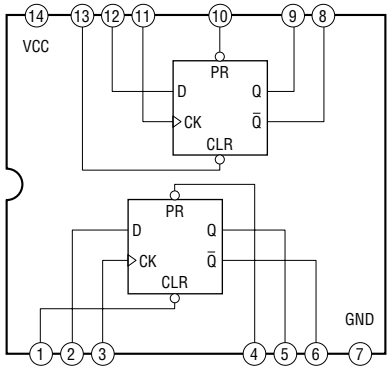


• **Main section**

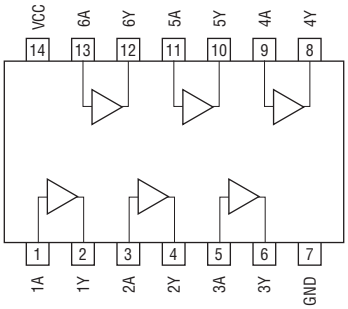
IC301 SN74HCU04APW-E20



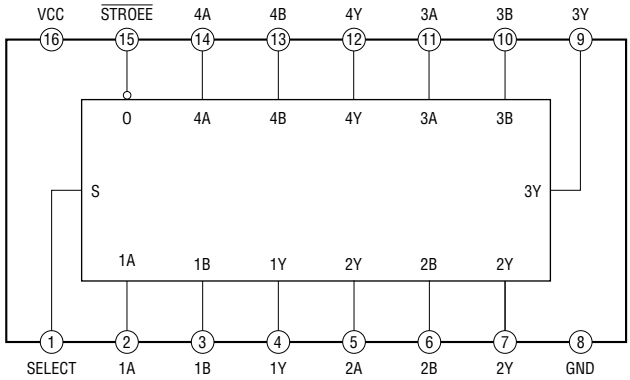
IC306 SN74HC74APW-E20



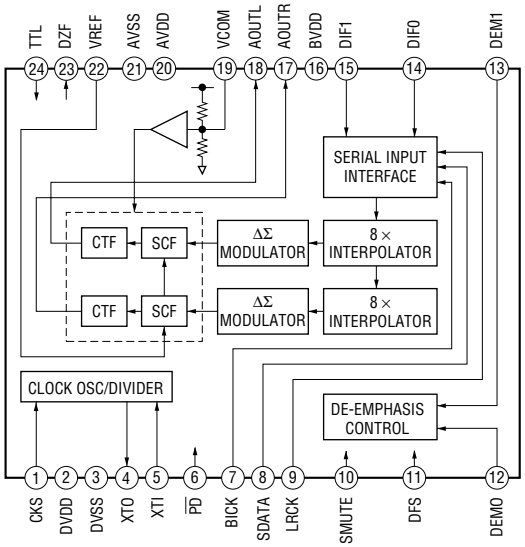
IC321,851, 861 TC74HCT7007AF (EL)



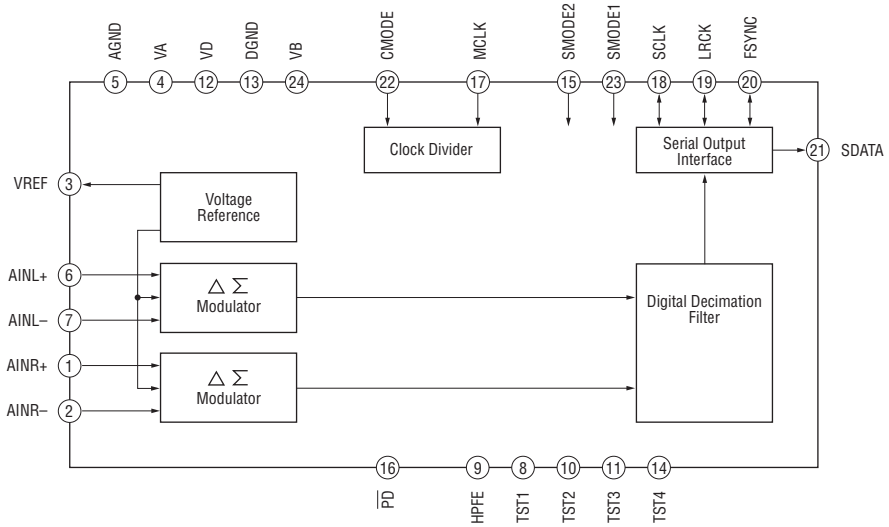
IC311, 316, 521 SN74HC157APW-E20



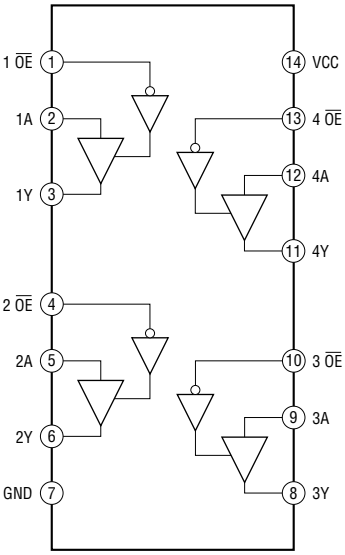
IC331, 351 AK4321-VF-E2



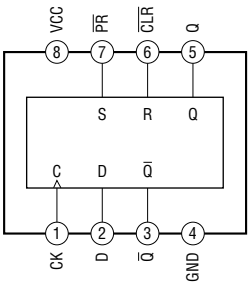
IC461 AK5352-VF-E2



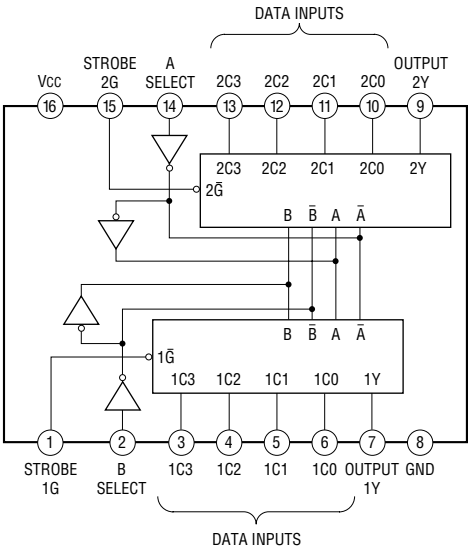
IC471, 831 SN74LVC125APW-E20



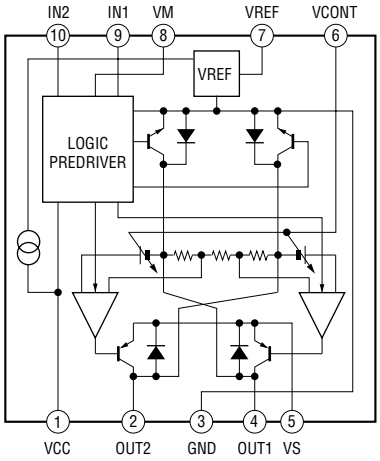
IC491 TC7W74FU (TE12R)



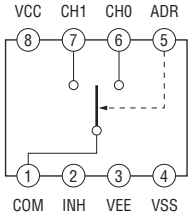
IC511, 516 SN74HC153APW-E20



IC751, 951 LB1830M-S-TE-L

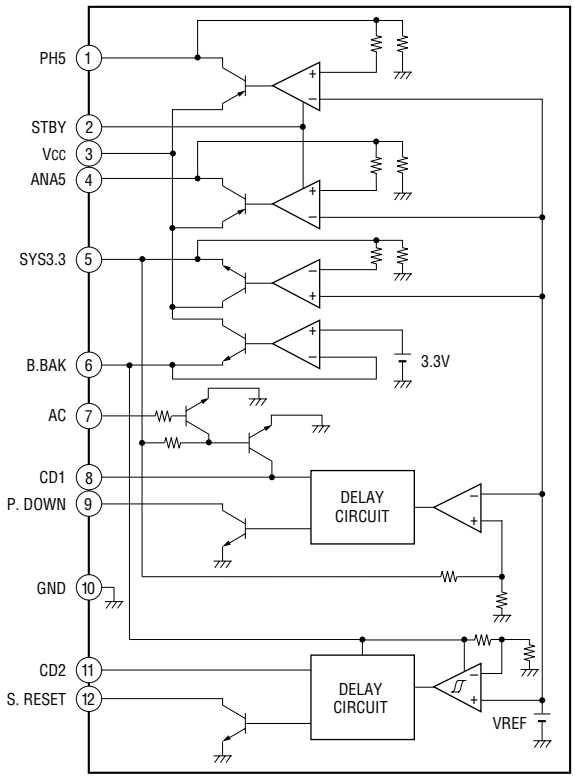


IC991 TC4W53FU-TE12L



• Power section

IC101 LA5632



6-24. IC PIN FUNCTIONS

• IC101 RF Amplifier (CXA2523AR)

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 CXD2654R
17	SCLK	I	Serial clock input from the CXD2654R
18	XLAT	I	Latch signal input from the CXD2654R "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 CXD2650R or CXD2654R
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 CXD2654R
27	CSLED	—	External capacitor connection pin for the sled error signal LPF
28	SE	O	Sled error signal output to the CXD2654R
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 CXD2654R
33	AUX	O	I3 signal/temperature signal output to the CXD2654R (Switching with a serial command)
34	FE	O	Focus error signal output to the CXD2654R
35	ABCD	O	Light amount signal output to the CXD2654R
36	BOTM	O	RF/ABCD bottom hold signal output to the CXD2654R
37	PEAK	O	RF/ABCD peak hold signal output to the CXD2654R
38	RF	O	RF equalizer output to the CXD2654R
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

• **IC121 Digital Signal Processor, Digital Servo Signal Processor, EFM/ACIRC Encoder/Decoder, Shock-proof Memory Controller, ATRAC Encoder/Decoder, 2M Bit DRAM (CXD2654R)**

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
17	OSCO	O	System clock output (Not used)
18	XTSL	I	System clock frequency setting "L": 45.1584 MHz, "H": 22.5792 MHz (Pull up at "H")
19	DIN0	I	Digital audio input (Optical input)
20	DIN1	I	
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	

* 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	Test terminal
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

• IC701 (DECK A) System Control (M30610MCA-254FP)

Pin No.	Pin Name	I/O	Function
1, 2	—	O	Not used
3	DA OUT0	O	
4	DA OUT1	O	
5	SQSY	I	ATP address sync or subcode Q sync input from CXD2654R
6	—	O	Not used
7	—	O	Not used
8	BYTE	I	Input switched by data bus (Connected to ground)
9	CNVSS	—	Ground
10	XIN-T	O	Not used
11	XOUT-T	O	
12	SYSTEM-RESET	I	System reset signal input "L":Reset
13	XOUT	O	Main click output (7.0 MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (7.0 MHz)
16	VCC	—	+3.3V power supply
17	NMI	I	
18	DQSY	I	Digital in U-bit from CXD2654R CD format subcode Q sync input
19	POWER-DOWN	I	Power down signal input "L":Power down
20	XINT	I	Interrupt status signal input from CXD26524R
21, 22	JOG 1, JOG 0	O	Not used
23, 24	—	O	Not used
25	—	O	Chip select signal output
26	MEC-CS	O	Chip select signal output
27	MEC-CTS	O	Serial CTS signal output
28	MEC-CLK	O	Serial clock signal output
29	MEC-RDT	I	Serial data in signal input
30	MEC-WDT	O	Serial data out signal output
31	SWDT	O	Write data signal output to serial bus
32	SRDT	I	Read data signal input from serial bus
33	SCLK	O	Clock signal output to serial bus
34	—	O	Not used
35	MAS-WDT	O	Serial data out signal output
36	MAS-RDT	I	Serial data in signal input
37	MAS-CLK	O	Serial clock signal output
38	MAS-RTS	O	Master reset signal output
39	MAS-CS	O	Master chip select signal output
40, 41	—	O	Not used
42, 43	DEM 1, DEM 0	O	D/A deemphasis setting signal output
44, 45	DIF 1, DIF 0	O	Not used
46	DUB/SOURCE-SEL	O	DUBBING SOURCE setting signal output "L":Deck A, "H":Deck B
47	AMUTE	O	Line mute signal output "H":ON, "L":OFF
48	ANA/DUB-SEL	O	A/D input selection signal output "H":Analog "L":DUB
49	OUTPUT-SEL	O	OUTPUT A/B selection signal output "L":Deck A "H":Deck B
50	STB	O	Strobe signal output to the power supply circuit "H":Power ON
51	—	O	Not used
52	DISC. IN-SW	I	Detection signal input from the disc detection switch
53	OUT-SW	I	Detection signal input from the loading out switch "L":Load out
54	—	O	Not used

Pin No.	Pin Name	I/O	Function
55	LD-OUT	O	Loading motor control output
56	LD-LOW	O	Loading motor voltage control output
57	LD-IN	O	Loading motor control output
58	—	O	Not used
59	REC. P	I	Detection signal input from the recording position detection switch
60	PB. P	I	Detection signal input from the playback position detection switch
61	—	O	Not used
62	VCC	O	+3.3V power supply
63	GAIN. SW	O	Gain switch signal output
64	GND	—	Ground
65	SENS	I	Internal status (SENS) input from CXD2654R
66	SHCK (MNT1)	I	Track jump signal input from CXD2654R
67	DIG-RST	O	Reset signal input to CXD2654R, motor driver “L”:Reset
68	BUSY (MNT2)	I	Monitoring of command execution status from CXD2654R
69	LDON	O	Laser power ON/OFF control output
70	REFLECT	I	Disc reflection detection signal input “H”:Low reflection rate disc
71	XLATCH	O	Latch signal input to serial bus
72	PROTECT	I	Recording prevention tab detection input from protect detection switch
73	MOD	O	High frequency superimpose ON/OFF control output
74	LIMIT-IN	I	Detection signal input from the limit in switch “L”:Sled limit in
75	WPOWER	O	BD write power ON/OFF signal output
76	SLOCK(MNT3)	I	Spindle servo lock status monitoring input from CXD2654R
77	FOK (MNT0)	I	Focus OK signal input from CXD2654R
78	SDA	I/O	Data signal input/output with backup memory
79	SCL	O	Clock signal output to backup memory
80	SCTX	O	Write data transmission timing output to CXD2654R
81	C. SET0	I	Destination selection pin for clock (Not used)
82	C. SET1	I	
83	DECK A/B-SEL	I	Deck A/B selection signal input “H”: Deck A, “L”: Deck B
84	DI-SEL1	O	D/A data format setting signal output
85	DI-SEL0	O	
86	—	O	Not used
87	ADDT-MUTE	O	A/D data mute ON/OFF signal output
88	W. SPEED-SEL	O	A/D MCLK select signal output “L”: 256fs, “H”: 512fs
89	SMUTE	O	D/A soft mute ON/OFF signal output
90	AD CLK-SEL	O	A/D LRCK, BCK select signal output “L”: LRCK, BCK of Deck A, “H”: LRCK, BCK OF Deck B
91	DA-RESET	I	D/A reset signal input “L”:Reset
92	AD-RESET	I	A/D reset signal input “L”:Reset
93	(KEY3)	O	Not used
94, 95	(KEY2) (KEY1)	O	
96	AVSS	—	Analog ground
97	(KEY0)	O	Not used
98	VREF	—	+3.3V power supply
99	+3.3V	—	
100	—	O	Not used

• IC801 Master Control (M30612MAA-202FP)

Pin No.	Pin Name	I/O	Function
1-5	—	O	Not used
6	REMOCOM	I	Remote controller Sircs input
7	—	O	Not used
8	BYTE	I	Data bus switching signal input
9	CNVSS	—	Ground
10	XIN-T	I	Clock input (32 kHz)
11	XOUT-T	O	Clock output (32 kHz)
12	SYSTEM-RESET	I	System reset signal input "L":Reset
13	XOUT	O	Main clock output (7.0 MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (7.0 MHz)
16	VCC	—	+3.3V power supply
17	NMI	I	
18	—	O	Not used
19	POWER-DOWN	I	Power down signal input "L":Power down
20	INT	I	Fluorescent display tube module input
21, 22	JOGA-0, JOGA-1	I	Jog control input for deck A
23, 24	JOGB-0, JOGB-1	I	Jog control input for deck B
25-28	—	O	Not used
29	MAS-A/CS	O	Communication chip select output for mechanism deck A
30	MAS-B/CS	O	Communication chip select output for mechanism deck B
31	MAS-B/WDT	O	Data out output for mechanism deck B
32	MAS-B/RDT	I	Data in input for mechanism deck B
33	MAS-B/CLK	O	Serial clock signal output for mechanism deck B
34	MAS-B/CTS	I	Master reset signal input for mechanism deck B
35	MAS-A/WDT	O	Data out output for mechanism deck A
36	MAS-A/RDT	I	Data in input for mechanism deck A
37	MAS-A/CLK	O	Serial clock signal output for mechanism deck A
38	MAS-A/CTS	I	Master reset signal input for mechanism deck A
39	RDY	O	Connected to +3.3V power supply
40	ALE	O	Not used
41	HOLE	I	Connected to +3.3V power supply
42	HLDA	O	Not used
43	BCLK	O	
44	$\overline{RD}$	O	Data bus lead output
45	BHE	O	Not used
46	$\overline{WR}$	O	Data bus write output
47, 48	CS	O	Chip select signal output
49, 50	—	O	Not used
51	DISP-CMD	O	Fluorescent display tube module data output
52	RELAY	O	Not used
53-59	—	—	Not used
60	I CKSET0	I	Destination selection pin for clock
61	I CKSET1	I	
62	VCC	—	+3.3V power supply
63	OPEN (A8)	—	Not used
64	GND	—	Ground

Pin No.	Pin Name	I/O	Function
65-72	DISPLAY D7-D0	O	Fluorescent display tube module data output
73-76	—	—	Not used
77	LED3 (MD SYNC)	O	MD SYNC LED output
78	LED2 (SEQUENCE)	O	SEQUENCE LED output
79	LED0 (MONITOR)	O	OUTPUT LED output
80	LED1 (POWER)	O	POWER LED output
81-88	—	O	Not used
89	KEY-7	O	
90	KEY-6	O	
91-95	KEY-5 – KEY-1	I	Key input pin (A/D input)
96	AVSS	—	Ground
97	KEY-0	I	Key input pin (A/D input)
98	VREF	—	+3.3V power supply
99	+3.3V	—	
100	—	O	Not used

• IC901 (DECK B) System Control (M30610MCA-254FP)

Pin No.	Pin Name	I/O	Function
1, 2	—	O	Not used
3	DA OUT0	O	
4	DA OUT1	O	
5	SQSY	I	ATP address sync or subcode Q sync input from CXD2654R
6	—	O	Not used
7	—	O	Not used
8	BYTE	I	Input switched by data bus (Connected to ground)
9	CNVSS	—	Ground
10	XIN-T	O	Not used
11	XOUT-T	O	
12	SYSTEM-RESET	I	System reset signal input "L":Reset
13	XOUT	O	Main click output (7.0 MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (7.0 MHz)
16	VCC	—	+3.3V power supply
17	NMI	I	
18	DQSY	I	Digital in U-bit from CXD2654R CD format subcode Q sync input
19	POWER-DOWN	I	Power down signal input "L":Power down
20	XINT	I	Interrupt status signal input from CXD26524R
21, 22	JOG 1, JOG 0	O	Not used
23, 24	—	O	Not used
25	—	O	Chip select signal output
26	MEC-CS	O	
27	MEC-CTS	O	Serial CTS signal output
28	MEC-CLK	O	Serial clock signal output
29	MEC-RDT	I	Serial data in signal input
30	MEC-WDT	O	Serial data out signal output
31	SWDT	O	Write data signal output to serial bus
32	SRDT	I	Read data signal input from serial bus
33	SCLK	O	Clock signal output to serial bus
34	—	O	Not used
35	MAS-WDT	O	Serial data out signal output
36	MAS-RDT	I	Serial data in signal input
37	MAS-CLK	O	Serial clock signal output
38	MAS-RTS	O	Master reset signal output
39	MAS-CS	O	Master chip select signal output
40, 41	—	O	Not used
42, 43	DEM 1, DEM 0	O	D/A deemphasis setting signal output
44, 45	DIF 1, DIF 0	O	Not used
46-49	—	O	
50	STB	O	Strobe signal output to the power supply circuit "H":Power ON
51	DATAI-SEL	O	Digital data select output
52	DISC. IN-SW	I	Detection signal input from the disc detection switch
53	OUT-SW	I	Detection signal input from the loading out switch "L":Load out
54	—	O	Not used

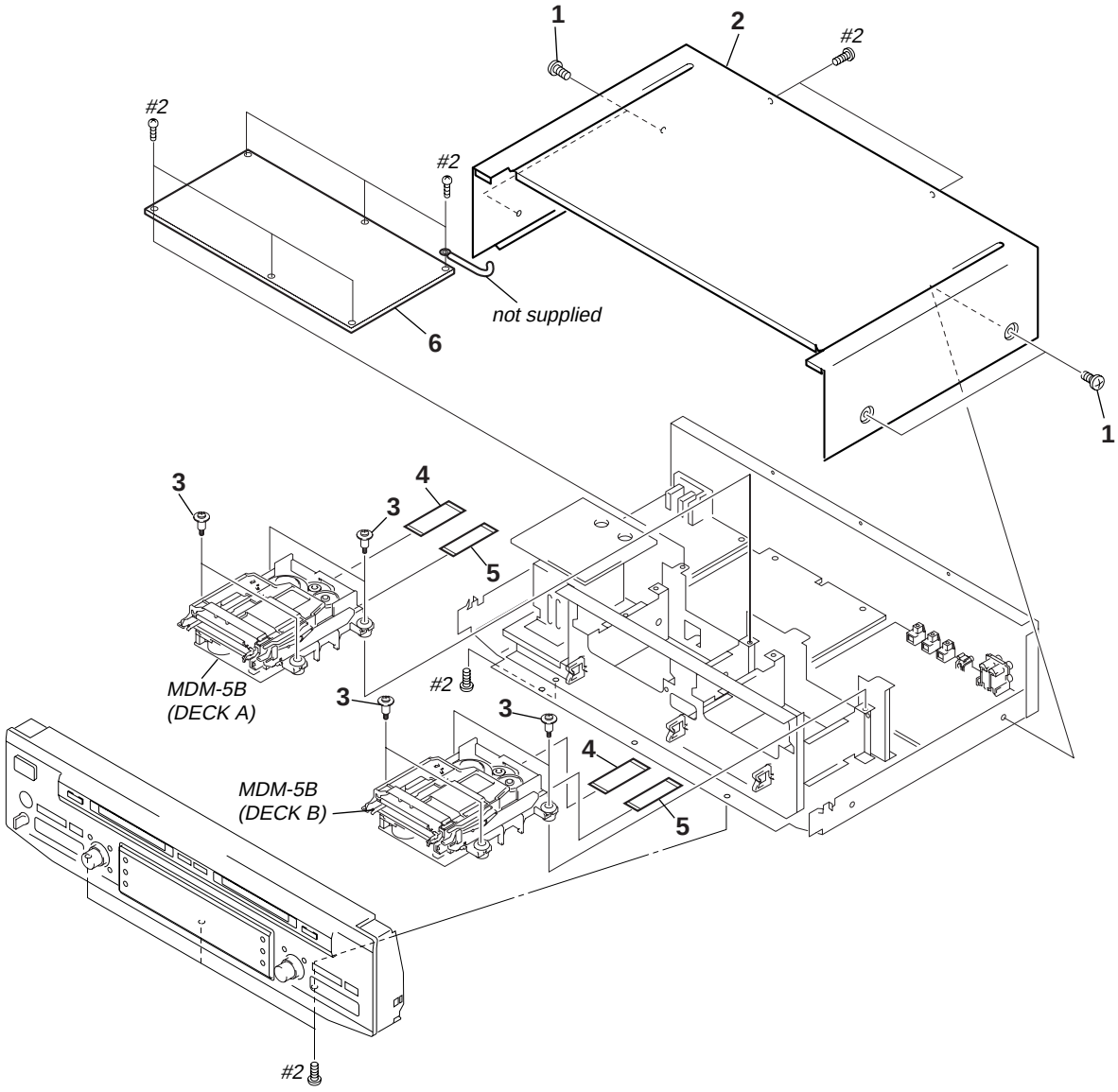
Pin No.	Pin Name	I/O	Function
55	LD-OUT	O	Loading motor control output
56	LD-LOW	O	Loading motor voltage control output
57	LD-IN	O	Loading motor control output
58	—	O	Not used
59	REC. P	I	Detection signal input from the recording position detection switch
60	PB. P	I	Detection signal input from the playback position detection switch
61	—	O	Not used
62	VCC	O	+3.3V power supply
63	GAIN. SW	O	Gain switch signal output
64	GND	—	Ground pin
65	SENS	I	Internal status (SENS) input from CXD2654R
66	SHCK (MNT1)	I	Track jump signal input from CXD2654R
67	DIG-RST	O	Reset signal input to CXD2654R, motor driver "L":Reset
68	BUSY (MNT2)	I	Monitoring of command execution status from CXD2654R
69	LDON	O	Laser power ON/OFF control output
70	REFLECT	I	Disc reflection detection signal input "H":Low reflection rate disc
71	XLATCH	O	Latch signal input to serial bus
72	PROTECT	I	Recording prevention tab detection input from protect detection switch
73	MOD	O	High frequency superimpose ON/OFF control output
74	LIMIT-IN	I	Detection signal input from the limit in switch "L":Sled limit in
75	WPOWER	O	BD write power ON/OFF signal output
76	SLOCK(MNT3)	I	Spindle servo lock status monitoring input from CXD2654R
77	FOK (MNT0)	I	Focus OK signal input from CXD2654R
78	SDA	I/O	Data signal input/output with backup memory
79	SCL	O	Clock signal output to backup memory
80	SCTX	O	Write data transmission timing output to CXD2654R
81	C. SET0	I	Destination selection pin for clock (Not used)
82	C. SET1	I	
83	DECK A/B-SEL	I	Deck A/B selection signal input
84	DI-SEL1	O	D/A data format setting signal output
85	DI-SEL0	O	
86	—	O	Not used
87	ANA/DUB-SEL	O	
88	SPEED-SEL	O	
89	SMUTE	O	D/A soft mute ON/OFF signal output
90	AMUTE	O	Not used
91	DA-RESET	I	D/A reset signal input "L":Reset
92	AD-RESET	I	A/D reset signal input "L":Reset
93	(KEY3)	O	Key input pin (Not used)
94, 95	(KEY2) (KEY1)	O	
96	AVSS	—	Analog ground pin
97	(KEY0)	I	Key input pin (Not used)
98	VREF	—	+3.3V power supply
99	+3.3V	—	
100	—	O	Not used

SECTION 7
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

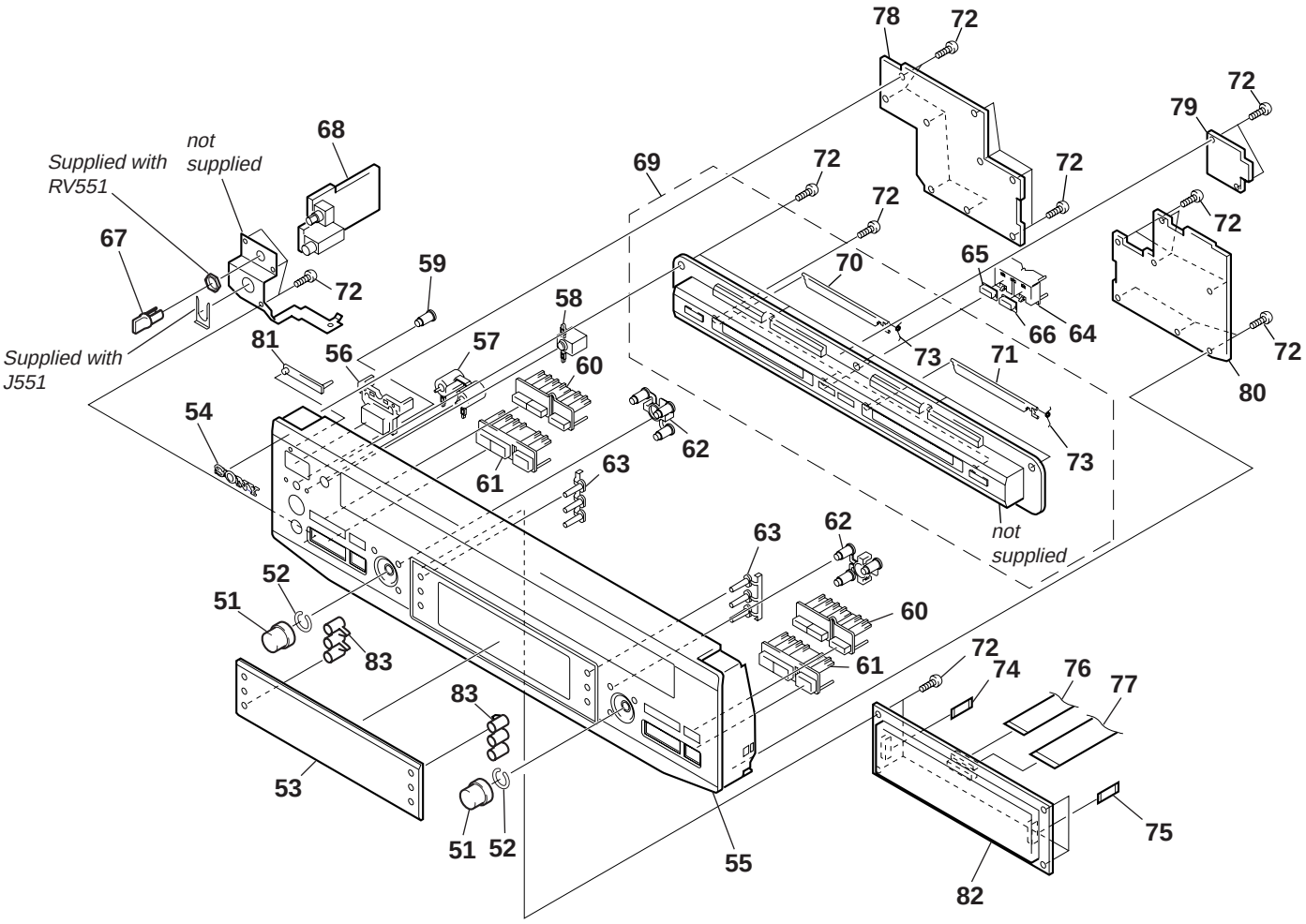
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

7-1. CASE SECTION



Ref. No.	Part No.	Description	Remark
1	4-210-291-01	SCREW (CASE 3 TP2)	
* 2	4-900-236-21	CASE	
3	4-999-839-01	SCREW (+BVTTWH M3), STEP	
4	1-783-177-11	WIRE (FLAT TYPE) (27 CORE)	
5	1-783-176-11	WIRE (FLAT TYPE) (23 CORE)	
* 6	A-4724-119-A	MAIN BOARD, COMPLETE	

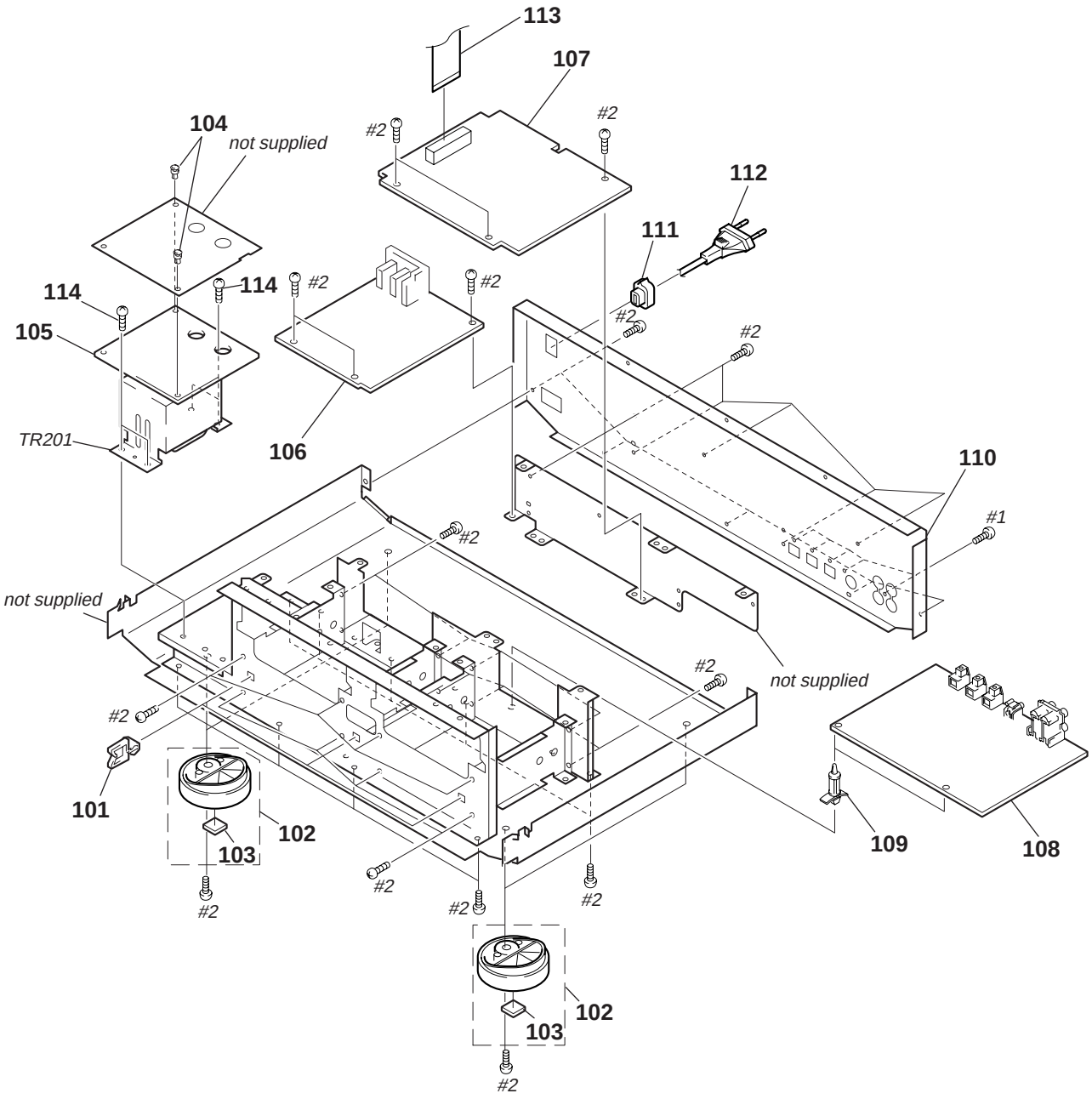
7-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	4-996-687-51	KNOB (AMS)	
52	3-354-981-01	SPRING (SUS), RING	
53	4-900-235-01	PLATE, INDICATION	
54	4-996-698-61	EMBLEM, SONY	
55	4-999-360-11	PANEL, FRONT	
56	4-996-683-21	BUTTON (POWER)	
* 57	4-900-228-01	INDICATOR (MONITOR)	
* 58	4-900-229-01	WINDOW (REMOTE CONTROL)	
59	4-900-227-11	BUTTON (MONITOR)	
60	4-900-230-11	BUTTON (FF/FR)	
61	4-900-231-11	BUTTON (PLAY)	
62	4-900-232-11	BUTTON (YES/NO)	
63	4-900-233-01	BUTTON (GOMA KEY)	
64	4-900-238-11	BUTTON (SEQUENCE)	
65	4-900-240-21	INDICATOR (SEQUENCE)	
66	4-900-240-31	INDICATOR (SEQUENCE)	
67	4-950-189-01	KNOB (A) (VOL)	

Ref. No.	Part No.	Description	Remark
* 68	1-668-304-11	HP BOARD	
69	X-4949-906-1	ESCUTCHEON ASSY	
70	4-996-690-71	LID (CARTRIDGE)	
71	4-996-690-81	LID (CARTRIDGE)	
72	4-951-620-01	SCREW (2.6X8), +BVTP	
73	4-976-593-01	SPRING (LID), TORSION	
74	1-783-591-11	WIRE (FLAT TYPE) (11 CORE)	
75	1-783-592-11	WIRE (FLAT TYPE) (9 CORE)	
76	1-783-174-11	WIRE (FLAT TYPE) (22 CORE)	
77	1-783-175-11	WIRE (FLAT TYPE) (17 CORE)	
* 78	A-4724-103-A	KEY-A BOARD, COMPLETE	
* 79	1-668-305-11	SEQ BOARD	
* 80	A-4724-104-A	KEY-B BOARD, COMPLETE	
81	4-996-682-11	INDICATOR	
82	1-517-746-11	INDICATOR TUBE, FLUORESCENT	
83	4-900-234-01	GUIDE (GOMA KEY)	

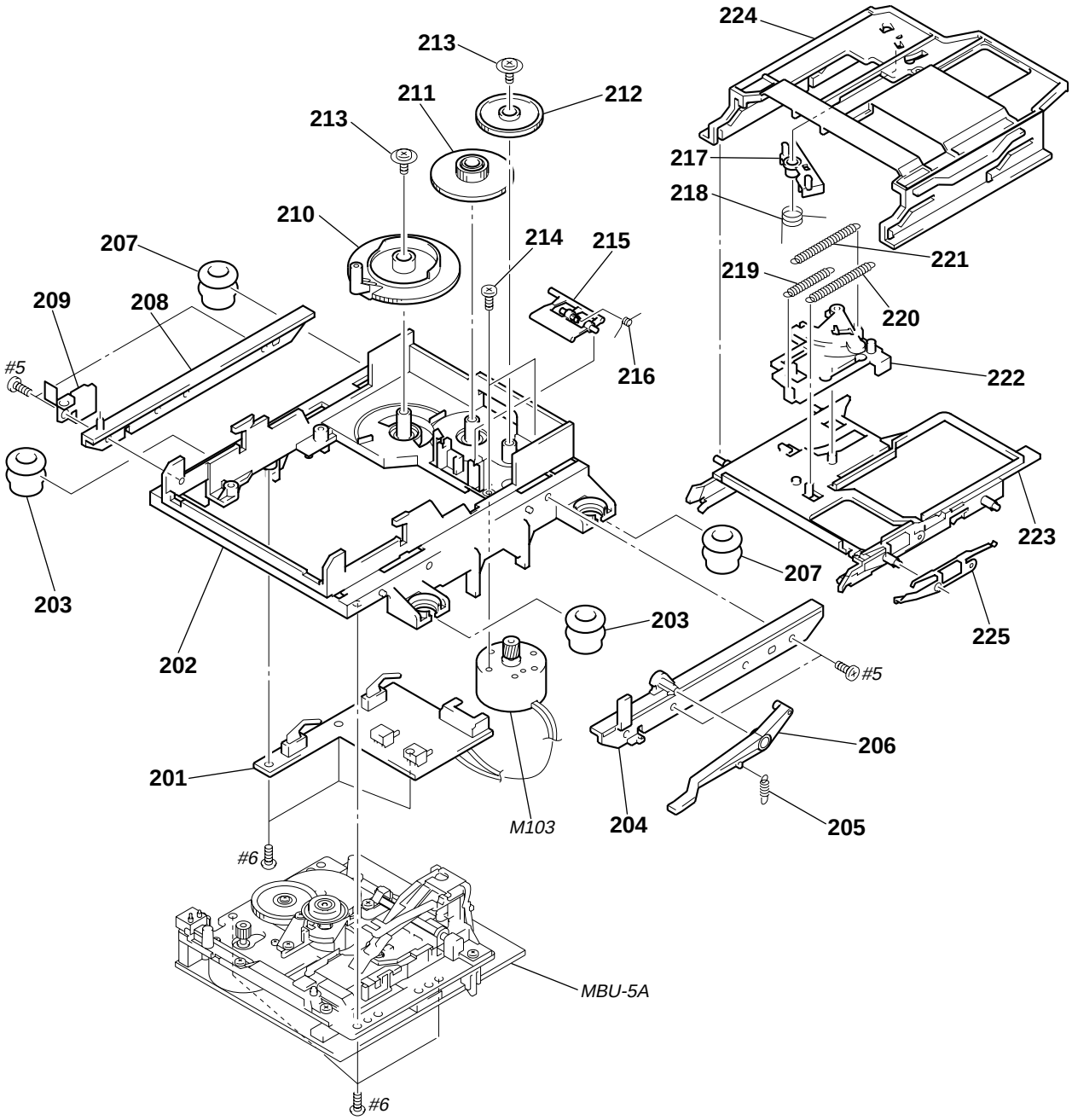
7-3. CHASSIS SECTION



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

Ref. No.	Part No.	Description	Remark
101	4-309-753-00	HOLDER, WIRE	
102	X-4947-389-1	FOOT ASSY (F50150S)	
103	4-983-762-02	CUSHION	
104	3-531-576-11	RIVET	
* 105	1-668-298-11	TRANS BOARD	
* 106	A-4724-116-A	AC BOARD, COMPLETE	
* 107	A-4724-115-A	POWER BOARD, COMPLETE	
* 108	A-4724-117-A	JACK BOARD, COMPLETE	
* 109	3-346-265-11	HOLDER, PC BOARD	
* 110	4-900-219-11	PANEL, BACK	
111	3-703-244-00	BUSHING (2104), CORD	
⚠ 112	1-575-651-21	CORD, POWER	
113	1-783-173-11	WIRE (FLAT TYPE) (31 CORE)	
114	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6	
⚠ TR201	1-431-720-11	TRANSFORMER, POWER	

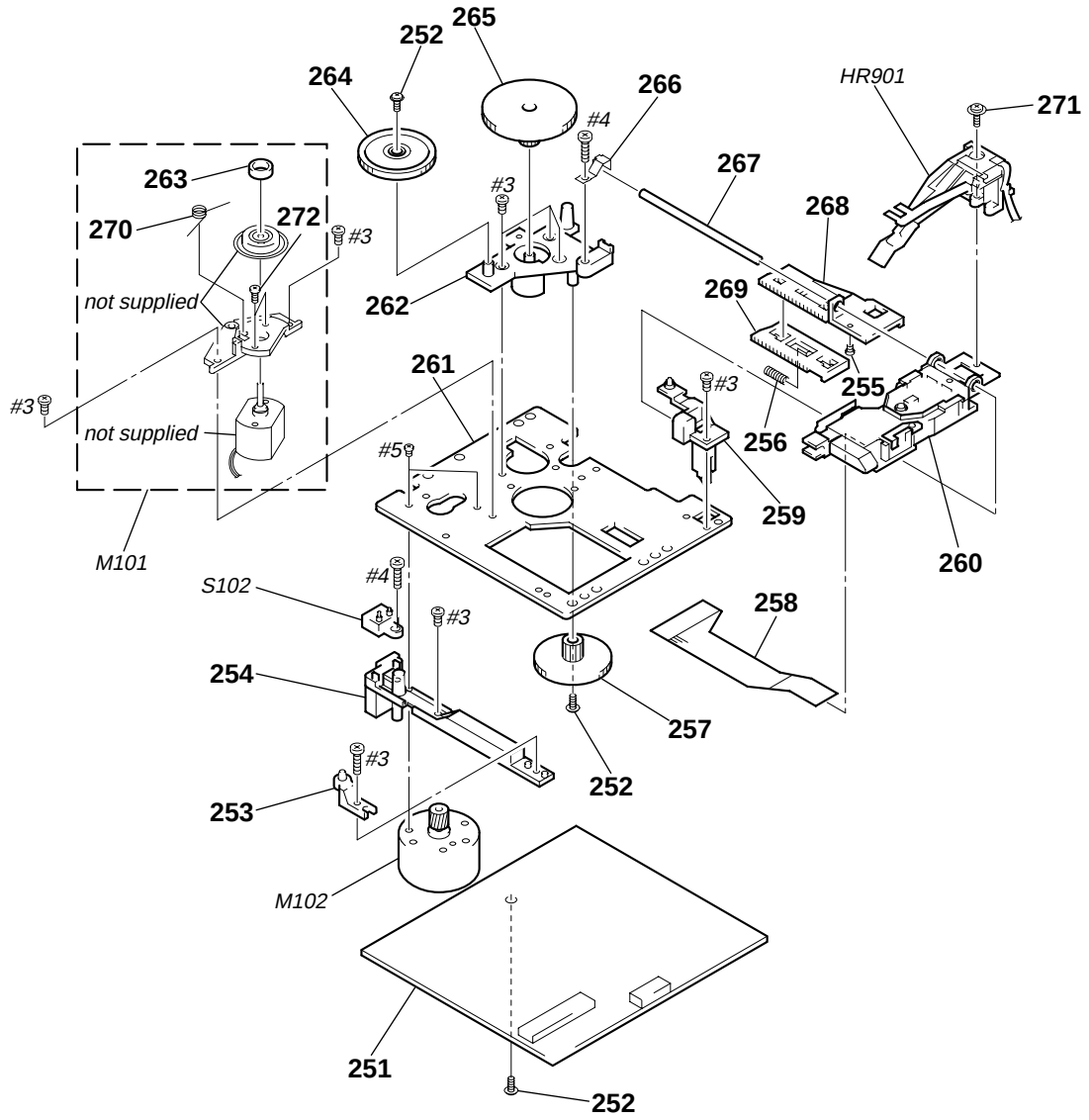
7-4. MECHANISM DECK SECTION (MDM-5B)



Ref. No.	Part No.	Description	Remark
* 201	1-668-111-11	SW BOARD	
* 202	4-996-217-01	CHASSIS	
203	4-996-223-01	INSULATOR (F)(BLACK)	
* 204	4-996-218-01	BRACKET (GUIDE R)	
205	4-996-277-01	SPRING (O/C), TENSION	
206	4-996-226-01	LEVER (O/C)	
207	4-999-347-01	INSULATOR (R)(GREEN)	
* 208	4-996-225-01	BRACKET (GUIDE L)	
209	4-988-466-21	SPRING (ELECTROSTATIC), LEAF	
210	4-996-219-01	GEAR (CAM GEAR)	
211	4-996-220-01	GEAR (A)	
212	4-996-221-01	GEAR (B)	
213	4-933-134-01	SCREW (+PTPWH M2.6X6)	
214	4-996-224-01	SCREW (1.7X3), +PWH	

Ref. No.	Part No.	Description	Remark
215	4-996-227-01	LEVER (HEAD)	
216	4-996-229-01	SPRING (HEAD LEVER), TORSION	
217	4-996-212-01	LEVER (LIMITTER)	
218	4-996-213-01	SPRING (LIMITTER), TORSION	
219	4-996-214-01	SPRING (SLIDER), TENSION	
220	4-996-216-01	SPRING (HOLDER), TENSION	
221	4-210-396-01	SPRING (LOCK), TENSION	
222	X-4949-246-1	SLIDER ASSY	
* 223	X-4949-245-1	HOLDER ASSY	
* 224	4-996-211-01	SLIDER (CAM)	
225	4-998-763-01	SPRING (SHUTTER), LEAF	
M103	X-4949-264-1	MOTOR ASSY, LOADING	

7-5. BASE UNIT SECTION (MBU-5B)



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

Ref. No.	Part No.	Description	Remark
* 251	A-4724-121-A	BD BOARD, COMPLETE	
252	3-372-761-01	SCREW (M1.7X4), TAPPING	
* 253	4-996-267-01	BASE (BU-D)	
* 254	4-996-255-01	BASE (BU-C)	
255	4-900-590-01	SCREW, PRECISION SMALL	
256	4-996-258-01	SPRING, COMPRESSION	
257	4-996-262-01	GEAR (SL-C)	
258	1-667-954-11	FLEXIBLE BOARD	
* 259	4-996-253-01	BASE (BU-A)	
⚠260	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1N	
* 261	4-996-252-01	CHASSIS, BU	
* 262	4-996-254-01	BASE (BU-B)	
263	4-967-688-11	MAGNET, ABSORPTION	
264	4-996-260-01	GEAR (SL-A)	
265	4-996-261-01	GEAR (SL-B)	
266	4-996-264-01	SPRING (SHAFT), LEAF	
267	4-996-265-01	SHAFT, MAIN	
268	4-996-256-01	SL (BASE)	
269	4-996-257-01	RACK (SL)	
270	4-996-263-01	SPRING (CLV), TORSION	
271	4-988-560-01	SCREW (+P 1.7X6)	
272	4-211-036-01	SCREW (1.7X2.5), +PWH	
HR901	1-500-502-11	HEAD, OVER WRITE	
M101	A-4672-475-A	MOTOR ASSY, SPINDLE	
M102	A-4672-474-A	MOTOR ASSY, SLED	
S102	1-762-148-21	SWITCH, PUSH (REFLECT/PROTECT)	

AC BD

SECTION 8
ELECTRICAL PARTS LIST

Note:

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

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

- 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.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H

Ref. No.	Part No.	Description			Remark
*	A-4724-116-A	AC BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C181	1-107-947-11	ELECT	220uF	20%	160V
C182	1-128-560-11	ELECT	22uF	20%	100V
C183	1-128-582-11	ELECT	10uF	20%	100V
C184	1-162-306-11	CERAMIC	0.01uF	20%	16V
C185	1-164-159-11	CERAMIC	0.1uF		50V
C186	1-164-159-11	CERAMIC	0.1uF		50V
⚠C201	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C202	1-113-920-11	CERAMIC	0.0022uF	20%	250V
		< CONNECTOR >			
CN101	1-691-775-11	PLUG (MICRO CONNECTOR) 13P			
CN204	1-564-321-00	PIN, CONNECTOR 2P			
CN206	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
CN210	1-568-672-11	CONNECTOR, BOARD TO BOARD 12P			
		< DIODE >			
D181	8-719-070-53	DIODE 11E4-TA1B2			
D182	8-719-070-53	DIODE 11E4-TA1B2			
D183	8-719-070-53	DIODE 11E4-TA1B2			
D184	8-719-070-53	DIODE 11E4-TA1B2			
D185	8-719-934-18	DIODE HZS27-2L			
D186	8-719-934-18	DIODE HZS27-2L			
D187	8-719-933-33	DIODE HZS6A1L			
D188	8-719-934-18	DIODE HZS27-2L			
		< FUSE >			
⚠F101	1-532-501-51	FUSE T800mAL/245V			
⚠F102	1-532-501-51	FUSE T800mAL/245V			
⚠F103	1-532-464-51	FUSE T2.5AL/250V			
⚠F104	1-532-273-51	FUSE CYLINDRICAL (TIME-LAG) T0.25AL/250V			
		< FUSE HOLDER >			
FH101	1-533-293-11	FUSE HOLDER			
FH102	1-533-293-11	FUSE HOLDER			
FH103	1-533-293-11	FUSE HOLDER			
FH104	1-533-293-11	FUSE HOLDER			
		< COIL >			
⚠L201	1-424-485-11	FILTER, LINE			
		< TRANSISTOR >			
Q181	8-729-141-58	TRANSISTOR 2SC2275A-QP			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R182	1-249-435-11	CARBON	33K	5%	1/4W
R183	1-249-441-11	CARBON	100K	5%	1/4W
R184	1-247-807-31	CARBON	100	5%	1/4W
R185	1-215-876-00	METAL OXIDE	15K	5%	1W
R186	1-215-876-00	METAL OXIDE	15K	5%	1W
R187	1-215-876-00	METAL OXIDE	15K	5%	1W
**********					
	A-4724-121-A	BD MOUNTED BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-125-822-11	TANTALUM	10uF	20%	10V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-125-822-11	TANTALUM	10uF	20%	10V
C104	1-125-822-11	TANTALUM	10uF	20%	10V
C105	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C108	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C112	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C113	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C115	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C116	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C117	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C118	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C119	1-125-822-11	TANTALUM	10uF	20%	10V
C121	1-125-822-11	TANTALUM	10uF	20%	10V
C122	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C132	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C133	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V

Ref. No.	Part No.	Description			Remark
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C146	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C153	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C156	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C158	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C164	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-125-822-11	TANTALUM	10uF	20%	10V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	100uF	20%	16V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-117-970-11	ELECT CHIP	22uF	20%	10V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C187	1-104-913-11	TANTAL. CHIP	100uF	20%	16V
C188	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C189	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C190	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C191	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C196	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C197	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-569-479-21	CONNECTOR, FPC 21P			
CN102	1-784-835-21	CONNECTOR (SMD) 27P			
CN103	1-784-834-21	CONNECTOR (SMD) 23P			
CN104	1-770-687-11	CONNECTOR, FFC/FPC 4P			
CN110	1-695-440-21	PIN, CONNECTOR (PC BOARD) 6P			
		< DIODE >			
D101	8-719-988-62	DIODE 1SS355			
D181	8-719-046-86	DIODE F1J6TP			
D183	8-719-046-86	DIODE F1J6TP			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			
IC103	8-729-903-10	IC TRANSISTOR FMW1			
IC121	8-752-389-44	IC CXD2654R			
IC123	8-759-096-87	IC TC7WU04FU(TE12R)			
IC124	8-759-334-38	IC MSM51V4400-70TS-K			
IC152	8-759-430-25	IC BH6511FS-E2			
IC171	8-759-487-04	IC BR24C02F-E2			
IC181	8-759-481-17	IC MC74ACT08DTR2			
IC192	8-759-460-72	IC BA033FP-E2			
		< COIL >			
L101	1-414-813-11	INDUCTOR	0uH		
L102	1-414-813-11	INDUCTOR	0uH		
L103	1-414-813-11	INDUCTOR	0uH		
L105	1-414-813-11	INDUCTOR	0uH		
L106	1-414-813-11	INDUCTOR	0uH		
L121	1-414-813-11	INDUCTOR	0uH		
L122	1-414-813-11	INDUCTOR	0uH		

Ref. No.	Part No.	Description			Remark
L151	1-412-029-11	INDUCTOR CHIP	10uH		
L152	1-412-029-11	INDUCTOR CHIP	10uH		
L153	1-412-032-11	INDUCTOR CHIP	100uH		
L154	1-412-032-11	INDUCTOR CHIP	100uH		
L161	1-414-813-11	INDUCTOR	0uH		
L162	1-414-813-11	INDUCTOR	0uH		
L181	1-216-295-91	SHORT 0			
		< TRANSISTOR >			
Q101	8-729-403-35	TRANSISTOR	UN5113		
Q102	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR		
Q103	8-729-402-93	TRANSISTOR	UN5214		
Q104	8-729-402-93	TRANSISTOR	UN5214		
Q162	8-729-101-07	TRANSISTOR	2SB798-DL		
Q163	8-729-403-35	TRANSISTOR	UN5113		
Q181	8-729-018-75	TRANSISTOR	2SJ278MY		
Q182	8-729-017-65	TRANSISTOR	2SK1764KY		
		< RESISTOR >			
R103	1-216-049-91	RES,CHIP	1K	5%	1/10W
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R106	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R107	1-216-113-00	METAL CHIP	470K	5%	1/10W
R109	1-216-295-91	SHORT	0		
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
R111	1-216-295-91	SHORT	0		
R112	1-216-089-91	RES,CHIP	47K	5%	1/10W
R113	1-216-049-91	RES,CHIP	1K	5%	1/10W
R114	1-216-025-91	RES,CHIP	100	5%	1/10W
R115	1-216-049-91	RES,CHIP	1K	5%	1/10W
R116	1-216-025-91	RES,CHIP	100	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W
R119	1-216-025-91	RES,CHIP	100	5%	1/10W
R120	1-216-025-91	RES,CHIP	100	5%	1/10W
R121	1-216-097-91	RES,CHIP	100K	5%	1/10W
R123	1-216-295-91	SHORT	0		
R124	1-216-025-91	RES,CHIP	100	5%	1/10W
R125	1-216-025-91	RES,CHIP	100	5%	1/10W
R127	1-216-025-91	RES,CHIP	100	5%	1/10W
R129	1-216-295-91	SHORT	0		
R131	1-216-073-00	METAL CHIP	10K	5%	1/10W
R132	1-216-097-91	RES,CHIP	100K	5%	1/10W
R133	1-216-117-00	METAL CHIP	680K	5%	1/10W
R134	1-216-049-91	RES,CHIP	1K	5%	1/10W
R135	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R136	1-216-049-91	RES,CHIP	1K	5%	1/10W
R137	1-216-295-91	SHORT	0		
R140	1-216-029-00	METAL CHIP	150	5%	1/10W
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-025-91	RES,CHIP	100	5%	1/10W
R145	1-216-073-00	METAL CHIP	10K	5%	1/10W
R146	1-216-037-00	METAL CHIP	330	5%	1/10W
R147	1-216-025-91	RES,CHIP	100	5%	1/10W
R148	1-216-045-00	METAL CHIP	680	5%	1/10W
R149	1-216-073-00	METAL CHIP	10K	5%	1/10W
R150	1-216-295-91	SHORT	0		

BD **HP** **JACK**

Ref. No.	Part No.	Description			Remark
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R158	1-216-097-91	RES,CHIP	100K	5%	1/10W
R159	1-216-097-91	RES,CHIP	100K	5%	1/10W
R160	1-216-295-91	SHORT	0		
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R162	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R163	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R164	1-216-045-00	METAL CHIP	680	5%	1/10W
R165	1-216-097-91	RES,CHIP	100K	5%	1/10W
R166	1-220-149-11	REGISTER	2.2	10%	1/2W
R167	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R169	1-219-724-11	METAL CHIP	1	1%	1/4W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R173	1-216-121-91	RES,CHIP	1M	5%	1/10W
R175	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R177	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R179	1-216-085-00	METAL CHIP	33K	5%	1/10W
R180	1-216-073-00	METAL CHIP	10K	5%	1/10W
R182	1-216-089-91	RES,CHIP	47K	5%	1/10W
R183	1-216-089-91	RES,CHIP	47K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-081-00	METAL CHIP	22K	5%	1/10W
R186	1-216-089-91	RES,CHIP	47K	5%	1/10W
R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R195	1-216-073-00	METAL CHIP	10K	5%	1/10W
R196	1-216-295-91	SHORT	0		
R197	1-216-295-91	SHORT	0		
		< SWITCH >			
S101	1-762-596-21	SWITCH, PUSH (1 KEY)(LIMIT IN)			
S102	1-762-148-21	SWITCH, SLIDE (REFLECT/PROTECT)			
**********					
*	1-668-304-11	HP BOARD *********			
		< CAPACITOR >			
C551	1-126-382-11	ELECT	100uF	20%	16V
C552	1-126-382-11	ELECT	100uF	20%	16V
C553	1-162-306-11	CERAMIC	0.01uF	20%	16V
C554	1-162-306-11	CERAMIC	0.01uF	20%	16V
C555	1-162-288-31	CERAMIC	330PF	10%	50V
C556	1-162-288-31	CERAMIC	330PF	10%	50V
		< CONNECTOR >			
CN551	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P			
		< IC >			
IC551	8-759-634-51	IC M5218AP			
		< JACK >			
J551	1-770-306-11	JACK (LARGE TYPE)(PHONES)			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R551	1-249-429-11	CARBON	10K	5%	1/4W
R552	1-249-429-11	CARBON	10K	5%	1/4W
R553	1-249-441-11	CARBON	100K	5%	1/4W
R554	1-249-441-11	CARBON	100K	5%	1/4W
R555	1-249-429-11	CARBON	10K	5%	1/4W
R556	1-249-429-11	CARBON	10K	5%	1/4W
R557	1-249-433-11	CARBON	22K	5%	1/4W
R558	1-249-433-11	CARBON	22K	5%	1/4W
R559	1-247-807-31	CARBON	100	5%	1/4W
R560	1-247-807-31	CARBON	100	5%	1/4W
		< VARIABLE RESISTOR >			
RV551	1-225-586-11	RES, VAR 20K (PHONE LEVEL)			
**********					
*	A-4724-117-A	JACK BOARD, COMPLETE **********			
		< CAPACITOR >			
C301	1-162-306-11	CERAMIC	0.01uF	20%	16V
C302	1-162-306-11	CERAMIC	0.01uF	20%	16V
C303	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C304	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C311	1-162-306-11	CERAMIC	0.01uF	20%	16V
C312	1-162-306-11	CERAMIC	0.01uF	20%	16V
C313	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C314	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C321	1-162-306-11	CERAMIC	0.01uF	20%	16V
C322	1-162-306-11	CERAMIC	0.01uF	20%	16V
C323	1-126-022-11	ELECT	47uF	20%	25V
C324	1-126-022-11	ELECT	47uF	20%	25V
C325	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C326	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C331	1-162-306-11	CERAMIC	0.01uF	20%	16V
C332	1-162-306-11	CERAMIC	0.01uF	20%	16V
C333	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C334	1-162-600-11	CERAMIC	0.0047uF	10%	16V
C341	1-126-009-81	ELECT	100uF	20%	16V
C342	1-126-009-81	ELECT	100uF	20%	16V
C371	1-126-022-11	ELECT	47uF	20%	25V
C372	1-126-022-11	ELECT	47uF	20%	25V
C373	1-130-481-00	MYLAR	0.0068uF	5%	50V
C374	1-130-481-00	MYLAR	0.0068uF	5%	50V
C375	1-130-471-00	MYLAR	0.001uF	5%	50V
C376	1-130-471-00	MYLAR	0.001uF	5%	50V
C377	1-162-306-11	CERAMIC	0.01uF	20%	16V
C378	1-162-306-11	CERAMIC	0.01uF	20%	16V
C381	1-126-022-11	ELECT	47uF	20%	25V
C382	1-126-022-11	ELECT	47uF	20%	25V
C383	1-130-481-00	MYLAR	0.0068uF	5%	50V
C384	1-130-481-00	MYLAR	0.0068uF	5%	50V
C385	1-130-471-00	MYLAR	0.001uF	5%	50V
C386	1-130-471-00	MYLAR	0.001uF	5%	50V
C387	1-162-306-11	CERAMIC	0.01uF	20%	16V
C388	1-162-306-11	CERAMIC	0.01uF	20%	16V
C391	1-126-022-11	ELECT	47uF	20%	25V

Ref. No.	Part No.	Description			Remark
C392	1-126-022-11	ELECT	47uF	20%	25V
C393	1-126-022-11	ELECT	47uF	20%	25V
C394	1-126-022-11	ELECT	47uF	20%	25V
C395	1-126-022-11	ELECT	47uF	20%	25V
C396	1-126-022-11	ELECT	47uF	20%	25V
C415	1-126-022-11	ELECT	47uF	20%	25V
C416	1-126-022-11	ELECT	47uF	20%	25V
C421	1-162-306-11	CERAMIC	0.01uF	20%	16V
C422	1-162-306-11	CERAMIC	0.01uF	20%	16V
C423	1-162-306-11	CERAMIC	0.01uF	20%	16V
C424	1-162-306-11	CERAMIC	0.01uF	20%	16V
C441	1-126-022-11	ELECT	47uF	20%	25V
C442	1-126-022-11	ELECT	47uF	20%	25V
C481	1-164-159-11	CERAMIC	0.1uF		50V
C482	1-126-933-11	ELECT	100uF	20%	16V
C483	1-136-165-00	FILM	0.1uF	5%	50V
C485	1-164-159-11	CERAMIC	0.1uF		50V
C486	1-126-933-11	ELECT	100uF	20%	16V
C487	1-136-165-00	FILM	0.1uF	5%	50V
C488	1-164-159-11	CERAMIC	0.1uF		50V
C491	1-164-159-11	CERAMIC	0.1uF		50V
C492	1-126-933-11	ELECT	100uF	20%	16V
C499	1-136-165-00	FILM	0.1uF	5%	50V
C501	1-162-306-11	CERAMIC	0.01uF	20%	16V
C502	1-126-933-11	ELECT	100uF	20%	16V
		< IC >			
IC301	8-759-532-62	IC NJM2121D			
IC311	8-759-532-62	IC NJM2121D			
IC321	8-759-532-62	IC NJM2121D			
IC331	8-759-532-62	IC NJM2121D			
IC371	8-759-634-51	IC M5218AP			
IC381	8-759-634-51	IC M5218AP			
IC411	8-759-532-62	IC NJM2121D			
IC421	8-759-532-62	IC NJM2121D			
IC481	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN 1)			
IC485	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN 2)			
IC491	8-749-012-69	IC GP1F38T (DIGITAL OPTICAL OUT 1)			
IC501	8-759-917-18	IC SN74HCU04AN			
		< JACK >			
J301	1-784-429-11	JACK, PIN 4P (ANALOG IN/OUT)			
J488	1-784-431-11	JACK, PIN 1P (COAXIAL IN)			
		< TRANSISTOR >			
Q301	8-729-900-80	TRANSISTOR DTC114ES			
Q302	8-729-422-57	TRANSISTOR UN4111			
Q303	8-729-422-57	TRANSISTOR UN4111			
Q304	8-729-422-57	TRANSISTOR UN4111			
Q321	8-729-900-80	TRANSISTOR DTC114ES			
Q322	8-729-422-57	TRANSISTOR UN4111			
Q323	8-729-422-57	TRANSISTOR UN4111			
Q324	8-729-422-57	TRANSISTOR UN4111			
Q341	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q342	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q343	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q344	8-729-141-30	TRANSISTOR 2SC3623A-LK			

Ref. No.	Part No.	Description			Remark
Q391	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q392	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q393	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q394	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q395	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q396	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q421	8-729-900-80	TRANSISTOR DTC114ES			
Q423	8-729-422-57	TRANSISTOR UN4111			
Q424	8-729-422-57	TRANSISTOR UN4111			
Q425	8-729-422-57	TRANSISTOR UN4111			
Q431	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q432	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q433	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q434	8-729-141-30	TRANSISTOR 2SC3623A-LK			
		< RESISTOR >			
R301	1-215-437-00	METAL	4.7K	1%	1/4W
R302	1-215-437-00	METAL	4.7K	1%	1/4W
R303	1-215-441-00	METAL	6.8K	1%	1/4W
R304	1-215-441-00	METAL	6.8K	1%	1/4W
R307	1-249-437-11	CARBON	47K	5%	1/4W
R308	1-249-437-11	CARBON	47K	5%	1/4W
R317	1-249-437-11	CARBON	47K	5%	1/4W
R318	1-249-437-11	CARBON	47K	5%	1/4W
R321	1-215-422-00	METAL	1.1K	1%	1/4W
R322	1-215-422-00	METAL	1.1K	1%	1/4W
R323	1-215-437-00	METAL	4.7K	1%	1/4W
R324	1-215-437-00	METAL	4.7K	1%	1/4W
R325	1-215-442-00	METAL	7.5K	1%	1/4W
R326	1-215-442-00	METAL	7.5K	1%	1/4W
R327	1-249-437-11	CARBON	47K	5%	1/4W
R328	1-249-437-11	CARBON	47K	5%	1/4W
R331	1-215-422-00	METAL	1.1K	1%	1/4W
R332	1-215-422-00	METAL	1.1K	1%	1/4W
R337	1-249-437-11	CARBON	47K	5%	1/4W
R338	1-249-437-11	CARBON	47K	5%	1/4W
R341	1-249-421-11	CARBON	2.2K	5%	1/4W F
R342	1-249-421-11	CARBON	2.2K	5%	1/4W F
R343	1-249-421-11	CARBON	2.2K	5%	1/4W F
R344	1-249-421-11	CARBON	2.2K	5%	1/4W F
R345	1-249-441-11	CARBON	100K	5%	1/4W
R346	1-249-441-11	CARBON	100K	5%	1/4W
R351	1-249-441-11	CARBON	100K	5%	1/4W
R352	1-249-441-11	CARBON	100K	5%	1/4W
R371	1-259-462-11	CARBON	27K	5%	1/6W
R372	1-259-462-11	CARBON	27K	5%	1/6W
R373	1-215-424-00	METAL	1.3K	1%	1/4W
R374	1-215-424-00	METAL	1.3K	1%	1/4W
R375	1-215-424-00	METAL	1.3K	1%	1/4W
R376	1-215-424-00	METAL	1.3K	1%	1/4W
R377	1-259-484-11	CARBON	220K	5%	1/6W
R378	1-259-484-11	CARBON	220K	5%	1/6W
R379	1-215-422-00	METAL	1.1K	1%	1/4W
R380	1-215-422-00	METAL	1.1K	1%	1/4W
R381	1-259-462-11	CARBON	27K	5%	1/6W
R382	1-259-462-11	CARBON	27K	5%	1/6W
R383	1-215-424-00	METAL	1.3K	1%	1/4W

JACK **KEY-A**

Ref. No.	Part No.	Description			Remark
R384	1-215-424-00	METAL	1.3K	1%	1/4W
R385	1-215-424-00	METAL	1.3K	1%	1/4W
R386	1-215-424-00	METAL	1.3K	1%	1/4W
R387	1-259-484-11	CARBON	220K	5%	1/6W
R388	1-259-484-11	CARBON	220K	5%	1/6W
R389	1-215-422-00	METAL	1.1K	1%	1/4W
R390	1-215-422-00	METAL	1.1K	1%	1/4W
R391	1-249-421-11	CARBON	2.2K	5%	1/4W F
R392	1-249-421-11	CARBON	2.2K	5%	1/4W F
R393	1-249-421-11	CARBON	2.2K	5%	1/4W F
R394	1-249-421-11	CARBON	2.2K	5%	1/4W F
R395	1-249-441-11	CARBON	100K	5%	1/4W
R396	1-249-441-11	CARBON	100K	5%	1/4W
R397	1-259-484-11	CARBON	220K	5%	1/6W
R398	1-259-484-11	CARBON	220K	5%	1/6W
R399	1-259-424-11	CARBON	680	5%	1/6W
R400	1-259-424-11	CARBON	680	5%	1/6W
R401	1-249-421-11	CARBON	2.2K	5%	1/4W F
R402	1-249-421-11	CARBON	2.2K	5%	1/4W F
R403	1-249-441-11	CARBON	100K	5%	1/4W
R411	1-259-416-11	CARBON	330	5%	1/6W
R412	1-259-416-11	CARBON	330	5%	1/6W
R417	1-249-439-11	CARBON	68K	5%	1/4W
R418	1-249-439-11	CARBON	68K	5%	1/4W
R423	1-259-484-11	CARBON	220K	5%	1/6W
R424	1-259-484-11	CARBON	220K	5%	1/6W
R429	1-249-437-11	CARBON	47K	5%	1/4W
R430	1-249-437-11	CARBON	47K	5%	1/4W
R433	1-259-484-11	CARBON	220K	5%	1/6W
R434	1-259-484-11	CARBON	220K	5%	1/6W
R439	1-249-437-11	CARBON	47K	5%	1/4W
R440	1-249-437-11	CARBON	47K	5%	1/4W
R441	1-249-421-11	CARBON	2.2K	5%	1/4W F
R442	1-249-421-11	CARBON	2.2K	5%	1/4W F
R443	1-249-421-11	CARBON	2.2K	5%	1/4W F
R444	1-249-421-11	CARBON	2.2K	5%	1/4W F
R445	1-215-422-00	METAL	1.1K	1%	1/4W
R446	1-215-422-00	METAL	1.1K	1%	1/4W
R447	1-215-422-00	METAL	1.1K	1%	1/4W
R448	1-215-422-00	METAL	1.1K	1%	1/4W
R449	1-249-441-11	CARBON	100K	5%	1/4W
R450	1-249-441-11	CARBON	100K	5%	1/4W
R451	1-249-441-11	CARBON	100K	5%	1/4W
R481	1-249-429-11	CARBON	10K	5%	1/4W
R485	1-249-429-11	CARBON	10K	5%	1/4W
R488	1-247-804-11	CARBON	75	5%	1/4W
R501	1-247-807-31	CARBON	100	5%	1/4W
R502	1-249-429-11	CARBON	10K	5%	1/4W
R503	1-247-807-31	CARBON	100	5%	1/4W
R505	1-247-807-31	CARBON	100	5%	1/4W
R506	1-249-429-11	CARBON	10K	5%	1/4W
R507	1-247-807-31	CARBON	100	5%	1/4W
R509	1-247-807-31	CARBON	100	5%	1/4W
R510	1-249-441-11	CARBON	100K	5%	1/4W
R511	1-247-807-31	CARBON	100	5%	1/4W
R514	1-247-903-00	CARBON	1M	5%	1/4W
R515	1-247-807-31	CARBON	100	5%	1/4W

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Ref. No.	Part No.	Description			Remark
*	A-4724-103-A	KEY-A BOARD, COMPLETE			
		**********			
*	3-362-478-01	HOLDER (T), LED			
		< CAPACITOR >			
C611	1-164-159-11	CERAMIC	0.1uF		50V
C612	1-126-382-11	ELECT	100uF	20%	16V
		< CONNECTOR >			
CN601	1-779-279-11	CONNECTOR,FFC(LIF(NON-ZIF))11P			
		< DIODE >			
D601	8-719-301-39	DIODE SEL2210S-D (STANDBY)			
D602	8-719-301-44	DIODE SEL2410E-D (OUTPUT B)			
D603	8-719-301-44	DIODE SEL2410E-D (OUTPUT A)			
		< IC >			
IC611	8-749-013-92	IC GPT1U7X			
		< ENCODER >			
JOG655	1-475-543-11	ENCODER, ROTARY (⏮ AMS ⏭ PUSH ENTER (DECK A))			
		< TRANSISTOR >			
Q601	8-729-422-57	TRANSISTOR UN4111			
Q602	8-729-900-80	TRANSISTOR DTC114ES			
Q603	8-729-422-57	TRANSISTOR UN4111			
Q604	8-729-900-80	TRANSISTOR DTC114ES			
		< RESISTOR >			
R601	1-249-403-11	CARBON	68	5%	1/4W F
R602	1-249-407-11	CARBON	150	5%	1/4W F
R604	1-249-407-11	CARBON	150	5%	1/4W F
R611	1-247-807-31	CARBON	100	5%	1/4W
R612	1-249-401-11	CARBON	47	5%	1/4W F
R621	1-249-421-11	CARBON	2.2K	5%	1/4W F
R622	1-247-843-11	CARBON	3.3K	5%	1/4W
R623	1-249-425-11	CARBON	4.7K	5%	1/4W F
R624	1-249-429-11	CARBON	10K	5%	1/4W
R631	1-249-421-11	CARBON	2.2K	5%	1/4W F
R632	1-247-843-11	CARBON	3.3K	5%	1/4W
R633	1-249-425-11	CARBON	4.7K	5%	1/4W F
R634	1-249-429-11	CARBON	10K	5%	1/4W
R635	1-249-435-11	CARBON	33K	5%	1/4W
R643	1-249-425-11	CARBON	4.7K	5%	1/4W F
R644	1-249-429-11	CARBON	10K	5%	1/4W
		< SWITCH >			
S621	1-762-875-21	SWITCH, KEYBOARD (YES (DECK A))			
S622	1-762-875-21	SWITCH, KEYBOARD (MENU/NO (DECK A))			
S623	1-762-875-21	SWITCH, KEYBOARD (EJECT ⏏ (DECK A))			
S624	1-762-875-21	SWITCH, KEYBOARD (I/⏻)			
S625	1-762-875-21	SWITCH, KEYBOARD (OUTPUT)			
S631	1-762-875-21	SWITCH, KEYBOARD (■ (DECK A))			
S632	1-762-875-21	SWITCH, KEYBOARD (❚❚ (DECK A))			
S633	1-762-875-21	SWITCH, KEYBOARD (▷ (DECK A))			

Ref. No.	Part No.	Description				Remark
S634	1-762-875-21	SWITCH, KEYBOARD (◀◀ (DECK A))				
S635	1-762-875-21	SWITCH, KEYBOARD (▶▶ (DECK A))				
S636	1-762-875-21	SWITCH, KEYBOARD (REC ● (DECK A))				
S644	1-762-875-21	SWITCH, KEYBOARD (CLEAR (DECK A))				
**********						
*	A-4724-104-A	KEY-B BOARD, COMPLETE				
		**********				
		< CONNECTOR >				
CN671	1-779-277-11	CONNECTOR, FFC(LIF(NON-ZIF))9P				
CN672	1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P				
		< ENCODER >				
JOG675	1-475-543-11	ENCODER, ROTARY (⏮ AMS ⏭ PUSH ENTER (DECK B))				
		< TRANSISTOR >				
Q681	8-729-900-80	TRANSISTOR DTC114ES				
Q691	8-729-900-80	TRANSISTOR DTC114ES				
		< RESISTOR >				
R651	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R652	1-247-843-11	CARBON	3.3K	5%	1/4W	
R653	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R661	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R662	1-247-843-11	CARBON	3.3K	5%	1/4W	
R663	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R664	1-249-429-11	CARBON	10K	5%	1/4W	
R665	1-249-435-11	CARBON	33K	5%	1/4W	
R673	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R674	1-249-429-11	CARBON	10K	5%	1/4W	
		< SWITCH >				
S651	1-762-875-21	SWITCH, KEYBOARD (MENU/NO (DECK B))				
S652	1-762-875-21	SWITCH, KEYBOARD (YES (DECK B))				
S653	1-762-875-21	SWITCH, KEYBOARD (EJECT ⏏ (DECK B))				
S661	1-762-875-21	SWITCH, KEYBOARD (■ (DECK B))				
S662	1-762-875-21	SWITCH, KEYBOARD (❚❚ (DECK B))				
S663	1-762-875-21	SWITCH, KEYBOARD (▷ (DECK B))				
S664	1-762-875-21	SWITCH, KEYBOARD (◀◀ (DECK B))				
S665	1-762-875-21	SWITCH, KEYBOARD (▶▶ (DECK B))				
S666	1-762-875-21	SWITCH, KEYBOARD (REC ● (DECK B))				
S674	1-762-875-21	SWITCH, KEYBOARD (CLEAR (DECK B))				
**********						
*	A-4724-119-A	MAIN BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C201	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	
C202	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	
C203	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C301	1-163-085-00	CERAMIC CHIP	2PF		50V	
C302	1-163-085-00	CERAMIC CHIP	2PF		50V	
C303	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V	
C304	1-163-038-91	CERAMIC CHIP	0.1uF		25V	

Ref. No.	Part No.	Description			Remark
C305	1-414-235-11	INDUCTOR CHIP	0uH		
C306	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C307	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C308	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C309	1-216-295-91	SHORT	0		
C310	1-126-204-11	ELECT CHIP	47uF	20%	16V
C311	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C312	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C313	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C315	1-126-204-11	ELECT CHIP	47uF	20%	16V
C316	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C317	1-126-204-11	ELECT CHIP	47uF	20%	16V
C318	1-119-765-11	ELECT	47uF	20%	6.3V
C321	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C322	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C323	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C324	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C325	1-126-204-11	ELECT CHIP	47uF	20%	16V
C326	1-126-204-11	ELECT CHIP	47uF	20%	16V
C327	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C330	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C331	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C332	1-126-204-11	ELECT CHIP	47uF	20%	16V
C333	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C335	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C336	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C337	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C338	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C339	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C340	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C341	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C342	1-126-204-11	ELECT CHIP	47uF	20%	16V
C343	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C344	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C345	1-126-204-11	ELECT CHIP	47uF	20%	16V
C349	1-126-204-11	ELECT CHIP	47uF	20%	16V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C352	1-126-204-11	ELECT CHIP	47uF	20%	16V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C354	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C355	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C356	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C357	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C358	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C359	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C360	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C361	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C362	1-126-204-11	ELECT CHIP	47uF	20%	16V
C363	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C364	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C365	1-126-204-11	ELECT CHIP	47uF	20%	16V
C369	1-126-204-11	ELECT CHIP	47uF	20%	16V
C372	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C443	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C444	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C445	1-163-038-91	CERAMIC CHIP	0.1uF		25V

MAIN

Ref. No.	Part No.	Description			Remark
C446	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C447	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C448	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C449	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C450	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C451	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C452	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C453	1-126-204-11	ELECT CHIP	47uF	20%	16V
C460	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C461	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C462	1-126-204-11	ELECT CHIP	47uF	20%	16V
C463	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C464	1-126-204-11	ELECT CHIP	47uF	20%	16V
C465	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C466	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C467	1-126-204-11	ELECT CHIP	47uF	20%	16V
C468	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C469	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C470	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C471	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C475	1-126-204-11	ELECT CHIP	47uF	20%	16V
C476	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C481	1-126-204-11	ELECT CHIP	47uF	20%	16V
C482	1-126-204-11	ELECT CHIP	47uF	20%	16V
C491	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-126-204-11	ELECT CHIP	47uF	20%	16V
C513	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C514	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C515	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C516	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C517	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C518	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C521	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C522	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C523	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C524	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C531	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C701	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C702	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C703	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C708	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C709	1-126-204-11	ELECT CHIP	47uF	20%	16V
C710	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C711	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C712	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C751	1-126-204-11	ELECT CHIP	47uF	20%	16V
C753	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C754	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C771	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C773	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C774	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C801	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C802	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C803	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C804	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C805	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C806	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C807	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C808	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C809	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C810	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C811	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C813	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C814	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C815	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C816	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C817	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C818	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C819	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C820	1-126-204-11	ELECT CHIP	47uF	20%	16V
C821	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C822	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C831	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C841	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C851	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C861	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C872	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C873	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C891	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C901	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C902	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C903	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C904	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C909	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C910	1-126-204-11	ELECT CHIP	47uF	20%	16V
C911	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C912	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C951	1-126-204-11	ELECT CHIP	47uF	20%	16V
C953	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C954	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C971	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C973	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C974	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C991	1-163-038-91	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

	CN301	1-784-391-11	CONNECTOR (FFC/FPC) 35P
	CN302	1-778-998-21	PIN, CONNECTOR (PC BOARD) 3P
*	CN401	1-770-153-11	PIN, CONNECTOR (PC BOARD) 8P
*	CN402	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P
	CN403	1-770-153-11	PIN, CONNECTOR (PC BOARD) 8P
	CN711	1-784-380-11	CONNECTOR (FFC/FPC) 23P
	CN721	1-784-384-11	CONNECTOR (FFC/FPC) 27P
	CN741	1-770-215-11	PIN, CONNECTOR (PC BOARD) 7P
	CN811	1-784-379-11	CONNECTOR (FFC/FPC) 22P
	CN821	1-784-376-11	CONNECTOR (FFC/FPC) 17P
	CN911	1-784-380-11	CONNECTOR (FFC/FPC) 23P
	CN921	1-784-384-11	CONNECTOR (FFC/FPC) 27P
	CN941	1-770-215-11	PIN, CONNECTOR (PC BOARD) 7P

< DIODE >

D441	8-719-800-76	DIODE 1SS226
D442	8-719-800-76	DIODE 1SS226
D443	8-719-800-76	DIODE 1SS226
D444	8-719-800-76	DIODE 1SS226

Ref. No.	Part No.	Description	Remark
D801	8-719-016-74	DIODE 1SS352	
D802	8-719-016-74	DIODE 1SS352	
D871	8-719-016-74	DIODE 1SS352	
D872	8-719-016-74	DIODE 1SS352	
		< IC >	
IC301	8-759-050-83	IC SN74HCU04APW-E20	
IC306	8-759-049-98	IC SN74HC74APW-E05	
IC311	8-759-050-06	IC SN74HC157APW-E05	
IC316	8-759-050-06	IC SN74HC157APW-E05	
IC321	8-759-238-47	IC TC74HCT7007AF(EL)	
IC331	8-759-455-21	IC AK4321-VF-E2	
IC351	8-759-455-21	IC AK4321-VF-E2	
IC441	8-759-636-55	IC M5218AFP	
IC442	8-759-636-55	IC M5218AFP	
IC461	8-759-462-08	IC AK5352-VF-E2	
IC471	8-759-481-73	IC SN74LVC125APW-E20	
IC491	8-759-083-94	IC TC7W74FU	
IC511	8-759-050-05	IC SN74HC153APW-E20	
IC516	8-759-050-05	IC SN74HC153APW-E20	
IC521	8-759-050-06	IC SN74HC157APW-E05	
IC531	8-759-083-94	IC TC7W74FU	
IC701	8-759-533-62	IC M30610MCA-254FP	
IC751	8-759-481-19	IC LB1830M-S-TE-L	
IC801	8-759-533-63	IC M30612MAA-202FP	
IC831	8-759-481-73	IC SN74LVC125APW-E20	
IC844	8-759-234-20	IC TC7S08F	
IC851	8-759-238-47	IC TC74HCT7007AF(EL)	
IC861	8-759-238-47	IC TC74HCT7007AF(EL)	
IC871	8-759-096-87	IC TC7WU04FU(TE12R)	
IC891	8-759-035-87	IC SC7S00F	
IC901	8-759-533-62	IC M30610MCA-254FP	
IC951	8-759-481-19	IC LB1830M-S-TE-L	
IC991	8-759-082-61	IC TC4W53FU	
		< COIL >	
L302	1-412-778-41	INDUCTOR 1.5uH	
L303	1-216-296-91	SHORT 0	
L304	1-414-235-11	INDUCTOR CHIP 0uH	
L305	1-414-235-11	INDUCTOR CHIP 0uH	
L306	1-412-778-41	INDUCTOR 1.5uH	
L307	1-216-296-91	SHORT 0	
L308	1-412-778-41	INDUCTOR 1.5uH	
L309	1-500-245-11	INDUCTOR CHIP 0uH	
L311	1-412-778-41	INDUCTOR 1.5uH	
L312	1-216-296-91	SHORT 0	
L461	1-216-296-91	SHORT 0	
L501	1-500-245-11	INDUCTOR CHIP 0uH	
L502	1-500-245-11	INDUCTOR CHIP 0uH	
L503	1-500-245-11	INDUCTOR CHIP 0uH	
L505	1-500-245-11	INDUCTOR CHIP 0uH	
L506	1-500-245-11	INDUCTOR CHIP 0uH	
L507	1-500-245-11	INDUCTOR CHIP 0uH	
L508	1-500-245-11	INDUCTOR CHIP 0uH	
L509	1-500-245-11	INDUCTOR CHIP 0uH	
L510	1-500-245-11	INDUCTOR CHIP 0uH	
L511	1-216-296-91	SHORT 0	
L513	1-500-245-11	INDUCTOR CHIP 0uH	
L520	1-500-245-11	INDUCTOR CHIP 0uH	
L522	1-500-245-11	INDUCTOR CHIP 0uH	
L524	1-500-245-11	INDUCTOR CHIP 0uH	
L526	1-500-245-11	INDUCTOR CHIP 0uH	
L528	1-500-245-11	INDUCTOR CHIP 0uH	
L529	1-500-245-11	INDUCTOR CHIP 0uH	
L530	1-500-245-11	INDUCTOR CHIP 0uH	
L531	1-500-245-11	INDUCTOR CHIP 0uH	
L532	1-500-245-11	INDUCTOR CHIP 0uH	
L533	1-500-245-11	INDUCTOR CHIP 0uH	
L535	1-500-245-11	INDUCTOR CHIP 0uH	
L611	1-500-245-11	INDUCTOR CHIP 0uH	
L721	1-216-295-91	SHORT 0	
L811	1-500-245-11	INDUCTOR CHIP 0uH	
L812	1-500-245-11	INDUCTOR CHIP 0uH	
L813	1-500-245-11	INDUCTOR CHIP 0uH	
L814	1-500-245-11	INDUCTOR CHIP 0uH	
L815	1-500-245-11	INDUCTOR CHIP 0uH	
L816	1-500-245-11	INDUCTOR CHIP 0uH	
L921	1-216-295-91	SHORT 0	
		< TRANSISTOR >	
Q461	8-729-421-22	TRANSISTOR UN2211	
Q751	8-729-421-22	TRANSISTOR UN2211	
Q851	8-729-421-22	TRANSISTOR UN2211	
Q951	8-729-421-22	TRANSISTOR UN2211	
		< RESISTOR >	
R301	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R302	1-216-295-91	SHORT 0	
R303	1-216-045-91	RES,CHIP 680 5% 1/10W	
R304	1-216-025-91	RES,CHIP 100 5% 1/10W	
R305	1-216-043-91	RES,CHIP 560 5% 1/10W	
R306	1-216-025-91	RES,CHIP 100 5% 1/10W	
R307	1-216-025-91	RES,CHIP 100 5% 1/10W	
R309	1-216-295-91	SHORT 0	
R311	1-216-025-91	RES,CHIP 100 5% 1/10W	
R312	1-216-025-91	RES,CHIP 100 5% 1/10W	
R314	1-216-295-91	SHORT 0	
R333	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R340	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R341	1-216-001-00	METAL CHIP 10 5% 1/10W	
R353	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R360	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R361	1-216-001-00	METAL CHIP 10 5% 1/10W	
R441	1-216-675-11	METAL CHIP 10K 0.5% 1/10W	
R442	1-216-675-11	METAL CHIP 10K 0.5% 1/10W	
R443	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R444	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R445	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R446	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R447	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R448	1-216-667-11	METAL CHIP 4.7K 0.5% 1/10W	
R449	1-216-639-11	METAL CHIP 330 0.5% 1/10W	
R450	1-216-639-11	METAL CHIP 330 0.5% 1/10W	
R451	1-216-639-11	METAL CHIP 330 0.5% 1/10W	
R452	1-216-639-11	METAL CHIP 330 0.5% 1/10W	

MAIN

Ref. No.	Part No.	Description			Remark
R453	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R454	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R455	1-216-295-91	SHORT	0		
R456	1-216-295-91	SHORT	0		
R462	1-216-001-00	METAL CHIP	10	5%	1/10W
R463	1-216-073-00	METAL CHIP	10K	5%	1/10W
R472	1-216-049-91	RES,CHIP	1K	5%	1/10W
R473	1-216-295-91	SHORT	0		
R474	1-216-295-91	SHORT	0		
R512	1-216-025-91	RES,CHIP	100	5%	1/10W
R516	1-216-025-91	RES,CHIP	100	5%	1/10W
R521	1-216-025-91	RES,CHIP	100	5%	1/10W
R706	1-216-073-00	METAL CHIP	10K	5%	1/10W
R707	1-216-073-00	METAL CHIP	10K	5%	1/10W
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W
R709	1-216-073-00	METAL CHIP	10K	5%	1/10W
R710	1-216-073-00	METAL CHIP	10K	5%	1/10W
R711	1-216-073-00	METAL CHIP	10K	5%	1/10W
R712	1-216-073-00	METAL CHIP	10K	5%	1/10W
R714	1-216-073-00	METAL CHIP	10K	5%	1/10W
R721	1-216-073-00	METAL CHIP	10K	5%	1/10W
R722	1-216-073-00	METAL CHIP	10K	5%	1/10W
R724	1-216-073-00	METAL CHIP	10K	5%	1/10W
R725	1-216-073-00	METAL CHIP	10K	5%	1/10W
R726	1-216-073-00	METAL CHIP	10K	5%	1/10W
R727	1-216-073-00	METAL CHIP	10K	5%	1/10W
R728	1-216-073-00	METAL CHIP	10K	5%	1/10W
R729	1-216-073-00	METAL CHIP	10K	5%	1/10W
R730	1-216-073-00	METAL CHIP	10K	5%	1/10W
R731	1-216-073-00	METAL CHIP	10K	5%	1/10W
R732	1-216-073-00	METAL CHIP	10K	5%	1/10W
R734	1-216-073-00	METAL CHIP	10K	5%	1/10W
R736	1-216-073-00	METAL CHIP	10K	5%	1/10W
R737	1-216-073-00	METAL CHIP	10K	5%	1/10W
R738	1-216-073-00	METAL CHIP	10K	5%	1/10W
R740	1-216-073-00	METAL CHIP	10K	5%	1/10W
R741	1-216-073-00	METAL CHIP	10K	5%	1/10W
R742	1-216-073-00	METAL CHIP	10K	5%	1/10W
R743	1-216-073-00	METAL CHIP	10K	5%	1/10W
R744	1-216-073-00	METAL CHIP	10K	5%	1/10W
R759	1-216-073-00	METAL CHIP	10K	5%	1/10W
R760	1-216-073-00	METAL CHIP	10K	5%	1/10W
R761	1-216-073-00	METAL CHIP	10K	5%	1/10W
R762	1-216-073-00	METAL CHIP	10K	5%	1/10W
R766	1-216-073-00	METAL CHIP	10K	5%	1/10W
R768	1-216-073-00	METAL CHIP	10K	5%	1/10W
R769	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R770	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R771	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R772	1-216-049-91	RES,CHIP	1K	5%	1/10W
R773	1-216-049-91	RES,CHIP	1K	5%	1/10W
R806	1-216-073-00	METAL CHIP	10K	5%	1/10W
R807	1-216-073-00	METAL CHIP	10K	5%	1/10W
R808	1-216-073-00	METAL CHIP	10K	5%	1/10W
R809	1-216-073-00	METAL CHIP	10K	5%	1/10W
R812	1-216-073-00	METAL CHIP	10K	5%	1/10W
R813	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R814	1-216-073-00	METAL CHIP	10K	5%	1/10W
R815	1-216-073-00	METAL CHIP	10K	5%	1/10W
R816	1-216-073-00	METAL CHIP	10K	5%	1/10W
R817	1-216-073-00	METAL CHIP	10K	5%	1/10W
R818	1-216-073-00	METAL CHIP	10K	5%	1/10W
R819	1-216-073-00	METAL CHIP	10K	5%	1/10W
R820	1-216-073-00	METAL CHIP	10K	5%	1/10W
R821	1-216-073-00	METAL CHIP	10K	5%	1/10W
R822	1-216-097-91	RES,CHIP	100K	5%	1/10W
R823	1-216-097-91	RES,CHIP	100K	5%	1/10W
R824	1-216-073-00	METAL CHIP	10K	5%	1/10W
R825	1-216-073-00	METAL CHIP	10K	5%	1/10W
R827	1-216-073-00	METAL CHIP	10K	5%	1/10W
R831	1-216-073-00	METAL CHIP	10K	5%	1/10W
R832	1-216-073-00	METAL CHIP	10K	5%	1/10W
R833	1-216-073-00	METAL CHIP	10K	5%	1/10W
R834	1-216-073-00	METAL CHIP	10K	5%	1/10W
R835	1-216-073-00	METAL CHIP	10K	5%	1/10W
R836	1-216-073-00	METAL CHIP	10K	5%	1/10W
R837	1-216-073-00	METAL CHIP	10K	5%	1/10W
R838	1-216-073-00	METAL CHIP	10K	5%	1/10W
R839	1-216-073-00	METAL CHIP	10K	5%	1/10W
R840	1-216-025-91	RES,CHIP	100	5%	1/10W
R843	1-216-049-91	RES,CHIP	1K	5%	1/10W
R844	1-216-049-91	RES,CHIP	1K	5%	1/10W
R845	1-216-049-91	RES,CHIP	1K	5%	1/10W
R846	1-216-049-91	RES,CHIP	1K	5%	1/10W
R851	1-216-073-00	METAL CHIP	10K	5%	1/10W
R852	1-216-073-00	METAL CHIP	10K	5%	1/10W
R855	1-216-073-00	METAL CHIP	10K	5%	1/10W
R867	1-216-025-91	RES,CHIP	100	5%	1/10W
R868	1-216-025-91	RES,CHIP	100	5%	1/10W
R869	1-216-025-91	RES,CHIP	100	5%	1/10W
R870	1-216-025-91	RES,CHIP	100	5%	1/10W
R871	1-216-089-91	RES,CHIP	47K	5%	1/10W
R872	1-216-109-00	METAL CHIP	330K	5%	1/10W
R873	1-216-049-91	RES,CHIP	1K	5%	1/10W
R874	1-216-073-00	METAL CHIP	10K	5%	1/10W
R880	1-216-025-91	RES,CHIP	100	5%	1/10W
R881	1-216-025-91	RES,CHIP	100	5%	1/10W
R882	1-216-025-91	RES,CHIP	100	5%	1/10W
R883	1-216-025-91	RES,CHIP	100	5%	1/10W
R884	1-216-025-91	RES,CHIP	100	5%	1/10W
R885	1-216-025-91	RES,CHIP	100	5%	1/10W
R886	1-216-049-91	RES,CHIP	1K	5%	1/10W
R887	1-216-049-91	RES,CHIP	1K	5%	1/10W
R888	1-216-073-00	METAL CHIP	10K	5%	1/10W
R889	1-216-073-00	METAL CHIP	10K	5%	1/10W
R910	1-216-073-00	METAL CHIP	10K	5%	1/10W
R911	1-216-073-00	METAL CHIP	10K	5%	1/10W
R912	1-216-073-00	METAL CHIP	10K	5%	1/10W
R918	1-216-073-00	METAL CHIP	10K	5%	1/10W
R922	1-216-073-00	METAL CHIP	10K	5%	1/10W
R924	1-216-073-00	METAL CHIP	10K	5%	1/10W
R925	1-216-073-00	METAL CHIP	10K	5%	1/10W
R926	1-216-073-00	METAL CHIP	10K	5%	1/10W
R927	1-216-073-00	METAL CHIP	10K	5%	1/10W
R928	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R929	1-216-073-00	METAL CHIP	10K	5%	1/10W
R930	1-216-073-00	METAL CHIP	10K	5%	1/10W
R931	1-216-073-00	METAL CHIP	10K	5%	1/10W
R936	1-216-073-00	METAL CHIP	10K	5%	1/10W
R937	1-216-073-00	METAL CHIP	10K	5%	1/10W
R938	1-216-073-00	METAL CHIP	10K	5%	1/10W
R942	1-216-073-00	METAL CHIP	10K	5%	1/10W
R944	1-216-073-00	METAL CHIP	10K	5%	1/10W
R957	1-216-073-00	METAL CHIP	10K	5%	1/10W
R958	1-216-073-00	METAL CHIP	10K	5%	1/10W
R965	1-216-073-00	METAL CHIP	10K	5%	1/10W
R970	1-216-073-00	METAL CHIP	10K	5%	1/10W
R972	1-216-073-00	METAL CHIP	10K	5%	1/10W
R973	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R974	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R975	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R976	1-216-049-91	RES,CHIP	1K	5%	1/10W
R977	1-216-049-91	RES,CHIP	1K	5%	1/10W
		< VIBRATOR >			
X301	1-767-913-11	VIBRATOR, CRYSTAL (45.1584MHz)			
X701	1-767-670-11	VIBRATOR, CERAMIC (7MHz)			
X801	1-760-928-21	VIBRATOR, CRYSTAL (32kHz)			
X802	1-767-670-11	VIBRATOR, CERAMIC (7MHz)			
X901	1-767-670-11	VIBRATOR, CERAMIC (7MHz)			
**********					
*	A-4724-115-A	POWER BOARD, COMPLETE			
		**********			
*	3-309-144-21	HEAT SINK			
*	4-363-146-71	HEAT SINK, V.OUT			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			
		< CAPACITOR >			
C100	1-115-364-11	ELECT	22000uF	20%	16V
C101	1-162-306-11	CERAMIC	0.01uF	20%	16V
C102	1-115-364-11	ELECT	22000uF	20%	16V
C103	1-126-965-11	ELECT	22uF	20%	50V
C104	1-126-009-81	ELECT	100uF	20%	16V
C105	1-162-306-11	CERAMIC	0.01uF	20%	16V
C106	1-126-933-11	ELECT	100uF	20%	16V
C107	1-162-306-11	CERAMIC	0.01uF	20%	16V
C108	1-126-964-11	ELECT	10uF	20%	50V
C110	1-126-963-11	ELECT	4.7uF	20%	50V
C111	1-528-887-11	BATTERY, LITHIUM SECONDARY			
C112	1-162-306-11	CERAMIC	0.01uF	20%	16V
C113	1-126-933-11	ELECT	100uF	20%	16V
C115	1-164-159-11	CERAMIC	0.1uF		50V
C119	1-126-933-11	ELECT	100uF	20%	16V
C120	1-164-159-11	CERAMIC	0.1uF		50V
C131	1-126-933-11	ELECT	100uF	20%	16V
C132	1-162-306-11	CERAMIC	0.01uF	20%	16V
C133	1-162-306-11	CERAMIC	0.01uF	20%	16V
C134	1-126-933-11	ELECT	100uF	20%	16V
C141	1-126-933-11	ELECT	100uF	20%	16V
C142	1-162-306-11	CERAMIC	0.01uF	20%	16V
C143	1-162-306-11	CERAMIC	0.01uF	20%	16V

Ref. No.	Part No.	Description			Remark
C144	1-126-933-11	ELECT	100uF	20%	16V
C151	1-126-933-11	ELECT	100uF	20%	16V
C152	1-162-306-11	CERAMIC	0.01uF	20%	16V
C153	1-162-306-11	CERAMIC	0.01uF	20%	16V
C154	1-126-933-11	ELECT	100uF	20%	16V
C161	1-126-016-11	ELECT	4700uF	20%	16V
C162	1-162-306-11	CERAMIC	0.01uF	20%	16V
C163	1-162-306-11	CERAMIC	0.01uF	20%	16V
C164	1-126-009-81	ELECT	100uF	20%	16V
C171	1-126-016-11	ELECT	4700uF	20%	16V
C172	1-162-306-11	CERAMIC	0.01uF	20%	16V
C173	1-162-306-11	CERAMIC	0.01uF	20%	16V
C174	1-126-009-81	ELECT	100uF	20%	16V
C191	1-126-933-11	ELECT	100uF	20%	16V
C192	1-162-306-11	CERAMIC	0.01uF	20%	16V
C193	1-162-306-11	CERAMIC	0.01uF	20%	16V
C194	1-126-933-11	ELECT	100uF	20%	16V
		< CONNECTOR >			
CN102	1-784-914-11	CONNECTOR (FFC) 35P			
* CN103	1-564-713-11	PIN, CONNECTOR (SMALL TYPE)11P			
* CN110	1-764-210-11	CONNECTOR, BOARD TO BOARD 12P			
		< DIODE >			
D101	8-719-070-51	DIODE 21DQ06-TA2B1			
D102	8-719-070-51	DIODE 21DQ06-TA2B1			
D103	8-719-070-51	DIODE 21DQ06-TA2B1			
D104	8-719-070-51	DIODE 21DQ06-TA2B1			
D105	8-719-911-19	DIODE 1SS119-25			
D106	8-719-911-19	DIODE 1SS119-25			
D107	8-719-043-76	DIODE AK04V0			
D108	8-719-043-76	DIODE AK04V0			
D109	8-719-911-19	DIODE 1SS119-25			
D110	8-719-911-19	DIODE 1SS119-25			
D111	8-719-200-82	DIODE 11ES2			
D112	8-719-200-82	DIODE 11ES2			
D113	8-719-931-86	DIODE HZS3.0NB2T2			
D114	8-719-911-19	DIODE 1SS119-25			
D131	8-719-911-19	DIODE 1SS119-25			
D141	8-719-911-19	DIODE 1SS119-25			
D151	8-719-911-19	DIODE 1SS119-25			
D161	8-719-200-82	DIODE 11ES2			
D162	8-719-200-82	DIODE 11ES2			
D165	8-719-911-19	DIODE 1SS119-25			
D171	8-719-200-82	DIODE 11ES2			
D172	8-719-200-82	DIODE 11ES2			
D175	8-719-911-19	DIODE 1SS119-25			
D191	8-719-911-19	DIODE 1SS119-25			
		< GROUND PLATE >			
* EP101	4-870-539-00	PLATE, GROUND			
		< IC >			
IC101	8-759-525-48	IC LA5632			
IC131	8-759-504-46	IC PQ05RF1			
IC141	8-759-504-46	IC PQ05RF1			
IC151	8-759-504-46	IC PQ05RF1			
IC161	8-759-604-99	IC M5F78M06L			

Ref. No.	Part No.	Description				Remark
IC171	8-759-604-94	IC M5F79M06L				
IC191	8-759-604-86	IC M5F7807L				
		< TRANSISTOR >				
Q103	8-729-422-57	TRANSISTOR UN4111				
Q104	8-729-281-53	TRANSISTOR 2SC1815-GR				
		< RESISTOR >				
R101	1-249-393-11	CARBON	10	5%	1/4W	F
R102	1-247-807-31	CARBON	100	5%	1/4W	
R103	1-249-424-11	CARBON	3.9K	5%	1/4W	F
R104	1-249-417-11	CARBON	1K	5%	1/4W	F
R105	1-249-393-11	CARBON	10	5%	1/4W	F
R107	1-249-403-11	CARBON	68	5%	1/4W	F
R108	1-249-412-11	CARBON	390	5%	1/4W	F
R109	1-247-836-11	CARBON	1.6K	5%	1/4W	
R110	1-249-416-11	CARBON	820	5%	1/4W	F
R111	1-249-429-11	CARBON	10K	5%	1/4W	
**********						
*	1-668-305-11	SEQ BOARD				
		*********				
		< DIODE >				
D681	8-719-301-72	DIODE SEL2810A-D-TP (RELAY)				
D691	8-719-301-72	DIODE SEL2810A-D-TP (MD SYNC)				
		< RESISTOR >				
R654	1-249-429-11	CARBON	10K	5%	1/4W	
R681	1-249-408-11	CARBON	180	5%	1/4W	F
R691	1-249-408-11	CARBON	180	5%	1/4W	F
		< SWITCH >				
S654	1-762-875-21	SWITCH, KEYBOARD (RELAY)				
S655	1-762-875-21	SWITCH, KEYBOARD (MD SYNC)				
**********						
*	1-668-111-11	SW BOARD				
		********				
		< CONNECTOR >				
CN601	1-506-486-11	PIN, CONNECTOR 7P				
		< SWITCH >				
S601	1-572-126-11	SWITCH, PUSH (1 KEY)(REC POSITION)				
S602	1-572-126-11	SWITCH, PUSH (1 KEY)(PACK OUT)				
S603	1-771-264-11	SWITCH, PUSH (CHUCKING IN)				
S604	1-771-264-11	SWITCH, PUSH (PB POSITION)				
**********						
*	1-668-298-11	TRANS BOARD				
		**********				
		< TRANSFORMER >				
⚠TR201	1-431-718-11	TRANSFORMER, POWER				
**********						

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
4	1-783-177-11	WIRE (FLAT TYPE) (27 CORE)	
5	1-783-176-11	WIRE (FLAT TYPE) (23 CORE)	
74	1-783-591-11	WIRE (FLAT TYPE) (11 CORE)	
75	1-783-592-11	WIRE (FLAT TYPE) (9 CORE)	
76	1-783-174-11	WIRE (FLAT TYPE) (22 CORE)	
77	1-783-175-11	WIRE (FLAT TYPE) (17 CORE)	
82	1-517-746-11	INDICATOR TUBE, FLUORESCENT	
⚠112	1-575-651-21	CORD, POWER	
113	1-783-173-11	WIRE (FLAT TYPE) (31 CORE)	
258	1-667-954-11	FLEXIBLE BOARD	
⚠260	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1N	
HR901	1-500-502-11	HEAD, OVER WRITE	
M101	A-4672-475-A	MOTOR ASSY, SPINDLE	
M102	A-4672-474-A	MOTOR ASSY, SLED	
M103	X-4949-264-1	MOTOR ASSY, LOADING	
S102	1-762-148-21	SWITCH, PUSH (REFLECT/PROTECT)	
⚠TR201	1-431-720-11	TRANSFORMER, POWER	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-475-591-11	REMOTE COMMANDER (RM-D21M)	
	1-558-271-11	CORD, CONNECTION (AUDIO,108cm)	
	1-690-863-11	CABLE, OPTICAL	
	3-862-570-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH,PORTUGUESE)	
	3-862-570-21	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH,ITALIAN)	
	4-983-537-01	COVER, BATTERY (FOR RM-D21M)	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#2	7-685-872-09	SCREW +BVTT 3X8 (S)	
#3	7-621-772-20	SCREW +B 2X5	
#4	7-621-772-40	SCREW +B 2X8	
#5	7-685-131-19	SCREW +BV (DIA. 2.6) (IT3B)	
#6	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	

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

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