

MDS-B1/B2P

SERVICE MANUAL



PHOTO: MDS-B1 model

*US Model
Canadian Model
AEP Model
UK Model*



Model Name Using Similar Mechanism		NEW
Mechanism Type	MDS-B1	MDM-1D
	MDS-B2P	MDM-1E
Base Unit Type	MDS-B1	MBU-1A
	MDS-B2P	MBU-1B
Optical Pickup Block Type		KMS-140B

SPECIFICATIONS

General

Power requirements	AC 120 V, 60 Hz (For the U.S.A. and Canada) AC 230 V to 240 V, 50/60 Hz (For Europe)
Power consumption	25 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	-20°C to +55°C (-4°F to 131°F), without moisture condensation
Dimensions (w/h/d)	About 142 × 132 × 375 mm (5 ⁵ / ₈ × 5 ¹ / ₄ × 14 ⁷ / ₈ inches)
Weight	About 5 kg (11 lb)

Laser characteristics

Laser:	Semiconductor laser
Wavelength:	780 - 790nm
Laser diode properties	Material: GaAlAs Emission duration: continuous Laser output: less than 44.6 μW (This output is the value measured at a distance of 200 mm from the lens surface on the optical pick-up block.)

Digital audio signal format

System	MiniDisc digital audio system
Disc	MiniDisc
Modulation format	EFM (Eight-to-Fourteen Modulation)
Digital audio channel	2 channels
Sampling frequency	44.1 kHz
Error correction	ACIRC (Advanced Cross Interleave Reed Solomon Code)
Rotation mode	CLV (about 400 to 900 r.p.m.)

Input/output connectors

Analog input (MDS-B1 model only)

Connector	XLR-3-31
Reference level	+4 dB (factory set)
Adjustable range	-12 dB to +8 dBs
Maximum level	+24 dB
Input impedance	Approx. 10 kilohms, balanced

—Continued on next page—

MD RECORDER/PLAYER
SONY®



Analog output

Connector	XLR-3-32
Reference level	+4 dB (load impedance 10 kilohms) (factory setting)
Adjustable range	-12 dB to +8 dBs (load impedance 10 kilohm) (factory setting)
Maximum level	+24 dB (load impedance 10 kilohms) (factory setting)
Output impedance	Approx. 250 ohms, balanced
Load impedance	More than 600 ohms

REMOTE (25P)

Connector	D-SUB 25-pins (female)
Format	Parallel
Input level	L: ground short (less than 100 ohms) H: open collector (high impedance)
Output level	L: less than 0.8 V (Imax.: 25 mA) H: open collector (Vmax.: 12 V)
+5 V output	Imax. 50 mA

Audio characteristics

Frequency response	20 Hz to 20 kHz, ± 0.5 dB
Signal-to-noise ratio	More than 83 dB (with A-weight filter, when playing back recordable disc) More than 95 dB (with A-weight filter, when playing back premastered disc)
Total harmonic distortion	Less than 0.095% (at reference level ¹⁾ , 1 kHz, when playing back recordable disc) Less than 0.06% (at reference level ¹⁾ , 1 kHz, when playing back premastered disc)
Wow and flutter	Below measurable limit ($\pm 0.001\%$, W. Peak)

Supplied accessories

Wired remote controller RM-C1 (1)	} MDS-B1 model only
Connecting cable (1)	
Sony SUM-3 (NS) batteries (3)	
AC power cord (1)	
Operation manual (1)	

Design and specifications are subject to change without notice.

¹⁾ The reference level is the level at -20 dB from the full bit on the peak level meter scale.

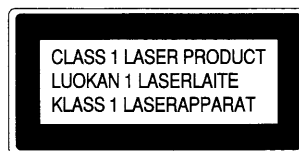
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SAFETY-RELATED COMPONENT WARNING!!

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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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



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

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

The mains switch is located on the front exterior.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

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

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

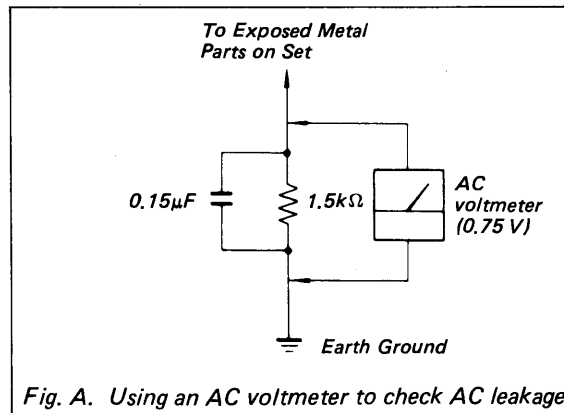


Fig. A. Using an AC voltmeter to check AC leakage.

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1-1 Introducing the MDS-B1

The MDS-B1 MD (MiniDisc) recorder provides the superior sound quality of digital MD recording and playback as well as MD recorder functions suited to the requirements of commercial broadcasting. The durability of MDs makes them ideal for playing repetitive material over long periods of time, such as background music or announcements at public facilities. The MDS-B1's analog input/output connectors allow signal transmissions over an XLR (balanced) cable. Its commercial broadcasting functions include highly accurate cuing, the indication of remaining play time, an EOM (end of message) indication, and an hours meter to indicate accumulated operating time for the laser diode and spindle motor. The MDS-B1 is compact enough to allow three units to be mounted in a standard 19" rack. It comes with a rear 25-pin REMOTE connector and a wire-connected remote controller that allows easy entry of titles and other text data on a standard typewriter keyboard.

1-2 Features

1-2-1 Features of the MiniDisc Recorder

ATRAC (Adaptive Transform Acoustic Coding) data compression technology

By eliminating inaudible sound data to obtain a compression ratio of 1:5, ATRAC data compression technology enables the recording of sound information of almost the same quality and quantity as a CD, but on a smaller disc.

74 minutes of playback or recording (Recording mode is the MDS-B1 model only)

A single MD can be used to play back or record up to 74 minutes of sound information, far exceeding the capacity possible with IC memories.

Direct track access

You can use the supplied remote controller to directly access any of 255 MD tracks, without the long cuing time required for tape.

Various playback functions

The MDS-B1's various playback functions include repeated playback of tracks and programmed playback of tracks.

Multiple editing functions (MDS-B1 model only)

The MDS-B1's editing functions allow you to divide, combine and move tracks, as well as monitor the sound while dividing tracks. Unlike tracks on analog cassette tape, specific MD tracks or an entire MD can be erased instantly.

Text entry (MDS-B1 model only)

You can use the supplied wire-connected remote controller to enter text to create titles for recorded discs and tracks. Titles, which may be as long as 100 characters per title and totaling 1,792 characters per disc, appear in the display window during playback.

1-2 Features

Durability

Because the MDs use a non-contact system like compact discs, they are superior to the cassette tape in durability.

1-2-2 Operational Features

AUTO PAUSE function

You can use the AUTO PAUSE function to place an MD in playback pause at the beginning of a track, then press the PLAY/PAUSE key to start playback. Use this function to pre-cue tracks during on-the-air broadcasting with multiple MD recorders.

AUTO CUE function

When the AUTO CUE function is on, the MD recorder enters playback pause when it detects a rise in the audio signal (above -58 dB) following the inaudible portion at the start of a track. This function is effective for delivering special sound effects in theater productions, etc.

Playback display variations

While entering a track title, you can use a semicolon to divide the title, then display each part separately during playback by pressing the DISPLAY key. By holding down the DISPLAY key, you can also display the remaining playing time of the track alternately with the track title or elapsed playing time (auto display function).

LevelSync setting function (MDS-B1 model only)

LevelSync setting is essentially the adding of track numbers at specified points while recording. Track numbers can be added automatically or manually.

End-of-message (EOM) indication

The display indication flashes when that the end of the track approaches (EOM indication). You can specify flashing to start at between 1 and 35 seconds before the end of the track.

Hours meter

The hours meter displays the accumulated time of laser diode recording operations and spindle motor operation. Use this information as the basis for replacing the BU block.

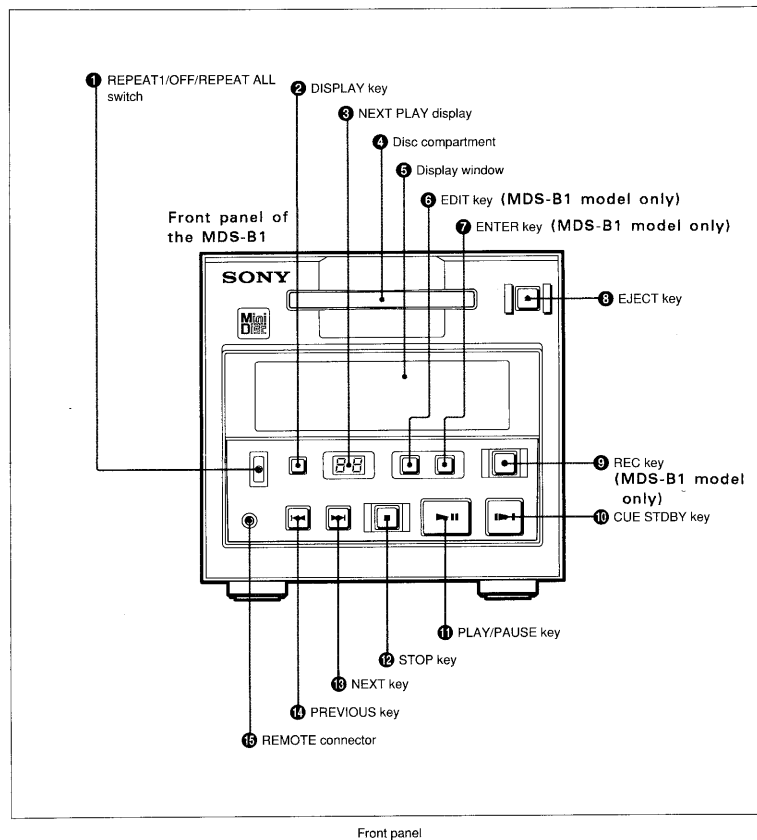
Remote control function

The MD recorder can be controlled by external control signals sent to the MDS-B1 through the REMOTE (25-pin) connector on the rear panel.

Rack mounting compatibility

Three MD recorders can be mounted side by side in a standard 19" EIA rack.

2-1 Front Panel



① REPEAT1/OFF/REPEAT ALL switch

Use to select repeated playback.

REPEAT1: The MD recorder plays back the current track repeatedly.

REPEAT ALL: The MD recorder plays back all tracks repeatedly and in sequential order.

OFF: The MD recorder plays back each track once.

② DISPLAY key

Press this key to display disc information. The following items appear in sequential order each time you press this key.

When the recorder is stopped: Disc title, total track number and total disc playing time, remaining recording time on disc. (In case of premastered discs: disc title, total track number and total disc playing time.)

During playback or playback pause: Track title, remaining playing time of current track, and elapsed playing time.

Hold down the key for three seconds while the track title is on and the remaining playing time will alternate with the track title in the display (auto display function).

During recording: Elapsed recording time of current track, remaining recording time on disc. Press the DISPLAY key together with the STOP key to activate the menu setting function.

③ NEXT PLAY display

Shows the next track number to be played after the current track. When the track number exceeds 99, "—" appears on the display.

④ Disc compartment

Automatically loads an inserted disc.

⑤ Display window

Indicates the current MD recorder operating status, such as disc title, track title, track number, and elapsed time.

⑥ EDIT key (MDS-B1 model only)

Press to select or cancel an editing function.

⑦ ENTER key (MDS-B1 model only)

Press to execute a specified editing function.

⑧ EJECT key

Press to eject the disc from the disc compartment. This key lights when no disc is loaded, and flashes during loading of a disc.

⑨ REC (recording) key (MDS-B1 model only)

Press once to pause recording, then press PLAY/PAUSE key to start recording. The REC key lights when recording is paused or proceeding.

⑩ CUE STDBY (standby) key

Press to return to the position where you last pressed the PLAY/PAUSE key. After finding the position, MD recorder enters playback pause. Use this key to check or return to a cuing position.

⑪ PLAY/PAUSE key

Press to start playback or recording. Press during playback to temporarily stop the MD recorder; press again to cancel pause. The PLAY/PAUSE key lights while the MD recorder is playing back or recording. It flashes while the MD recorder is in playback pause or recording pause.

⑫ STOP key

Press to stop playback or recording, or to cancel program play.

⑬ NEXT key

Press to cue to the beginning of the next track. Hold down this key during playback to scan forward while monitoring the sound.

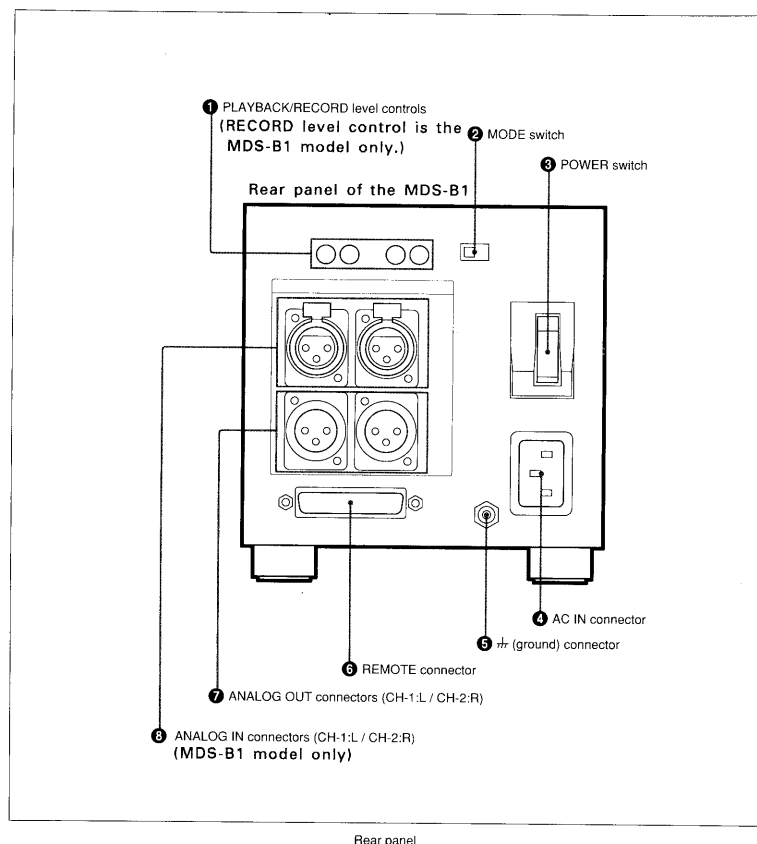
⑭ PREVIOUS key

Press to cue to the beginning of the previous track. Hold down this key during playback to scan backward while monitoring the sound.

⑮ REMOTE connector

Connect the supplied remote controller here.

2-2 Rear Panel



Rear panel

1 PLAYBACK/RECORD level controls (RECORD level control is the MDS-B1 model only.)

Adjust the analog input/output reference level during recording or playback by turning the control for each channel (CH-1:L/CH-2:R) with a bladed screwdriver.

2 MODE switch

Use to select monaural or stereo mode for the analog input/output signal.
When MONO is selected during playback, the signals of channel 1 and 2 are lowered to below -6 dB, then output from ANALOG OUT CH-1(L) and CH-2(R).
When MONO is selected during recording, the signal from ANALOG IN CH-1(L) and ANALOG IN CH-2(R) are lowered to below -6 dB, then recorded to channels 1 and 2.

Note

If a signal is recorded from only one ANALOG IN connector in MONO mode, the recording level will be -6 dB lower than that recorded in STEREO mode. In this case, use the PLAYBACK/RECORD level control to bring the recording level up to that of STEREO mode.

3 POWER switch

Press to turn on the MD recorder. Press again to turn the MD recorder off.

4 AC IN connector

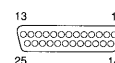
Connect to an AC outlet with the supplied AC power cord.

5 ⚡ (ground) connector

Connect directly to the ground.

6 REMOTE connector (D-sub 25-pin)

Connect to external equipment for remote control.



Pin assignment

Pin No.	Signal	Pin No.	Signal
1	GND (for status out)	14	CUE STDBY LED OUT
2	PLAY STATUS OUT	15	PAUSE STATUS OUT
3	EOM STATUS OUT	16	REC STATUS OUT
4	STOP STATUS OUT	17	PLAY/PAUSE LED OUT
5	EJECT LED OUT	18	5 V
6	NEXT COMMAND IN	19	Reserved
7	GND (for command IN)	20	PLAY COMMAND IN
8	Reserved	21	STOP COMMAND IN
9	EDIT COMMAND IN	22	DISPLAY COMMAND IN
10	ENTER COMMAND IN	23	REC COMMAND IN
11	KILL LOCAL COMMAND IN	24	CUE STDBY COMMAND IN
12	Reserved	25	PREVIOUS COMMAND IN
13	Reserved		

Caution

Do not set more than two COMMAND IN pins (pin numbers 6, 9, 10, 20, 21, 22, 23, 24, and 25) to LOW at the same time as this will cause the MD recorder to malfunction.

7 ANALOG OUT connectors (CH-1:L/CH-2:R, XLR 3-pin)

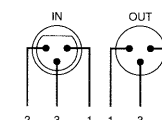
Output analog audio signals.

8 ANALOG IN connectors (CH-1:L/CH-2:R, XLR 3-pin) (MDS-B1 model only)

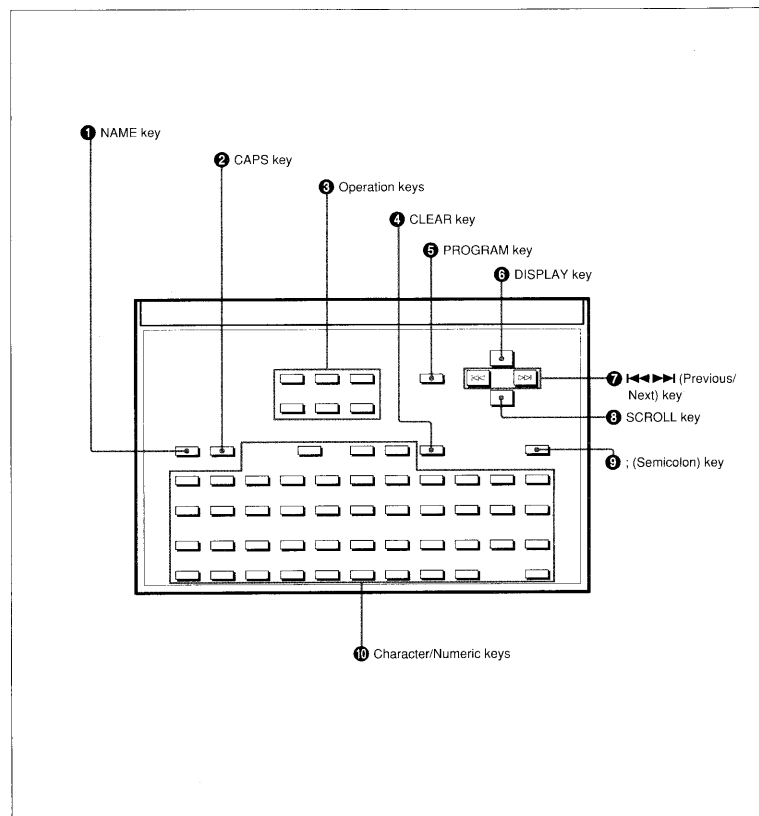
Input analog audio signals.

Pin assignment

Pin No.	Signal
1	GND
2	HOT
3	COLD



2-3 Remote Controller



Remote controller

1 NAME key

Press to activate the title function.

2 CAPS (capital letters) key

Press to enter uppercase letters.

3 Operation keys

Use the following keys to do the same operations as the respective keys on the MD recorder.

EDIT/NO key

Press to specify or cancel an editing function.

ENTER/YES key

Press to execute a specified editing function.

REC (recording) key

(Recording mode is the MDS-B1 model only.)

Press once to pause recording, then press the PLAY/PAUSE key to start recording.

STOP key

Press to stop playback or recording, or to cancel program play.

PLAY/PAUSE key

Press to start playback or recording. Press during playback to temporarily stop the MD recorder; press again to cancel pause.

CUE STDBY (standby) key

Press to return to the position where you last pressed the PLAY/PAUSE key. After finding the position, the MD recorder enters playback pause. Use this key to check or return to a cuing position.

4 CLEAR key

Press to erase an entered character or number.

5 PROGRAM key

Press to activate program play.

6 DISPLAY key

Press this key to display disc information. The following items appear in sequential order each time you press this key.

When the recorder is stopped: Disc title, total track number and total disc playing time, remaining recording time on disc. (In case of premastered discs: disc title, total track number and total disc playing time.)

During playback or playback pause: Track title, remaining playing time of current track, and elapsed playing time.

Hold down the key for three seconds while the track title or elapsed playing time is on and the display will alternate with the remaining playing time (auto display function).

During recording: Elapsed recording time of current track, remaining recording time on disc. Press the DISPLAY key together with the STOP key to activate the menu setting function.

7 <<<>>> (Previous/Next) key

Press the respective key to cue to the beginning of the previous or next track.

Hold down the key during playback to scan backward or forward with sound output.

8 SCROLL key

Press to scroll titles over 13 characters in length.

9 ; (Semicolon) key

Press while entering a title to divide the title into independently displayable parts.

10 Character/Numeric keys

Use the numeric keys to specify tracks for immediate playback or program play. Use the character keys to enter disc and track titles.

3-1 Precautions

3-1-1 Installation Precautions

Install the MD recorder on a flat surface in a temperature-controlled room. Avoid using or storing the MD recorder at a location that is:

- extremely hot or cold.
- damp.
- subject to severe vibrations.
- subject to strong magnetic fields.
- subject to many hours of direct sunlight or close to heating equipment.

3-1-2 Handling Precautions

- Check the MD recorder's operating voltage before you plug it in. It must be identical with that of your local power supply.
- If you drop any liquid or metal object inside the MD recorder, immediately stop using it, unplug the power cord from the socket, and contact Sony service personnel.
- If the MD recorder will be unused for a long time, make sure to unplug its power cord from the socket. When unplugging the power cord, grasp it by the plug, not the cord.
- Never remove the cabinet. The laser light used in the MD recorder can cause damage to your eyes. If the MD recorder needs to be inspected, contact Sony service personnel.

Condensation

Bringing in the MD recorder from a cold place or turning on the room heating may cause moisture to condense on the lens within the MD recorder, resulting in abnormal operation. If this occurs, leave the power on. The moisture will evaporate within an hour and the MD recorder will function normally again. If the MD recorder does not operate normally after a few hours, contact Sony service personnel.

If trouble occurs

Should you detect abnormal noise, smell, or smoke, immediately turn off the power, unplug the power cord from the socket, and contact Sony service personnel.

AC power cord

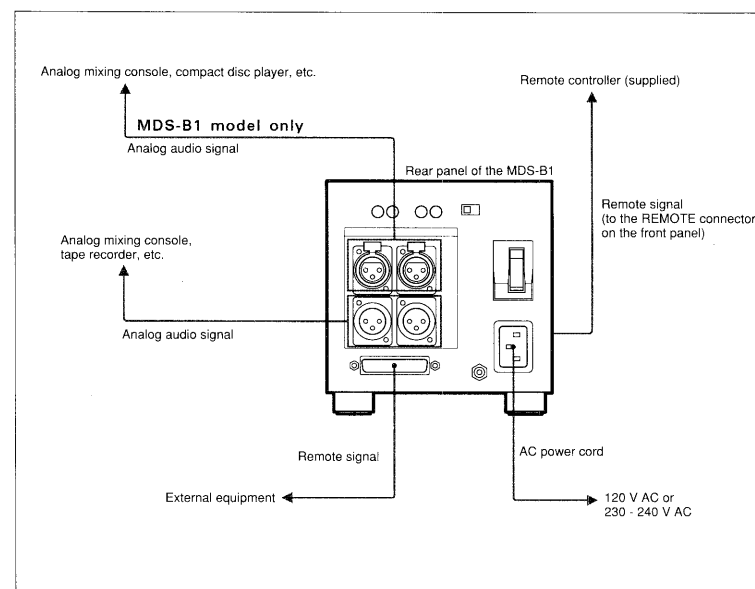
Do not use any power cord other than the one supplied with the MD recorder.

3-2 Connections

3-2-1 Precautions

- Turn off all equipment before connecting or disconnecting any cables.
- Insert all electrical plugs firmly since incomplete connections may cause noise.
- Use a cord somewhat longer than needed to prevent the plug from being pulled out when jarred or shaken.

3-2-2 Basic Connection Examples



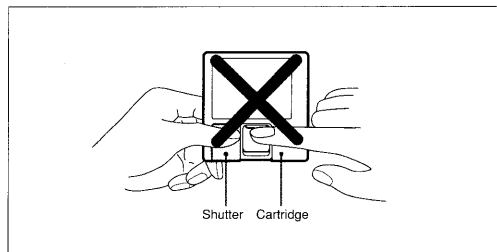
Basic connection examples

3-3 Handling MiniDiscs

Unlike CDs (Compact Discs), the MiniDisc is encased within a hard plastic cartridge which allows you to handle it without fear of dust or fingerprint contamination. However, a MiniDisc that has been contaminated or bent may cause the MD player to malfunction. To prevent damage to the contents of a disc and to enjoy clear sound permanently, take the following precautions when handling a MiniDisc:

Do not open the shutter to expose the disc

If you do so, the data on the disc may be damaged.



Handling MiniDiscs

Store MiniDiscs in a proper location

Do not place the cartridge where it will be subject to extremes of sunlight, temperature, moisture or dust.

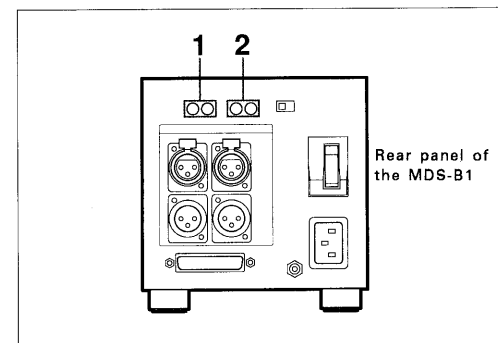
Cleaning the MiniDisc

Gently wipe the cartridge with a dry soft cloth to remove dust.

3-4 Setting the Analog Input/Output Reference Level

You can adjust the analog input/output reference level during recording or playback within a range of +8 dB to -12 dB by turning the PLAYBACK/RECORD level controls on the rear of the MD recorder. The analog input/output reference level is set at +4 dB at -20 dB from the full bit level at the factory.

Setting the analog input/output reference level



Setting the reference level

- 1 Playback a disc recorded at -20 dB from the full bit. Adjust the output level of the ANALOG OUT connectors with the PLAYBACK (CH-1/CH-2) controls.
- 2 Input an audio signal to the ANALOG IN connectors and adjust the recording level with the RECORD (CH-1/CH-2) controls.

Note

Adjust the PLAYBACK/RECORD level controls with a bladed screwdriver. Do not use excessive force when turning the screwdriver or touch the screwdriver to any part other than the PLAYBACK/RECORD level controls.

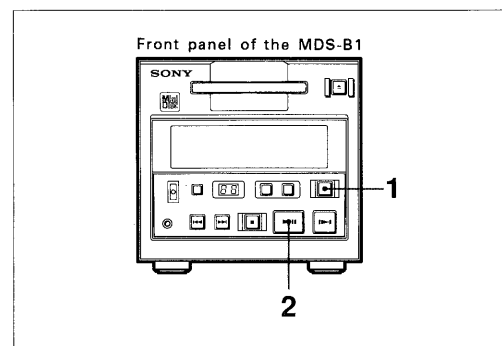
4-1 Recording Procedure

(MDS-B1 model only)

If the inserted disc already contains recorded material, the MD recorder will automatically record the new material at the end of the existing material with a new track number.

To adjust the recording level, see "3-4 Setting the Analog Input/Output Reference Level" on page 3-5.

To record track numbers automatically at points of low signal level, see "7-4 Recording a Track Number Automatically (LevelSync Setting)" on page 7-6.



Recording procedure

- 1** Press the REC key.
The MD recorder enters recording pause. (The REC key lights and the PLAY/PAUSE key flashes.)
- 2** Press the PLAY/PAUSE key.
Recording starts. (The REC and PLAY/PAUSE keys light.)
- 3** Play the sound source to be recorded.
The track number being recorded and elapsed recording time appear in the display.

To record a track number manually during recording

Press the REC key at the required point.

To stop recording

Press the STOP key.

To stop recording temporarily

Press the PLAY/PAUSE key.

To resume recording, press the PLAY/PAUSE key again.

To eject the disc

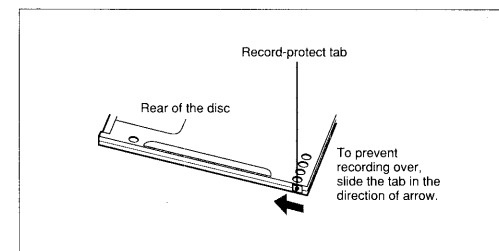
Press the STOP key to stop the MD, then press the EJECT key.

Note

If the MD recorder stays in recording pause for more than ten minutes, the MD recorder cancels recording pause, then stops.

Preventing accidental erasure

Slide the record-protect tab to open the slot. To allow recording again, slide the tab to close the slot.



To protect a MiniDisc against accidental erasure

The recording system in your MD recorder is radically different from those used in cassette and DAT decks and is characterized by the limitations described below.

"Disc Full" lights up even before the disc has reached the maximum recording time (60 or 74 minutes)

When 255 tracks have been recorded on the disc, "Disc Full" lights up regardless of the total recorded time. More than 255 tracks cannot be recorded on the disc.

"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.

The total recorded time and the remaining time on the disc may not equal 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.

"TOC Reading" indication appears for a long time

If the inserted recorded disc is brand new, the "TOC Reading" indication appears on the display longer than for those that have been used.

Playback of a track of under 4 seconds may be accompanied by sound dropout at the start of the next track or misoperation of the MD recorder.

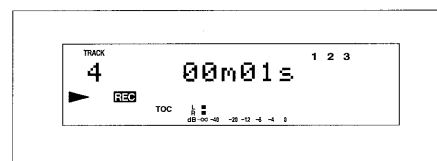
4-2 Display Information During Recording

(MDS-B1 model only)

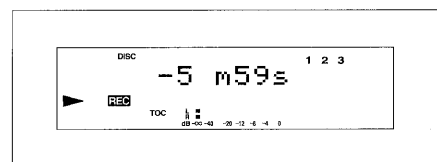
Changing the display information during recording

Each press of the DISPLAY key during recording changes the information on the display as follows:

- Recorded time of the current track



- Remaining recording time on disc



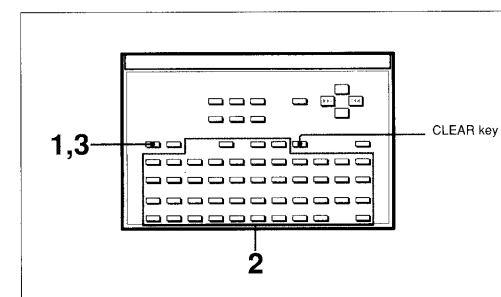
4-3 Adding Disc and Track Titles

(MDS-B1 model only)

Use the title function to add titles to your own discs and tracks with the character/numeric keys on the remote controller. The maximum length of a single title is 100 characters, and the maximum number of characters for all titles on a disc is 1,792. Newly added titles are temporarily stored in the recorder's memory (not saved to disc). To record the titles to the disc, press the STOP key or eject the disc before turning off the power. For more details, see "6-1 Overview of Editing Functions" on page 6-2.

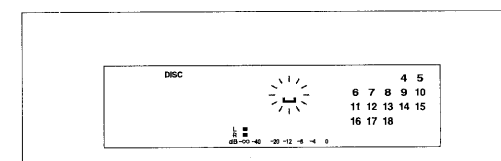
Adding a disc title

You can use this procedure while the MD recorder is stopped to add a title to the MiniDisc.



Adding a disc title

- 1 Insert the disc, then press the NAME key while the MD recorder is stopped. A flashing cursor appears in the display.



- 2 Type in a disc title with the character/numeric keys on the remote controller.
- 3 Press the NAME key. The disc title is entered.

4-3 Adding Disc and Track Titles

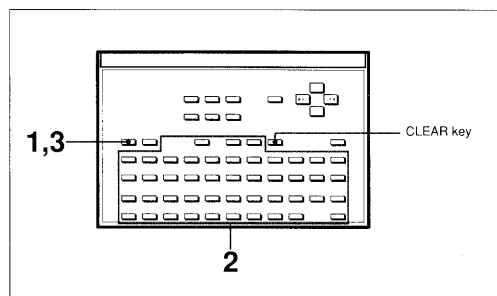
(MDS-B1 model only)

Making a correction

Press the CLEAR key to erase a typing error, then enter the correct character.

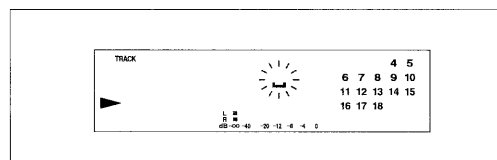
Adding a track title

Follow the procedure below to add a title to a track during playback, playback pause, or recording.



Adding a track title

- 1 Press the NAME key while playing, pausing or recording the track to be named.
A flashing cursor appears in the display.



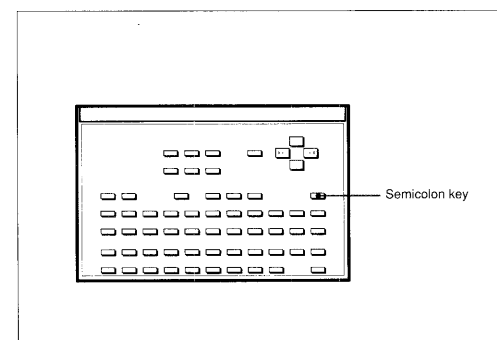
- 2 Type in the track title with the character/numeric keys on the remote controller.
- 3 Press the NAME key.
The track title is entered.

Making a correction

Press the CLEAR key to erase a typing error, then enter the correct character.

Dividing a track title into separate parts

When you add a track title, you can divide it by using semicolons, then display each part independently by pressing the DISPLAY key during playback of the track.



Dividing a track title into separate parts

Note

If "Protected" appears in the display

The record-protection slot on the disc is open and titles cannot be written to the disc. To add titles to the disc, eject the disc and close the slot.

5-1 Overview of MDS-B1 Playback Functions

The MDS-B1's many playback functions can be used in a variety of ways in broadcasting. This section gives an overview of these functions and their application.

AUTO PAUSE and AUTO CUE functions

AUTO PAUSE function

When AUTO PAUSE is on, the MD recorder pauses after locating the track.

How to activate it: Specify by menu.

For details, see page 7-4.

Purpose: Prevents on-the-air mistakes by pausing the MD recorder right before the start of play. When AUTO PAUSE is off, the MD recorder starts playing back immediately after locating the track.

AUTO CUE function

When the AUTO CUE function is on, the MD recorder changes to playback pause when it detects a rise in audio signal during a silent portion (–58 dB or less).

How to activate it: Specify by menu.

For details, see page 7-4.

Purpose: For precise cueing to play back sounds instantly.

When the MD recorder reaches a track with no sound while AUTO CUE is on

During one-track repeat play: The MD recorder pauses at the beginning of the track.

During all-tracks repeat play or when the repeat play function is off: The MD recorder locates the point where the audio level rises at the beginning of the next track.

Relation between the track location operation and AUTO PAUSE/AUTO CUE function

The following table indicates the respective track location operation of the MD recorder in relation to AUTO PAUSE/AUTO CUE function.

When locating a specific track with the numeric keys

AUTO PAUSE and AUTO CUE off	Begins playback immediately after locating the specified track.
AUTO PAUSE on	Changes to playback pause after locating the beginning of the specified track.
AUTO CUE on	Changes to playback pause just as the audio level rises (above –58 dB) at the beginning of the located track.

When locating the beginning of a track by pressing the NEXT or PREVIOUS key (AMS)

AUTO PAUSE and AUTO CUE off	Displays the track number after locating the specified track, then stops.
AUTO PAUSE on	Changes to playback pause after locating the beginning of the specified track.
AUTO CUE on	Changes to playback pause just as the audio level rises (above –58 dB) at the beginning of the located track.

Repeat playback functions

Three types of repeat playback functions can be used.

One-track repeat playback

The MD recorder plays back a specific track repeatedly.

How to activate it: Set the REPEAT1/OFF/REPEAT ALL switch to REPEAT1.

Purpose: For repeated playback of the same material.

All-tracks repeat playback

The MD recorder plays back all tracks repeatedly and in sequential order.

How to activate it: Set the REPEAT1/OFF/REPEAT ALL switch to REPEAT ALL.

Purpose: For repeated playback of a recorded or edited disc with a particular track sequence.

Program repeat playback

The MD recorder plays back a program repeatedly.

How to activate it: Set the REPEAT1/OFF/REPEAT ALL switch to either REPEAT1 or REPEAT ALL, then press the PROGRAM key.

Purpose: For repeated playback of the programmed tracks.

5-1 Overview of MDS-B1 Playback Functions

The following table indicates the respective repeat play operation of the MD recorder in relation to AUTO PAUSE.

	During one-track repeat play	During all-tracks repeat play	When repeat play function is OFF
When AUTO PAUSE or AUTO CUE are on ^{a)}			
When AUTO PAUSE and AUTO CUE are off			

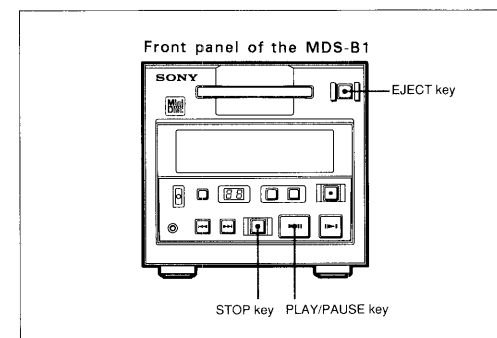
^{a)} When AUTO PAUSE is on, the MD recorder pauses after locating the track.
When AUTO CUE is on, the MD recorder pauses just as the audio level rises at the beginning of the located track.

Cue standby function

Pressing the CUE STDBY key causes the MD recorder to return to and enter playback pause at the last cueing position specified by pressing the PLAY/PAUSE key. Use this key to check or go to a previously set cueing position.
During program play, this function operates only within the currently playing track, and cannot be used to return to a cueing position within a previously played back.

5-2 Playback Procedure

5-2-1 Playing Back



Playing Back

Press the PLAY/PAUSE key.
When AUTO PAUSE and AUTO CUE are off:
The MD recorder starts playing. The current track title appears in the display.
When AUTO PAUSE is on:
The MD recorder enters playback pause at the beginning of the first track. The current track title appears in the display.
When AUTO CUE is on:
The MD recorder enters playback pause just as the audio level rises (above -58 dB) at the beginning of the first track. The current track title appears in the display.

To stop playback

Press the STOP key.

To stop playback temporarily

Press the PLAY/PAUSE key.
To restart playback, press the PLAY/PAUSE key again.

To eject the disc

Press the STOP key to stop playback, then press the EJECT key.

Your MiniDisc recorder is designed as a stereo system and cannot be used to play back monaural format MDs.

5-2-2 Locating a Specific Position (Search)

To find a specific position on the MD, use the NEXT and PREVIOUS keys during playback to quickly scan forward or backward.

To forward scan the disc

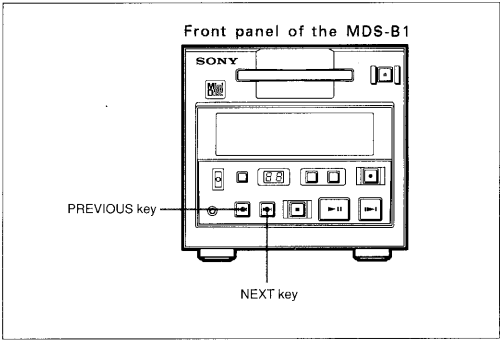
Hold down the NEXT key during playback. Releasing the key causes the MD recorder to play from the new location.

To backward scan the disc

Hold down the PREVIOUS key during playback. Releasing the key causes the MD recorder to play from the new location.

Note

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



Locating a specific position

5-3 Locating a Track

5-3-1 Locating a Specific Track

Access specific tracks instantly by entering their respective track numbers with the numeric keys on the remote controller. If AUTO PAUSE and AUTO CUE are off, the MD recorder begins playback immediately after locating the specified track. If AUTO PAUSE is on, the MD recorder changes to playback pause after locating the beginning of the specified track. If AUTO CUE is on, the MD recorder changes to playback pause just as the audio level rises (above -58 dB) at the beginning of the located track.

For details on the AUTO PAUSE and AUTO CUE functions, see "7-2 Setting the Timing of the EOM Indication" on page 7-3.

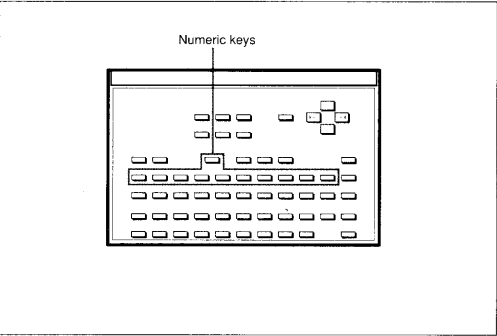
To specify track numbers greater than 10

Use the >10 key to specify the respective power of ten.

Example:

To locate the 15th track, press the >10 key once, then press 1 and 5.

To locate the 215th track, press the >10 key twice, then press 2, 1, and 5.



Locating a specific track

5-3 Locating a Track

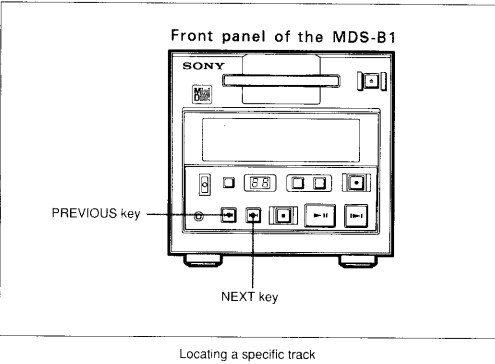
5-3-2 Locating the Beginning of a Track (AMS¹⁾)

When the MD recorder is stopped or in playback pause, you can quickly skip to any track number before or after the current one by pressing the NEXT or PREVIOUS key. (Holding down a key causes the track numbers to change quickly.)
If AUTO PAUSE and AUTO CUE are off, the MD recorder displays the track number after locating the specified track, then stops.
If AUTO PAUSE is on, the MD recorder changes to playback pause after locating the beginning of the specified track.
If AUTO CUE is on, the MD recorder changes to playback pause just as the audio level rises (above -58 dB) at the beginning of the located track.
For details on the AUTO PAUSE and AUTO CUE functions, see "7-2 Setting the Timing of the EOM Indication" on page 7-3.

To go to the beginning of a preceding track
Press the PREVIOUS key. Each press of the key decreases the track number by one.

To go to the beginning of a proceeding track
Press the NEXT key. Each press of the key increases the track number by one.

To go quickly to the last track on the disc
Press the PREVIOUS key after inserting the disc.



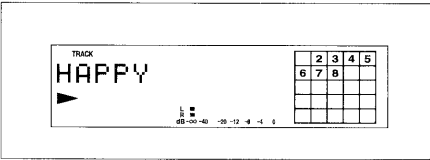
¹⁾ AMS is the abbreviation for Automatic Music Sensor.

5-4 Display Information During Playback

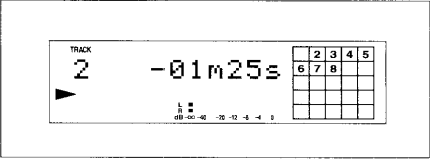
Changing the display information during playback

Each press of the DISPLAY key during playback or playback pause, changes the information on the display as follows:

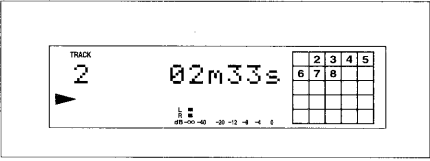
- Track title¹⁾



- Remaining playing time of the current track



- Elapsed playing time of the current track



¹⁾ If the track title has been divided into separate parts by semicolons, each part is displayed independently each time you press the DISPLAY key.
To divide a track title into separate parts, see "Dividing a track title into separate parts" on page 4-7.

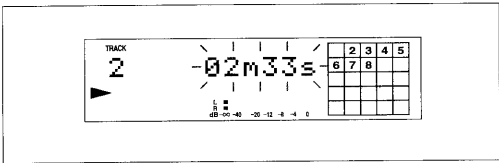
5-4 Display Information During Playback

Alternating display of title of current track and the remaining playing time (auto display function)

To cause the title of current track and remaining playing time to alternately appear on the display, hold down the DISPLAY key for about three seconds during playback, then release it.
Use this function when you want to check the remaining time and title of the current track during playback.
To cancel the alternating display, hold the DISPLAY key down for about three seconds again.

When an end of a track approaches

When the end of a track approaches, the indication in the display starts to flash (EOM indication).
To specify the timing of the indication, see "7-2 Setting the Timing of the EOM Indication" on page 7-3.



Display when the end of the track approaches

Note

If the EOM indication function activates while the auto display function is on, the track title stays on and begins to flash.

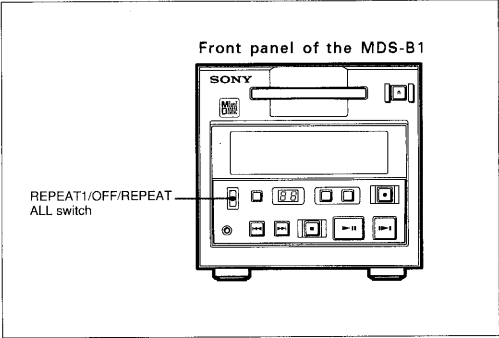
5-5 Playing Tracks Repeatedly

You can select the following repeat functions with the REPEAT1/OFF/REPEAT ALL switch.

REPEAT1: The MD recorder plays back the current track repeatedly.

OFF: The MD recorder plays back each track once.

REPEAT ALL: The MD recorder plays back all tracks repeatedly and in sequential order. During program play, the MD recorder plays back selected tracks in a programmed order repeatedly.

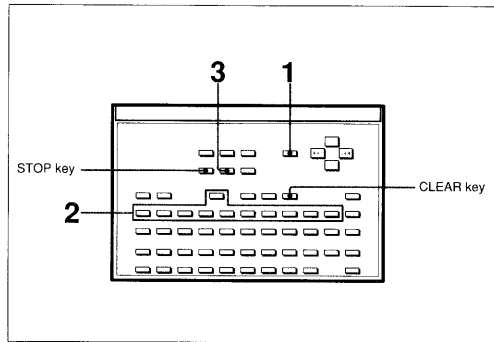


Playing tracks repeatedly

Once you have specified the repeat function during program play, you cannot use the REPEAT1 setting to playback repeatedly individual tracks within the program.

5-6 Playing Back a Program (Program Play)

Use the program play function to specify the playback sequence of multiple tracks.



Program play

- 1** Press the PROGRAM key of the remote controller while the MD is stopped.
The PROGRAM indicator turns on.
- 2** Enter the numbers of the tracks to be played in the order of their playback.
When you enter a track number, the display shows the track number and the order of the specified track, followed by the total program time.
- 3** Press the PLAY/PAUSE key.
When AUTO PAUSE and AUTO CUE are off:
Program play starts from the first track of the program.
When AUTO PAUSE is on:
The MD recorder enters playback pause at the beginning of the first track of the program.
When AUTO CUE is on:
The MD recorder enters playback pause just as the audio level rises (above -58 dB) at the beginning of the first track of the program.

To enter track numbers greater than 10

Press the >10 key to indicate the respective power of ten.

Example:

To enter the 15th track, press the >10 key once, then press 1 and 5.

To enter the 215th track, press the >10 key twice, then press 2, 1, and 5.

To erase tracks from a program

Press the CLEAR key. The displayed track number is erased from the program. To continue erasing tracks one at a time, press the CLEAR key repeatedly.

To erase an entire program

Press the STOP key.

To stop program play

Press the STOP key. Pressing the STOP key again erases the entire program.

To cancel program play

Press the PROGRAM key.
The PROGRAM indicator turns off.

6-1 Overview of Editing Functions

(MDS-B1 model only)

Purpose of editing functions

The MDS-B1 editing functions allow you to rearrange the contents of recorded MDs to make it easy to locate specific tracks during playback.

Front panel or remote controller operations

You can do MD editing on either the front panel on the MD recorder or the remote controller. Editing procedures are identical in both cases, except in the specification of tracks to be edited, which is done with the numeric keys on the remote controller and with the NEXT and PREVIOUS keys on the front panel.

Selecting the editing function

Select the editing function by pressing the EDIT/NO key. Each press of the key displays a different editing function as follows:

- Erase? — For erasing recorded tracks
- Divide? — For dividing recorded tracks
- Combine? — For combining recorded tracks
- Move? — For moving recorded tracks

Tips on editing

If an editing procedure increases or decreases the number of tracks on the MD, the MD recorder will automatically renumber the tracks on that MD. For example, if you erase the second track, the third track becomes track 2, and all proceeding track numbers decrease by one. Since track numbers may change several times during editing operations, you should check the name and contents of all tracks as you edit them.

STOP key function

If you make any changes to an MD using the editing functions, you must press the STOP key to record the changes in the table of contents (TOC) area of the disc before turning off the MD recorder. If you don't do this, the editing changes will not be saved and the original MD contents will be unchanged.

You can press the STOP key to record changes after each editing operation, or save all changes together by pressing STOP or EJECT key after the last editing operation.

6-2 Erasing Recordings (Erase Function)

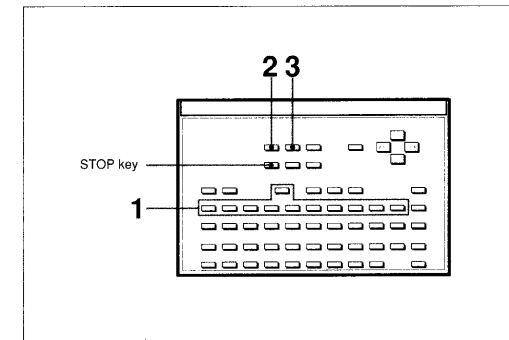
(MDS-B1 model only)

Use the erase function to erase a single track, successive tracks, or all tracks from a recorded disc.

After erasing a track, each track number following the erased track and the total number of tracks decrease by one.

Erasing a single track

You can erase a single track while the MD recorder is stopped, playing, or in playback pause status.



Erasing a single track

- 1** Enter the number of the track to be erased with the numeric keys (or the NEXT or PREVIOUS key on the front panel).
- 2** Press the EDIT/NO key until "Erase?" appears.
- 3** Press the ENTER/YES key. "Complete" appears for a few seconds, then disappears when the specified track has been erased.

To continue erasing tracks

Repeat steps 2 and 3 to erase more tracks.

To cancel the erase function

Press the EDIT/NO or STOP key to make "Erase?" disappear.

6-2 Erasing Recordings (Erase Function)

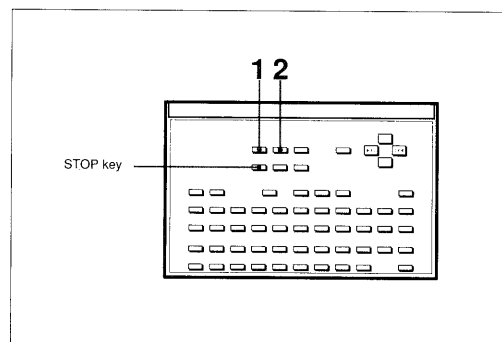
(MDS-B1 model only)

Notes

- If “Erase!!?” appears, it means that the track was recorded or edited on another MD recorder and is write-protected. To erase the track, press the ENTER/YES key while “Erase!!?” is displayed.
- If “Protected” appears, it means that the record-protect slot on the MD is open and the track cannot be erased. Eject the disc and close the slot, then reinsert the MD to erase the track.

Erasing all tracks on an MD

You can erase all tracks on an MD when the MD recorder is stopped.



Erasing all tracks

- 1 Hold down the EDIT/NO key for about a second until “All Erase?” appears.
- 2 Press the ENTER/YES key.
“Complete” appears for a few seconds, then disappears when all recorded tracks have been erased.

To cancel the Erase Function

Press the EDIT/NO or STOP key to make “All Erase?” disappear.

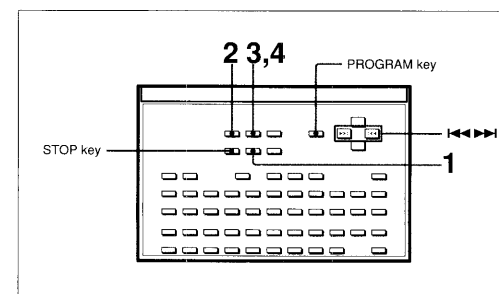
The remaining recording time does not increase even after erasing numerous short tracks

Tracks of under 8 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.

6-3 Dividing a Recorded Track (Divide Function)

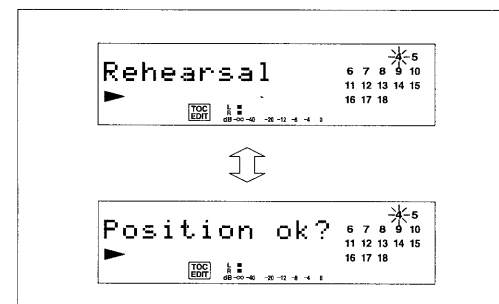
(MDS-B1 model only)

To randomly access certain portions of a track, the divide function allows you to create separate tracks for each portion. You can also use the divide function to erase selected portions of a track, by first specifying the portion as a separate track, then erasing that track (see “6-2 Erasing Recordings (Erase Function) on page 6-3). Do the divide function while playing the disc.



Dividing a recording track

- 1 While playing the track to be divided, press the PLAY/PAUSE key at the point where the new track is to begin.
The MD recorder changes to playback pause.
- 2 Press the EDIT/NO key until “Divide?” appears.
- 3 Press the ENTER/YES key.
“Rehearsal” and “Position ok?” alternately appear and the starting portion of the new track plays back repeatedly.



(Continued)

6-3 Dividing a Recorded Track (Divide Function)

(MDS-B1 model only)

- When you find the correct position, press the ENTER/YES key. "Complete" appears for a few seconds, then disappears when the track has been divided. The MD recorder then begins playing from the point of division.

If the starting position is incorrect

Press the EDIT/NO key, then, while monitoring the sound, press the **▶▶1** (Next) or **1◀◀** (Previous) key to change the starting position. You can move the starting position in steps of ± 0.06 seconds, up to -128 to $+127$ steps from the original position. "Rehearsal" and "Position ok?" alternately appear in the display while the starting position plays repeatedly.

To change the step interval

Press the PROGRAM key to select ± 1 for a step interval of ± 0.06 second, or ± 2 for a step interval of ± 0.12 second.

To cancel the divide function

Press the EDIT/NO or STOP key to make "Divide?" disappear.

Notes

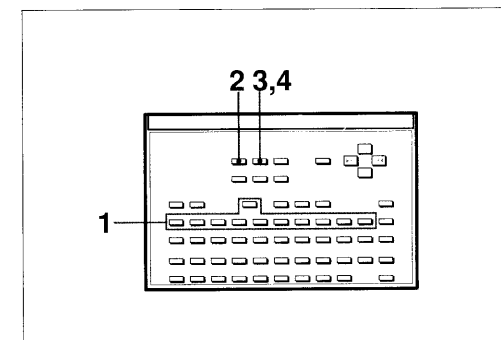
- A new track created by the divide function will have no title even if the original track has one.
To add a title to the new track, see "4-3 Adding Disc and Track Titles" on page 4-5.
- If "Protected" appears, it means that the record-protect slot is open and the track cannot be divided. Eject the disc and close the slot, then reinsert the MD and divide the track.
- Some tracks of under 8 seconds long may not be divided.

6-4 Combining Recorded Tracks (Combine Function)

(MDS-B1 model only)

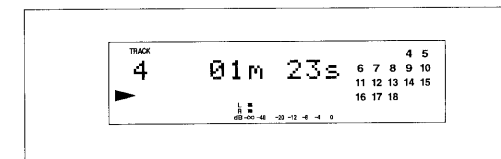
Use the combine function to combine consecutive tracks on a recorded disc.

You can combine tracks while the MD recorder is stopped, playing, or in playback pause status.



Combining recorded tracks

- Specify the second track of the two tracks to be combined with the numeric keys (or the NEXT and PREVIOUS keys on the front panel).
For example, enter 4 to combine tracks 3 and 4.



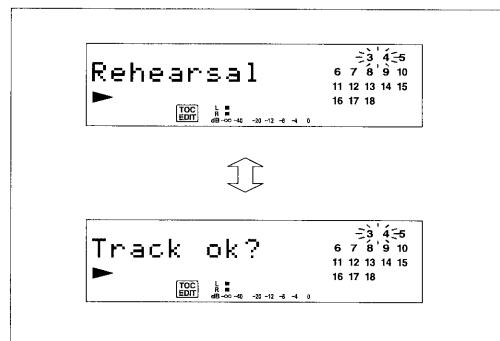
- Press the EDIT/NO key until "Combine?" appears.

(Continued)

6-4 Combining Recorded Tracks (Combine Function)

(MDS-B1 model only)

- 3 Press the ENTER/YES key.
“Rehearsal” and “Track ok?” appear alternately and the position where the two tracks are to be joined (i.e., the end of the first track and the beginning of the second track) plays back repeatedly.
If the position is incorrect, press the EDIT/NO key to cancel the combine function.
Repeat steps 1 to 3 until you find the correct position.



- 4 If the position is correct, press the ENTER/YES key.
“Complete” appears for a few seconds, then disappears when the tracks have been combined.

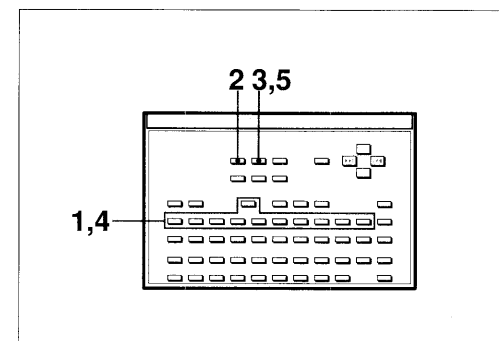
Notes

- If the “Sorry” appears, the specified tracks cannot be combined. Extensive editing of the same track may make it impossible to combine with another track. This is due to the technical limitation of the MD recorder and is not a mechanical error.
- If both tracks to be combined have track titles, the title of the second track is erased and title of the first track is used as the title of the combined track.
- If “Protected” appears, it means that the record-protect slot is open and the tracks cannot be combined. Eject the disc and close the slot, then reinsert the MD and combine the tracks.
- Some tracks of under 8 seconds long may not be combined.

6-5 Moving Recorded Tracks (Move Function)

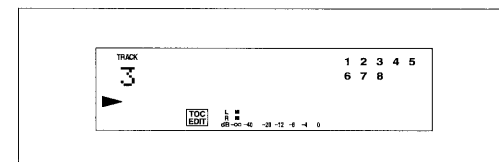
(MDS-B1 model only)

Use the move function to change the order of specific tracks. You can change the order of the tracks while the MD recorder is stopped, playing or in playback pause status.

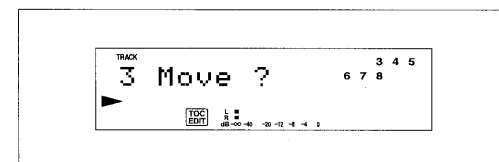


Moving recorded tracks

- 1 Specify the track to be moved with the numeric keys (or the NEXT and PREVIOUS keys on the front panel).
For example, enter 3 to move track 3.



- 2 Press the EDIT/NO key until “Move?” appears.

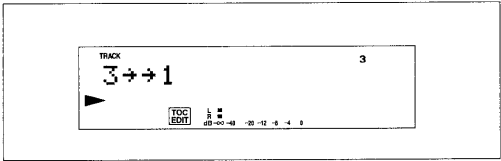


(Continued)

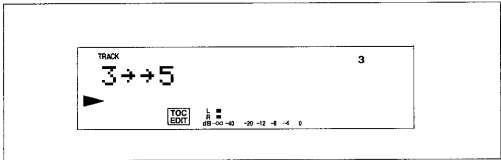
6-5 Moving Recorded Tracks (Move Function)

(MDS-B1 model only)

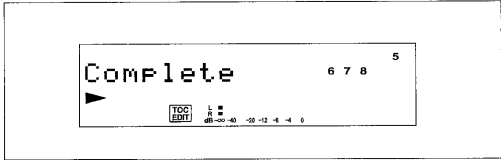
- 3 Press the ENTER/YES key.
The number of the track to be moved and the new track position appear.



- 4 Specify the new position of the specified track with the numeric keys (or the NEXT and PREVIOUS keys on the front panel).
For example, enter 5 to move track 3 to track position 5.

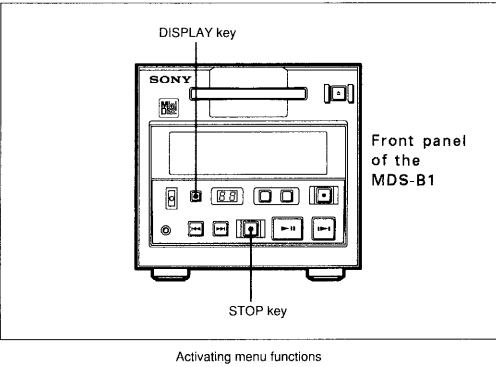


- 5 Press the ENTER/YES key.
"Complete" appears for a few seconds, then disappears when the track has been moved.



- Notes**
- If "Protected" appears, it means that the record-protect slot is open and the track cannot be moved. Eject the disc and close the slot, then reinsert the MD and move the track.
 - Some tracks of under 8 seconds long may not be moved.

7-1 Using the Menu Functions



Activating the menu

Press the STOP and DISPLAY keys on the front panel of the MD recorder simultaneously.

To select a menu function

Press the DISPLAY key. The menu function display changes as follows:

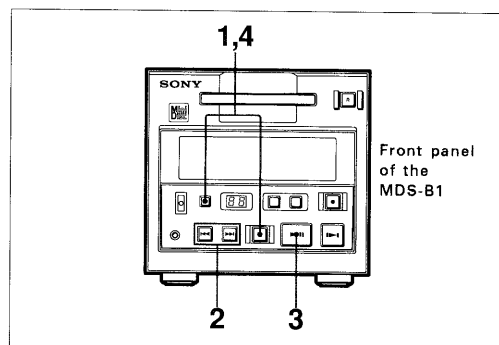
- Setting the timing of the end-of-message (EOM) indication
- Pausing before playback (AUTO PAUSE and AUTO CUE functions)
- Recording a track number automatically (LevelSync setting function)
- Displaying the hours meter

To cancel the menu

Press the STOP key.

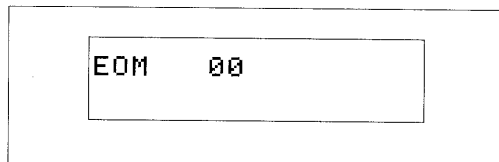
7-2 Setting the Timing of the EOM Indication

The EOM indication can be set to flash between 1 and 35 seconds before the end of a track to indicate that the end is approaching. Use the procedure below to set the timing.



Setting the timing of the end-of-message (EOM) indication

- 1 Press the STOP and DISPLAY keys simultaneously. The EOM (end-of-message) function goes on.



- 2 Press the NEXT or PREVIOUS key to select the timing.
- 3 Press the PLAY/PAUSE key to enter the EOM timing.
- 4 To continue with another menu function, press the DISPLAY key until the function appears. To cancel the menu, press the STOP key.

Chapter 7

Chapter 7

7-3 Pausing Before Playback (AUTO PAUSE and AUTO CUE Functions)

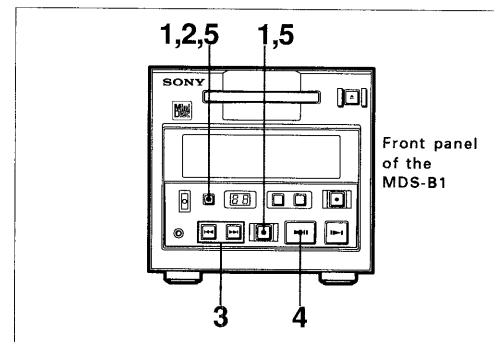
AUTO PAUSE function

When AUTO PAUSE is on, the MD recorder changes to playback pause at the start of the specified track, then starts playing the track when you press the PLAY/PAUSE key. The AUTO PAUSE function is useful for pre-cueing tracks on multiple MD recorders during on-the-air broadcasting.

AUTO CUE function

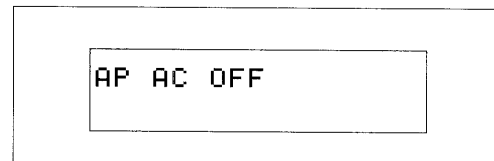
When AUTO CUE is on, the MD recorder changes to playback pause just as the audio level rises (above -58 dB) at the start of a track. You can then play the track by pressing the PLAY/PAUSE key. This function is useful for cueing to and delivering special sound effects during plays and other productions.

Activating the AUTO PAUSE/AUTO CUE functions

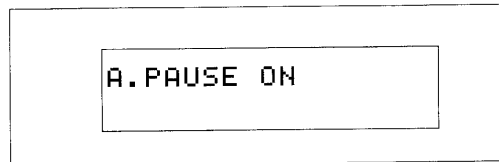


Activating the AUTO PAUSE/AUTO CUE functions

- 1 Press the STOP and DISPLAY keys simultaneously. A menu function appears.
- 2 Press the DISPLAY key until "AP AC OFF" appears.



- 3** Press the NEXT or PREVIOUS key to select the setting.
AP AC OFF: AUTO PAUSE and AUTO CUE are off.
A. PAUSE ON: AUTO PAUSE is on.
A. CUE ON: AUTO CUE is on.



- 4** Press the PLAY/PAUSE key to enter the selected setting.
- 5** To continue with another menu function, press the DISPLAY key until the function appears.
 To cancel the menu, press the STOP key.

Chapter 7

Chapter 7

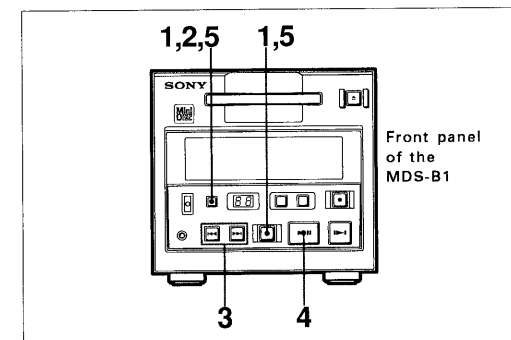
7-4 Recording a Track Number Automatically (LevelSync Setting)

(MDS-B1 model only)

LevelSync setting is essentially the adding of track numbers at specified points while you record. This allows you to quickly locate those points later either by directly specifying the track number or by using the AMS function.

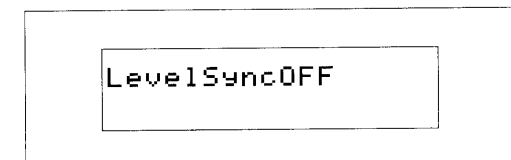
When track numbers are added automatically, the MD recorder system records track numbers whenever it detects a silent portion (i.e., the space between tracks). Manually you record track numbers by pressing the REC key during recording.

To add new track numbers to a track that has already been recorded, you must use the divide function to divide the track. See "6-3 Dividing a Recorded Track (Divide Function)" on page 6-5.



LevelSync setting function

- 1** Press the STOP and DISPLAY keys simultaneously.
 A menu function appears.
- 2** Press the DISPLAY key until "LevelSyncOFF" appears.



(MDS-B1 model only)

- 3 Press the NEXT or PREVIOUS key to select the setting.
ON: Track marks are automatically recorded by the MD recorder system when it detects a sudden rise in audio level after a silent portion (i.e., a signal level of less than -58 dB that continues for 1.6 seconds, then jumps to -58 dB or more). The rise is taken to be the start of a new track.
OFF: A track mark is recorded when you press the REC key during MD recording.
- 4 Press the PLAY/PAUSE key to enter the levelsync setting.
- 5 To continue with another menu function, press the DISPLAY key until the function appears.
 To cancel the menu, press the STOP key.

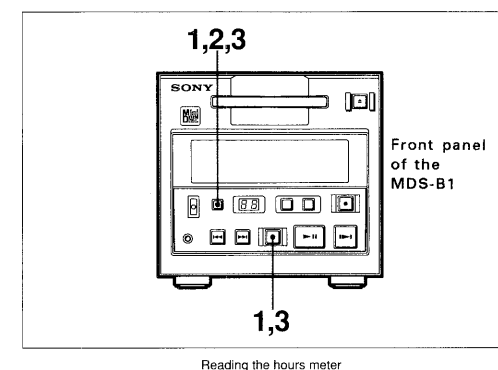
Chapter 7

Chapter 7

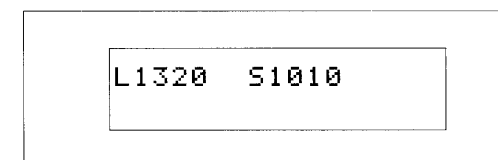
Track numbers are not recorded correctly
 Incorrect assignment or recording of track numbers may result when certain CDs are recorded with the "LevelSync ON" indication on.

7-5 Reading the Hours Meter

This function allows you to display the accumulated operating time of the laser diode (during recording operations) and of the spindle motor. Use this information as the basis for replacing the BU block.



- 1 Press the STOP and DISPLAY keys simultaneously.
A menu function appears.
- 2 Press the DISPLAY key until the hours meter showing the accumulated operating times appears.
L: Accumulated laser diode operating time.
S: Accumulated spindle motor operating time.



- 3 To continue with another menu function, press the DISPLAY key until the function appears.
 To cancel the menu, press the STOP key.

Note

When the BU block is replaced, a new EEP-ROM is installed and the hours meter is zeroed. Since this resets the other menu functions as well, you must make the applicable settings again.

8-1 Cleaning the MD Recorder

Use a soft cloth slightly moistened with a mild detergent solution to clean the cabinet and panel surface. Do not use solvents that may damage the surface such as paint thinner, benzine, or alcohol.

8-2 Display Messages

The following table explains in the various messages that appear in the display window.

Message	Meaning
Blank Disc	A new (blank) or erased disc has been inserted.
Cannot EDIT ✖	An attempt was made to edit the MD during program play, or the inserted disc contains Japanese ideograms.
Disc Error	The disc is abnormal (scratched or missing a TOC).
Disc Full ✖	The disc is full.
Impossible ✖	An attempt was made to combine tracks while playing back the first track.
Name Full ✖	The titling capacity of the disc has reached its limit (about 1,792 characters).
No Disc	There is no disc in the unit.
No Track	The inserted disc has a disc title but no tracks.
Protected	The inserted disc is record-protected.
Retry ✖	The first recording attempt failed due to a disturbance or scratch on the disc, and a second recording is being made.
Sorry ✖	An attempt was made to combine tracks that cannot be combined.
TOC Reform? ✖	The TOC has become almost full due to repeated editing operations. Press the ENTER/YES key to reform the TOC for a possible increase in recording time. Press the EDIT/NO key to bypass the reform process and turn off the message.

✖ mark is the MDS-B1 model only.

What is the MiniDisc?

How MiniDiscs Work

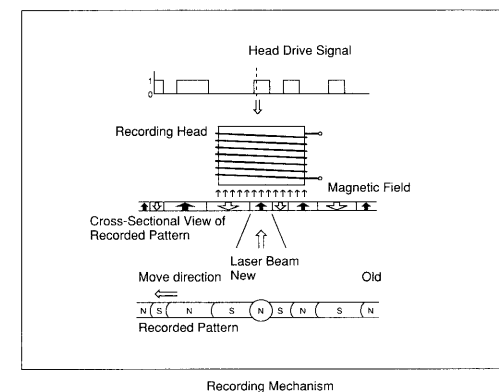
MiniDiscs (MD) come in two types: premastered (prerecorded) and recordable (blank). Premastered MDs, recorded at music studios, can be played back almost endlessly. However, they can't be recorded on or over like cassette tapes. To record, you use a "recordable MD".

Premastered MDs

Premastered MDs are recorded and played like regular CDs. A laser beam focuses on the pits in the surface of the MD and reflects the data back to the lens in the recorder. The recorder then decodes the signals and plays them back as music.

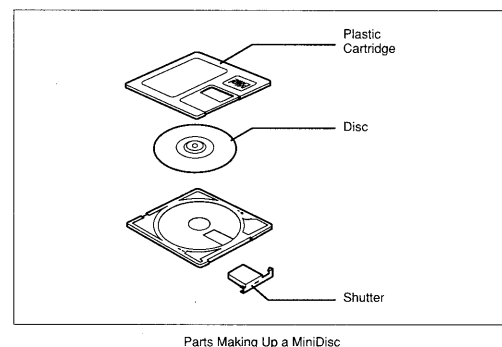
Recordable MDs

Recordable MDs, which use magneto-optical (MO) technology, can be recorded again and again. The laser inside the recorder applies heat to the MD, demagnetizing the magnetic layer of the MD. (See illustration below.) The recorder then applies a magnetic field to the layer. This magnetic field corresponds exactly to the audio signals generated by the connected source. (The north and south polarities equate to digital "1" and "0".) The demagnetized MD adopts the polarity of the magnetic field, resulting in a recorded MD.



How the MiniDisc Got So Small

The 2.5-inch MiniDisc, encased in a plastic cartridge that looks like a 3.5-inch diskette (see illustration below), uses a new digital audio compression technology called ATRAC (Adaptive TRAnsform Acoustic Coding). To store more sound in less space, ATRAC extracts and encodes only those frequency components actually audible to the human ear.



Parts Making Up a MiniDisc

How Quick Random Access and the TOC Systems Work

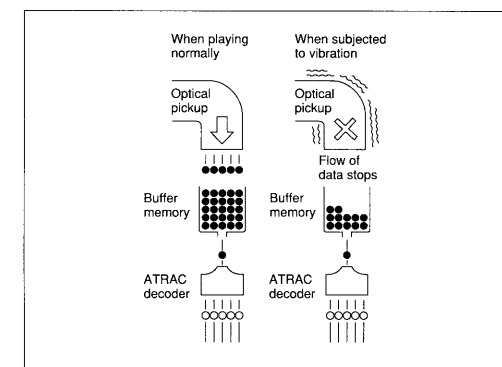
Like CDs, MDs offer instantaneous random access to the beginning of any music track. Premastered MDs are recorded with location addresses corresponding to each music selection. Recordable MDs are manufactured with a "User TOC¹⁾ Area" to contain the order of the music. The TOC system is similar to the "directory management system" of floppy disks. In other words, starting and ending addresses for all music tracks recorded on the disc are stored in this area. This lets you randomly access the beginning of any track as soon as you enter the track number (AMS), as well as label the location with a track name as you would a file on a diskette.

¹⁾ TOC is the acronym for Table of Contents.

What is the MiniDisc?

How the Shock-Resistant Memory Works

One major drawback of optical read systems is that they can skip or mute when subjected to vibration. The MD system resolves this problem by using a buffer memory that stores up to 10 seconds of audio data. This is possible because of a 1 second lag between the time audio data is picked up and when it is decoded (see illustration below). Should the optical pickup be jarred out of position, the correct audio data plays from the buffer memory. Using a concept called "sector repositioning," the optical pickup has the ability to within 13 milliseconds identify the disruption and resume reading from the correct point. As long as the optical pickup returns to the correct position within about 10 seconds, you never experience mistracking or muting.

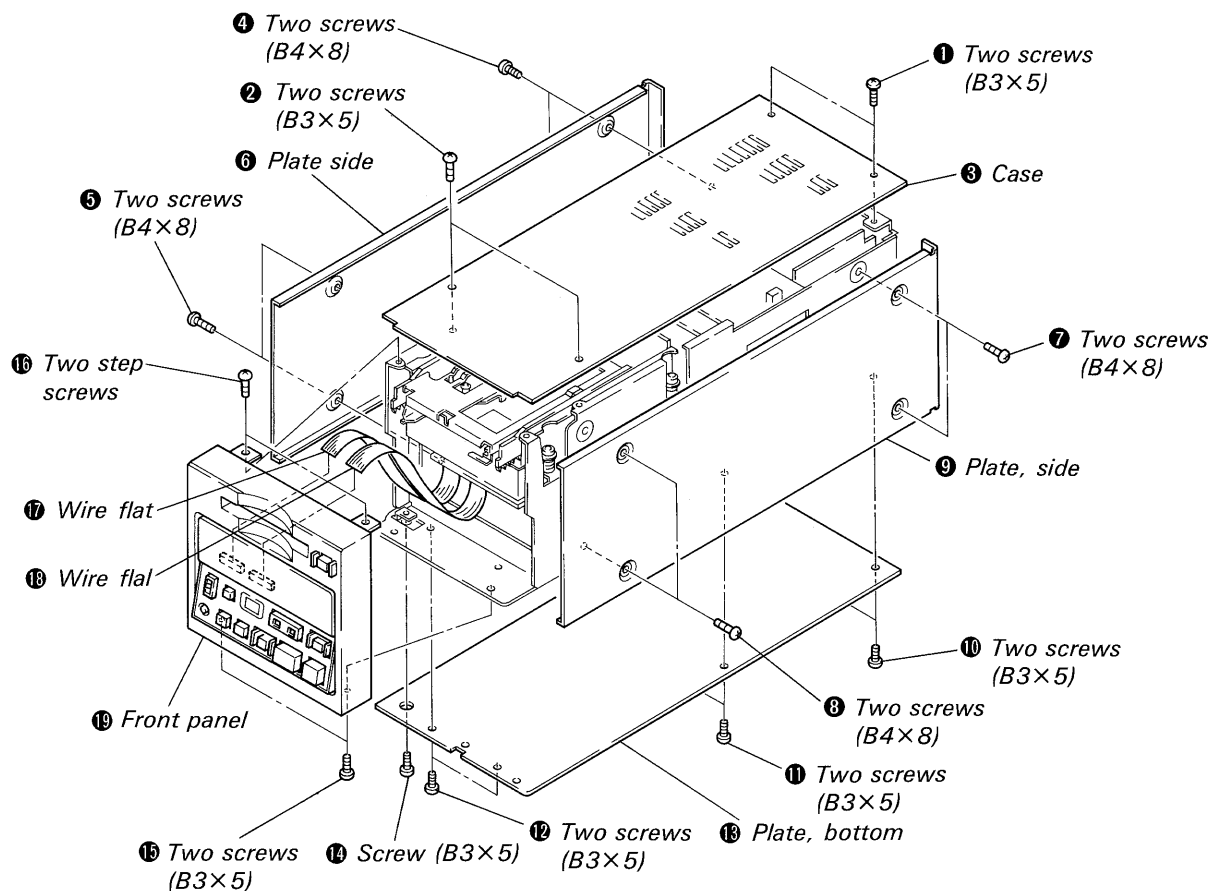


Shock-Resistant Memory System

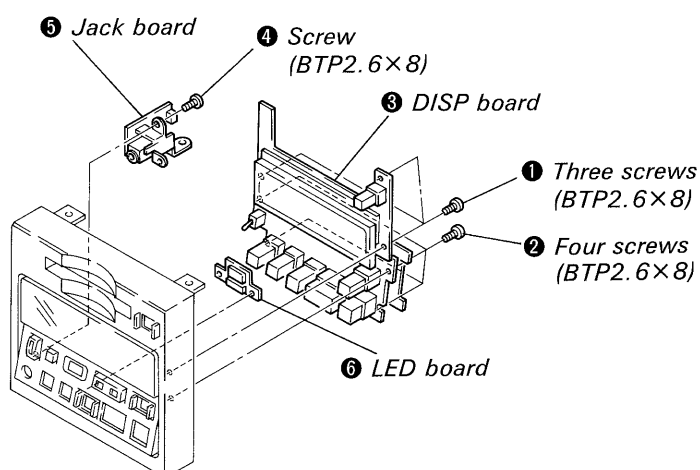
SECTION 2 DISASSEMBLY

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

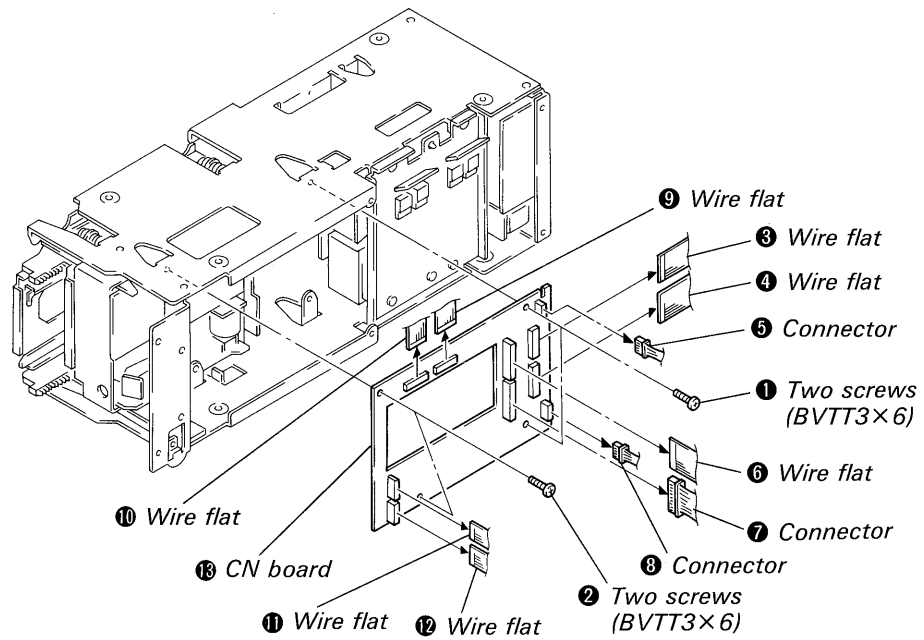
2-1. CABINET



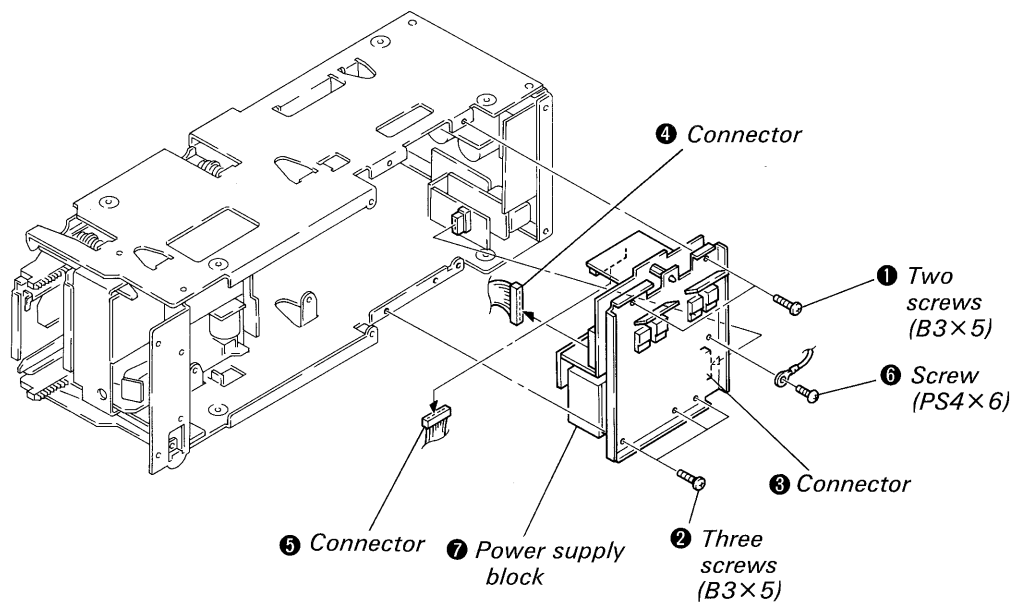
2-2. DISP BOARD, LED BOARD, JACK BOARD



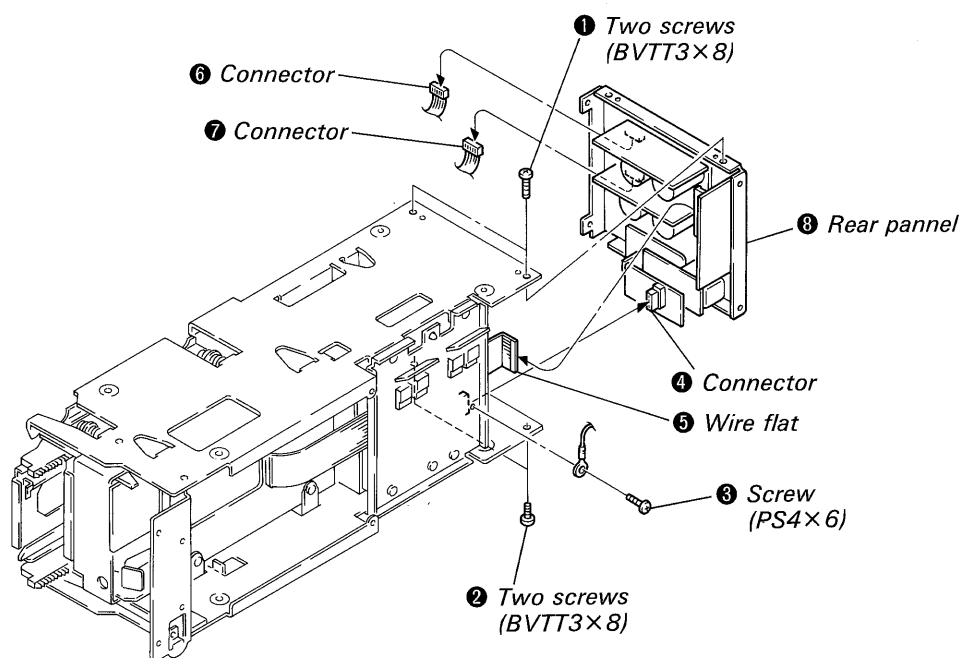
2-3. CN BOARD



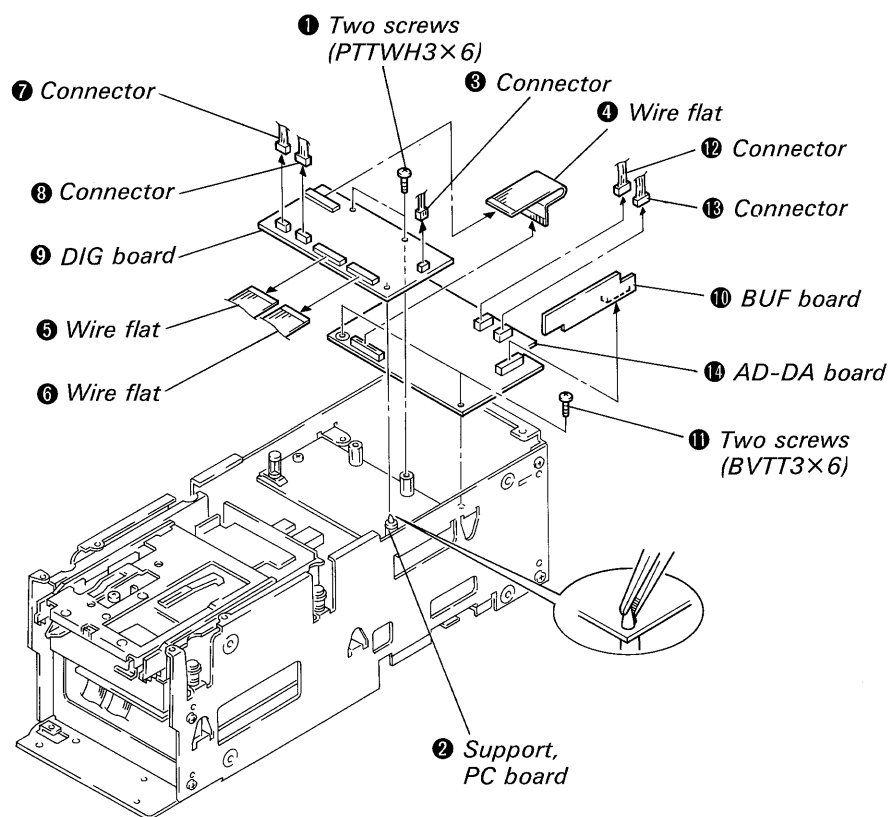
2-4. POWER SUPPLY BLOCK



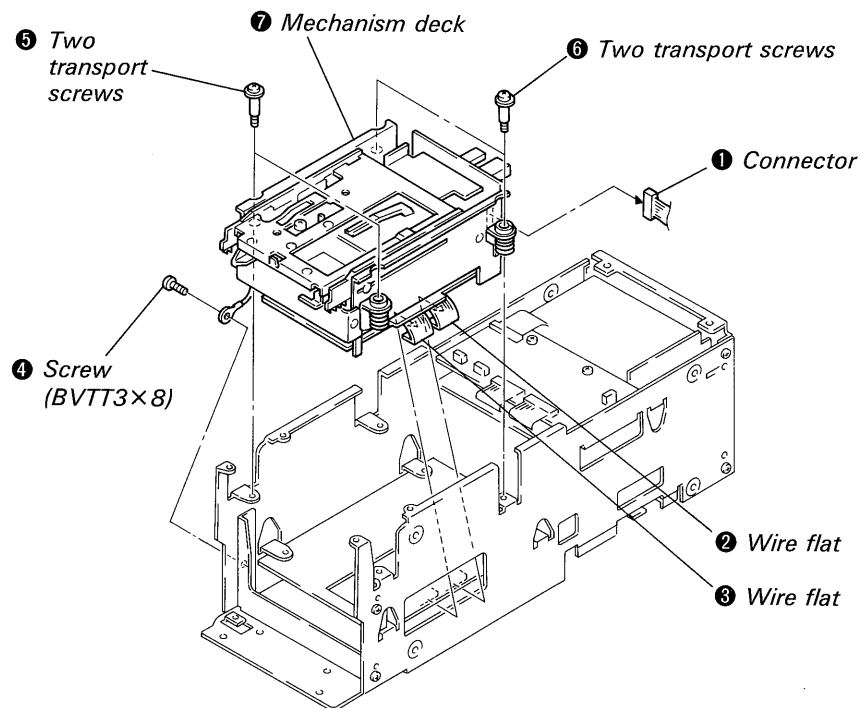
2-5. REAR PANEL BLOCK



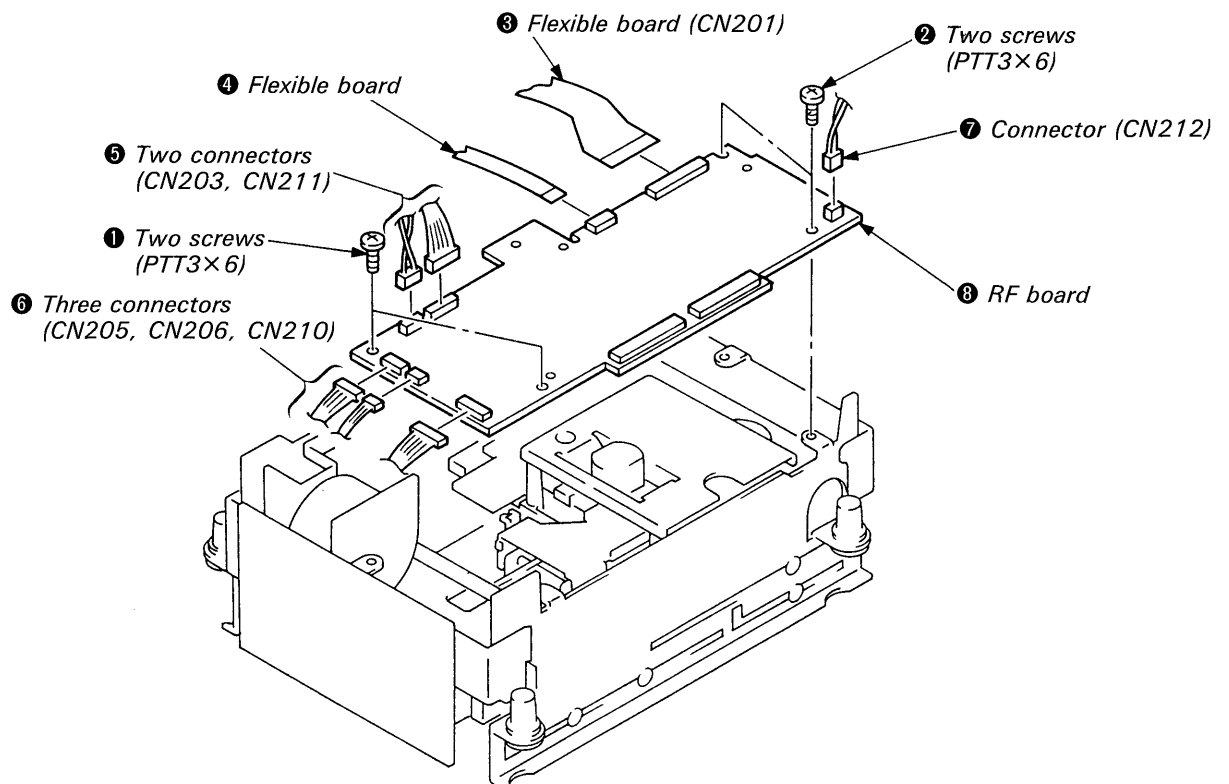
2-6. DIG BOARD, AD-DA BOARD, BUF BOARD



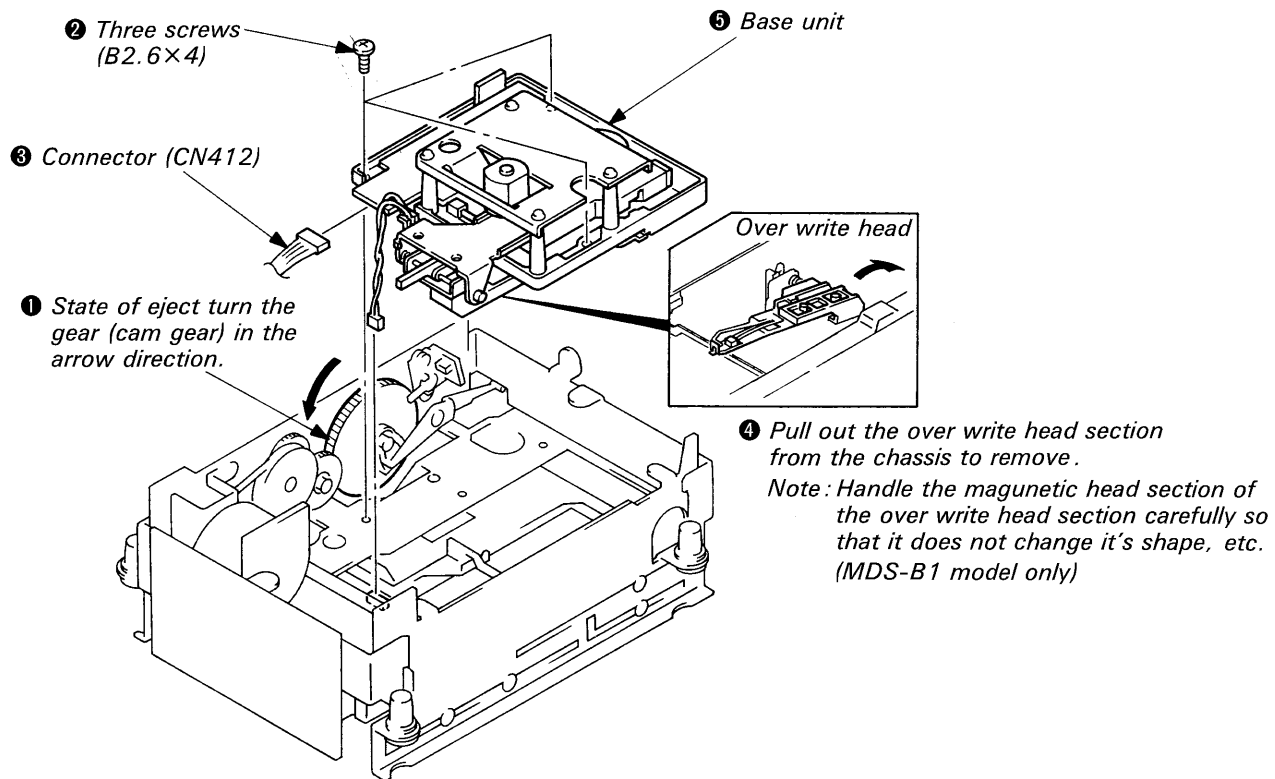
2-7. MECHANISM DECK



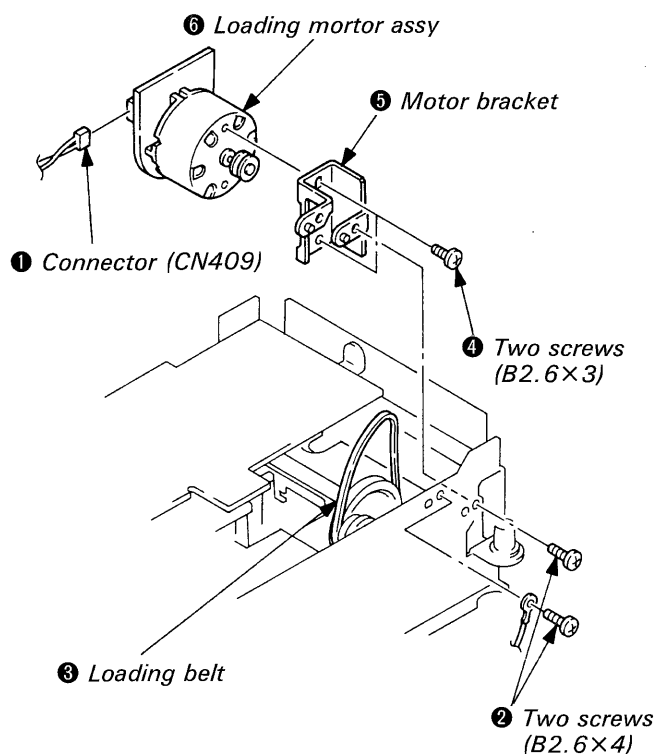
2-8. RF BOARD



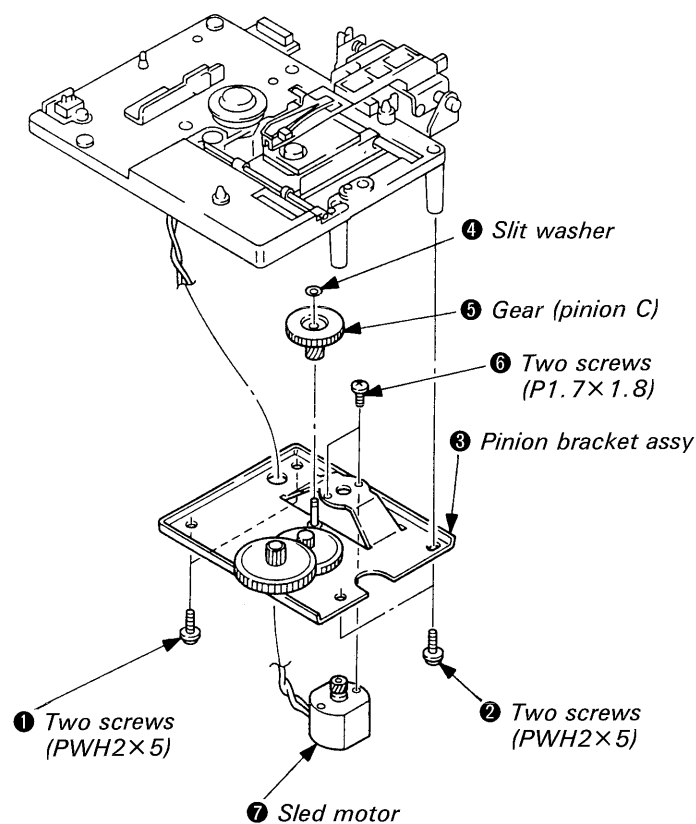
2-9. BASE UNIT



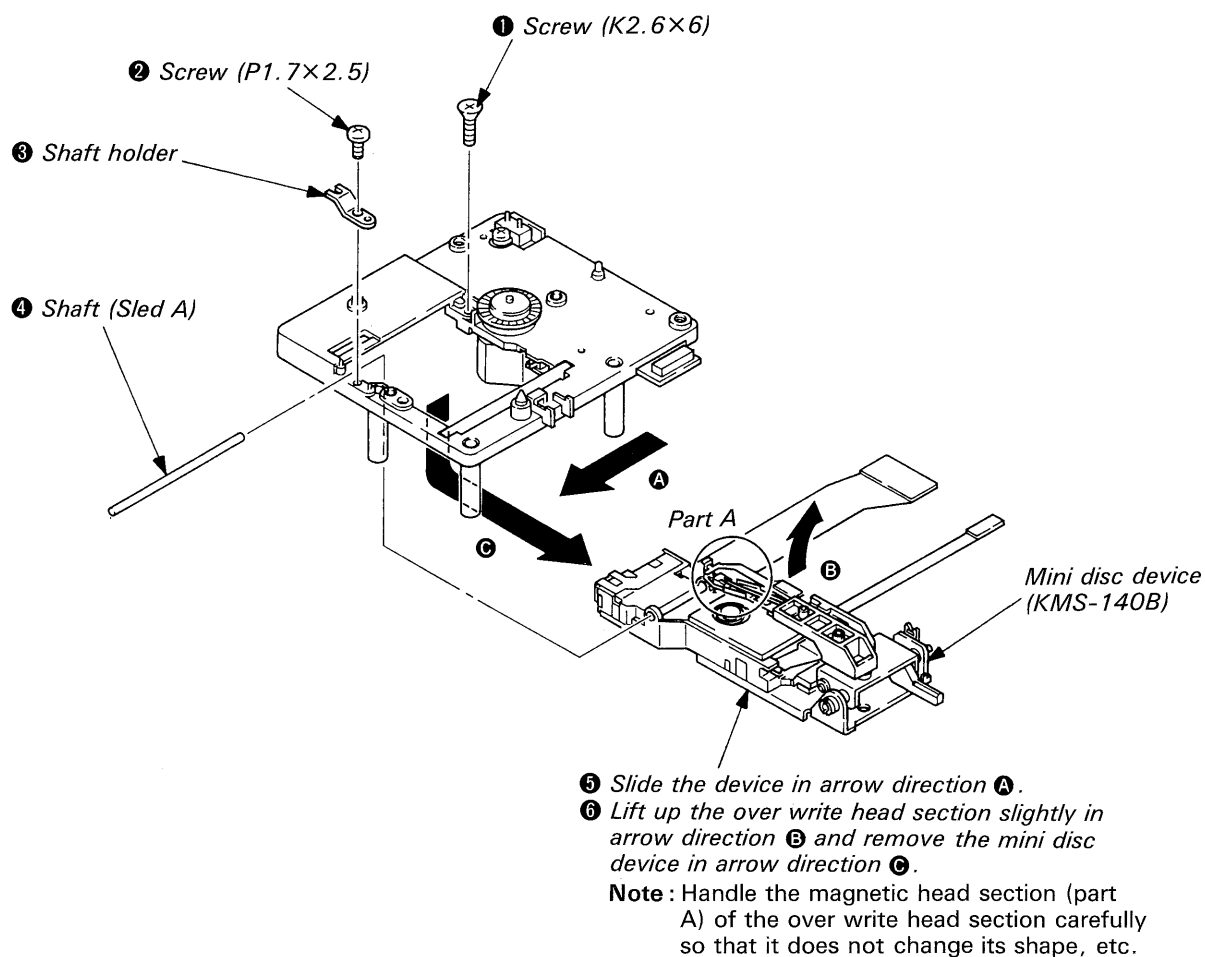
2-10. LOADING MOTOR ASSY



2-11. SLED MOTOR



2-12. MINI DISC DEVICE (KMS-140B)



SECTION 3 TEST MODE

3-1. TEST MODE SETTING

While pressing the PLAY/PAUSE ►|| key and CUE/STDBY ||► key, connect the power cord to the AC outlet, then release the PLAY/PAUSE ►|| key and CUE/STDBY ||► key.

3-2. TEST MODE RELEASING

Disconnect the power cord from the AC outlet.

3-3. TEST MODE OPERATION

[] represents main operations by each key.

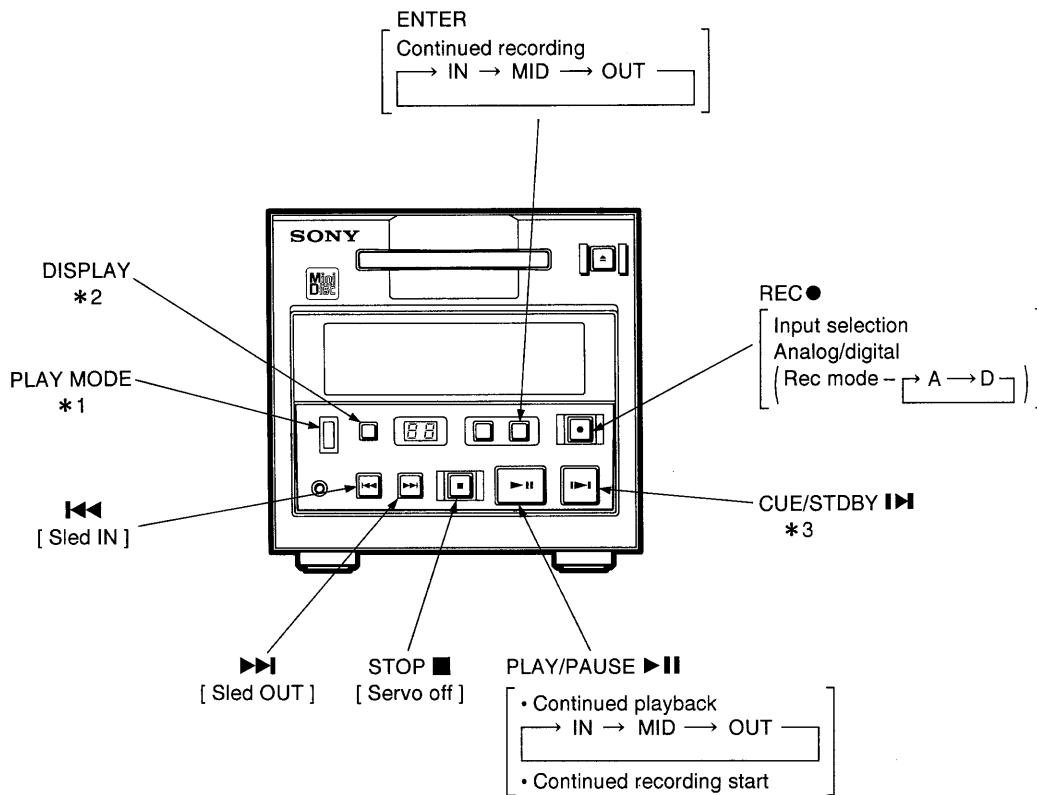


Fig. 3-1. Key arrangement

MODE KEY	*1 Play mode switch of the conditions.		
	REPEAT 1	OFF	REPEAT ALL
*2 DISPLAY	[Focus servo on]	[Laser power selection → 0C → 16 → 6F → E5]	[Tracking servo gain → LOW → HIGH]
*3 CUE/STDBY ►	[Focus servo and CLV servo on]	[RF mode selection → MO → CD → MO Pit]	[All servos on CLV servo → A → S]

Table 3-1. Key arrangement

Key	Indication	Contents	Remarks	
ENTER	CREC-IN	Continued recording on inner circumference	- Indication changes as key is pressed. - After the indication shown in the left has appeared, repeated recording occurs at the indicated position by pressing ► key. - To stop recording, press ■ key.	
	CREC-MIDDLE	Continued recording on middle circumference		
	CREC-OUT	Continued recording on outer circumference		
DISPLAY * 1	Laser Power 0C	CD reading power	- Indication changes as key is pressed, laser power is switched and laser is emitted. - To stop the laser emission, press ■ key.	
	Laser Power 16	MO reading power		
	Laser Power 6F	Laser power adjustment (3.5mV)		
	Laser Power E5	MO writing power (maximum generating power)		
DISPLAY * 2	Trk Gain Hi	Tracking servo gain UP	- Indication changes as key is pressed, and the tracking servo gain is selected. - Normally low.	
	Trk Gain Low	Tracking servo gain NORMAL		
CUE/ STDBY * 1	RF mod=MO	RF mode : MO groove	Adjusted on the MO disc groove.	Indication changes as key is pressed, and the RF mode is selected.
	RF mod=CD	RF mode : CD	Adjusted on the CD disc.	
	RF mod=MO Pit	RF mode : MO pit	Adjusted on the MO disc pit.	
EJECT ▲	OPEN	Disc ejection		
	CLOSE	Disc loading		
REC ●	Rec mode-A	Operation mode of CXD2525R : analog	PLL master mode	Indication changes as key is pressed, and the input is selected. (analog/digital)
	Rec mode-D	Operation mode of CXD2525R : digital	PLL slave mode	
►►	Sled in	Sled is moved toward inner circumference.	Sled moves during key is pressed, and stops when key is released.	
◄◄	Sled out	Sled is moved toward outer circumference.		
DISPLAY * 3	Fcs on	Focus servo on	Only focus servo is on by pressing key.	
CUE/STDBY * 3	Fcs ClvS on	Focus / spindle (S) servo on	Focus servo and spindle servo (S) are on by pressing key.	
CUE/STDBY * 2	Fcs ClvA Tr on	Focus / spindle (A) / tracking servo on	Indication changes as key is pressed, and each servo is on.	
	Fcs ClvS Tr on	Focus / spindle (S) / tracking servo on		
PLAY/ PAUSE ►	C PLAY-IN	Continued playback of inner circumference	- Indication changes as key is pressed, repeated recording occurs at the indicated position. - To stop the playback, press ■ key.	
	C PLAY-MID	Continued playback of middle circumference		
	C PLAY-OUT	Continued playback of outer circumference		
STOP ■	—	All servos off		

Table 3-2. Test mode operation

NOTE:

- * 1 : Play mode switch of the OFF conditions.
- * 2 : Play mode switch of the REPEAT ALL conditions
- * 3 : Play mode switch of the REPEAT 1 conditions.

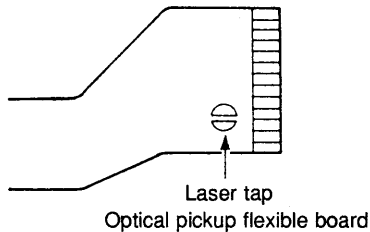
SECTION 4 ELECTRICAL ADJUSTMENTS

4-1. CAUTION ON LASER DIODE EMITTING CONFIRMATION

Never look the laser diode emission from right above when adjusting. It may cause loss of eyesight.

4-2. NOTE ON MiniDisc DEVICE (KMS-140B) HANDLING

The laser diode within the optical pickup is extremely subjected to electrostatic destruction. So, the laser tap on the flexible board should be bridge soldering when handling. Furthermore, take fully measurements against the electrostatic destruction. Take care of handling the flexible board because it can be damaged.



After replacing the MiniDisc device, perform adjustment and confirmation as follows.

- Temperature compensation offset adjustment
- Laser power adjustment
- MO groove traverse adjustment
- E-F balance adjustment
- MO pit traverse adjustment
- CD RF level adjustment
- CD traverse adjustment
- Error rate confirmation

4-3. NOTE ON ADJUSTMENT

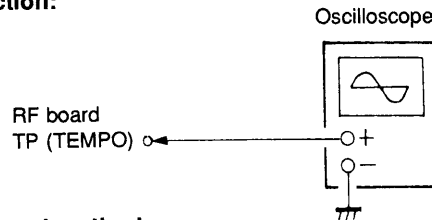
- 1) Perform adjustment in the test mode.
Release the test mode after adjustment.
- 2) Adjustment should be performed in order described.
- 3) Use jigs and measurement tools described below.
 - CD test disc TGYS-1 (Part No.: 4-959-188-01)
 - Continued recorded disc PTDM-1 (Part No.: J-2501-054-A)
 - Laser power meter LPM-8001 (Part No.: J-2501-046-A)
 - Error rate counter MDPE-1 (Part No.: J-2501-047-A)
 - Oscilloscope (band more than 40 MΩ, Calibrate the probe before performing the measurement.)
 - Digital volt meter
 - Temperature meter

4-4. OFFSET ADJUSTMENT

Note: This adjustment should be performed immediately after setting the test mode. Performing other adjustments switch the operation mode, and the correct adjustment can not be performed.

1) Temperature compensation offset adjustment

Connection:



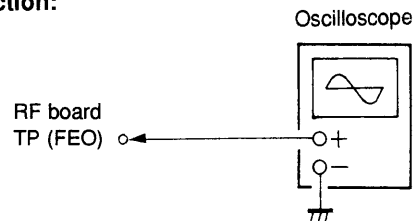
Adjustment method:

1. Connect the oscilloscope to TP (TEMPO) on the RF board.
2. Adjust RV205 on the RF board so that the reading on the oscilloscope meets the specification.

Specification: $0 \pm 50\text{mV}$ (25°C)
 $+27\text{mV}/^\circ\text{C}$ (Increased by 27mV with every increasing temperature by 1°C)

2) Focus bias offset adjustment

Connection:

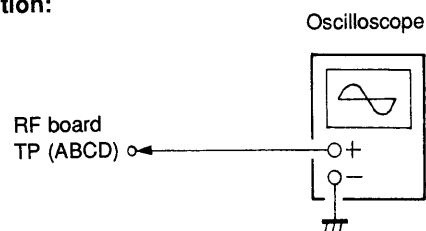


Adjustment method:

1. Connect the oscilloscope to TP (FEO) on the RF board.
2. Adjust RV208 on the RF board so that the reading on the oscilloscope becomes $0 \pm 20\text{mV}$.

3) FOK offset adjustment

Connection:

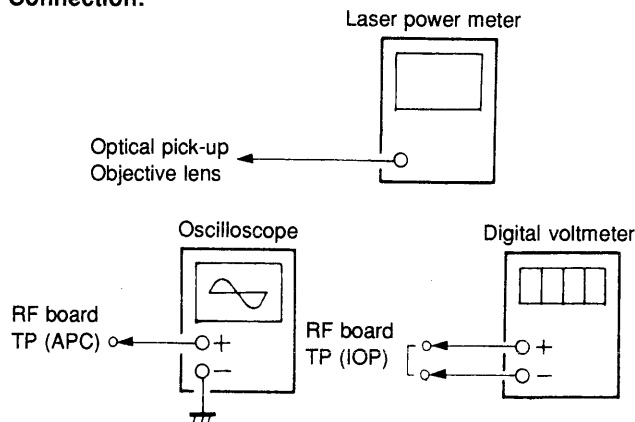


Adjustment method:

1. Connect the oscilloscope to TP (ABCD) (IC209^③) on the RF board.
2. Adjust RV207 on the RF board so that the reading on the oscilloscope becomes $0 \pm 20\text{mV}$.

4-5. LASER POWER ADJUSTMENT

Connection:



Adjustment method:

1. Place the laser power meter on the objective lens of the optical pick-up. (If setting can not be made correctly, move the sled using the **▶▶** or **◀◀** key.)
Connect the oscilloscope to TP (APC) on the RF board, the digital voltmeter to TP (IOP) respectively.
2. Play mode switch of the OFF conditions.
3. Press the DISPLAY key to let "Laser Power 6F" appear. (laser power : for adjustment)
4. Adjust RV204 on the RF board so that the reading on the laser power meter becomes $3.6 \pm 0.1 \text{ mW}$.
At this time, confirm that the reading on the oscilloscope is $1.5 \pm 0.1 \text{ V}$.
5. Play mode switch of the OFF conditions.
6. Press the DISPLAY key to let "Laser Power E5" appear. (laser power : MO writing)
7. At this time, confirm that the reading on the laser power meter, oscilloscope and digital voltmeter meet the specifications shown below.

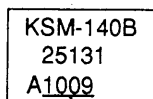
Specifications:

Laser power meter : $7.0 \begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix} \text{ mW}$

Oscilloscope: $3.0 \pm 0.1 \text{ V}$

Digital voltmeter: Optical pickup reading $\pm 5 \text{ mA}$

(Optical pickup level)



In this case : $I_{op} = 100.9 \text{ mA}$

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

8. Play mode switch of the OFF conditions.
9. Press the DISPLAY key to let "Laser Power 16" appear. (laser power : MO reading)
10. At this time, confirm that the reading on the laser power meter and oscilloscope become the specifications shown below.

Specifications:

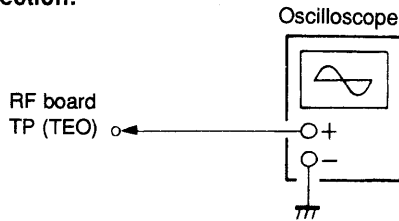
Laser power meter : $0.85 \pm 0.04 \text{ mW}$

Oscilloscope : $0.37 \pm 0.1 \text{ V}$

11. Press the STOP **■** key to stop the laser emitting.

4-6. MO TRAVERSE ADJUSTMENT

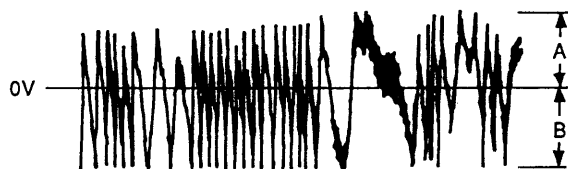
Connection:



Adjustment method:

1. Connect the Oscilloscope to TP (TEO) on the RF board.
2. Insert a MO disc (standard product).
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=MO" appear. (RF mode : MO groove)
5. Move the sled from pit to outer circumference by pressing the **◀◀** or **▶▶** key.
6. Play mode switch of the REPEAT 1 conditions.
7. Press the CUE/STDBY **▶▶** key. (Focus / spindle (S) servo on, tracking servo off)
8. Adjust the RV201 on the RF board so that the waveform of the oscilloscope meets the specification. (MO groove traverse adjustment)

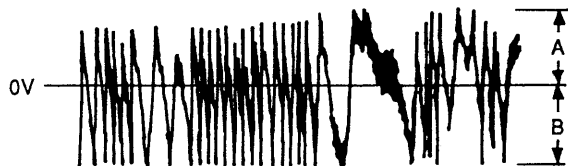
(Traverse waveform)



Specification: A=B

9. Play mode switch of the OFF conditions.
10. Press the DISPLAY key to let "laser Power E5" appear. (laser power : MO writing)
11. Adjust the RV209 on the RF board so that the waveform of the oscilloscope meets the specification. (E-F balance adjustment)

(Traverse waveform)



Specification: A=B

12. Play mode switch of the OFF conditions.
13. Press the DISPLAY key to let "Laser Power 16" and "Laser Power E5" appear alternatively, and repeat adjustment until both offset values meet the specifications.
14. Press the STOP **■** key.
15. Move the sled to the pit portion (inner most circumference) by pressing **◀◀** key.
16. Play mode switch of the OFF conditions.
17. Press the CUE/STDBY **▶▶** key to let "RF mod=MO pit" appear. (RF mode : MO Pit)
18. Play mode switch of the REPEAT 1 conditions.
19. Press the CUE/STDBY **▶▶** key. (Focus/spindle (S) servo on, tracking servo off)
20. Adjust the RV202 on the RF board so that the waveform of the oscilloscope meets the specification. (MO pit traverse adjustment)

(Traverse waveform)

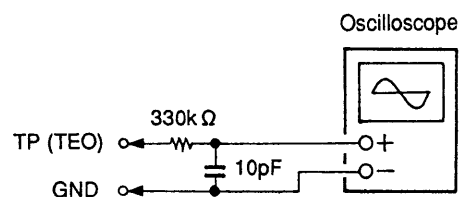


Specification: A=B

21. Press the STOP **■** key.
22. Press the EJECT **▲** key to take out the MO disc.

Note 1: If a recorded disc is used for this adjustment, the data is erased when MO writing.

Note 2: If it is hard to observe the traverse waveform, connect the oscilloscope as shown below. The appearance is improved.

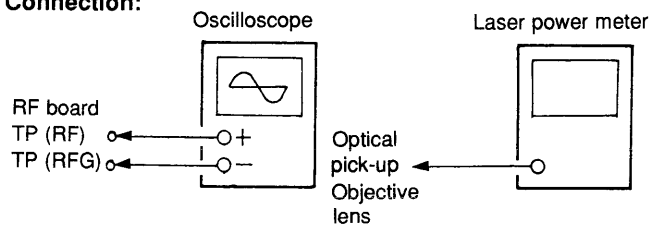


4-7. CD RF LEVEL ADJUSTMENT

Condition:

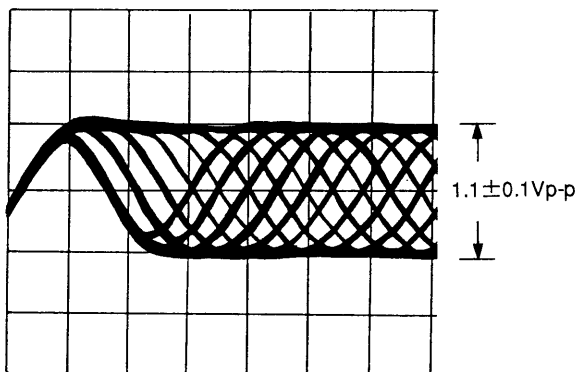
Perform adjustment in the condition where the unit is in horizontal.

Connection:



Adjustment method:

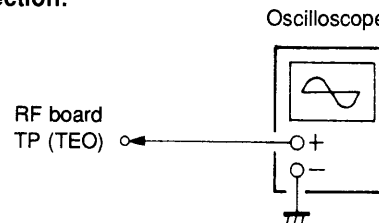
1. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to perform repeated playback.
6. Adjust the RV215 on the RF board so that the RF level of the oscilloscope becomes $1.1 \pm 0.1V_{p-p}$.



7. Press the STOP **■** key to stop playback.
8. Press the EJECT **▲** key to take out the test disc.
9. Place the laser power meter on the objective lens of the optical pickup. (If setting can not be made correctly, move the sled using **▶▶** or **◀◀** key.)
10. Play mode switch of the OFF conditions.
11. Press the DISPLAY key to let "Laser Power 0C" appear.
(laser power : CD reading)
12. Confirm that the reading of the laser power meter is $0.49 \pm 0.06mW$.
13. Press the STOP **■** key to stop laser diode emitting.

4-8. CD TRAVERSE ADJUSTMENT

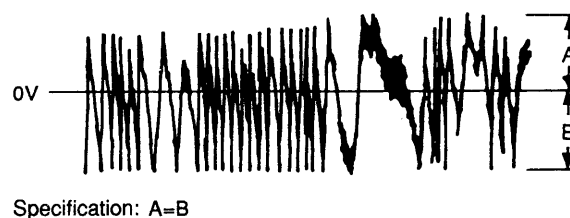
Connection:



Adjustment method:

1. Connect the Oscilloscope to TP (TEO) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Play mode switch of the REPEAT 1 conditions.
6. Press the CUE/STDBY **▶▶** key. (Focus/spindle (S) servo on, tracking servo off)
7. Adjust the RV203 on RF board so that the reading on the oscilloscope meets the specification.

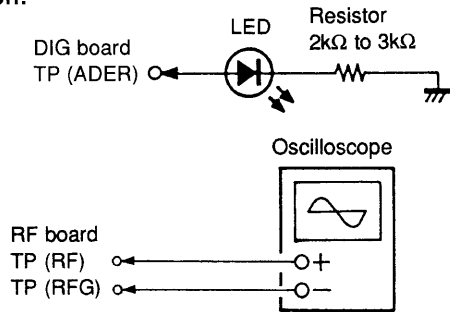
(Traverse waveform)



8. Press the STOP **■** key.
9. Press the EJECT **▲** key to take out the test disc.

4-9. MO FOCUS BIAS ADJUSTMENT

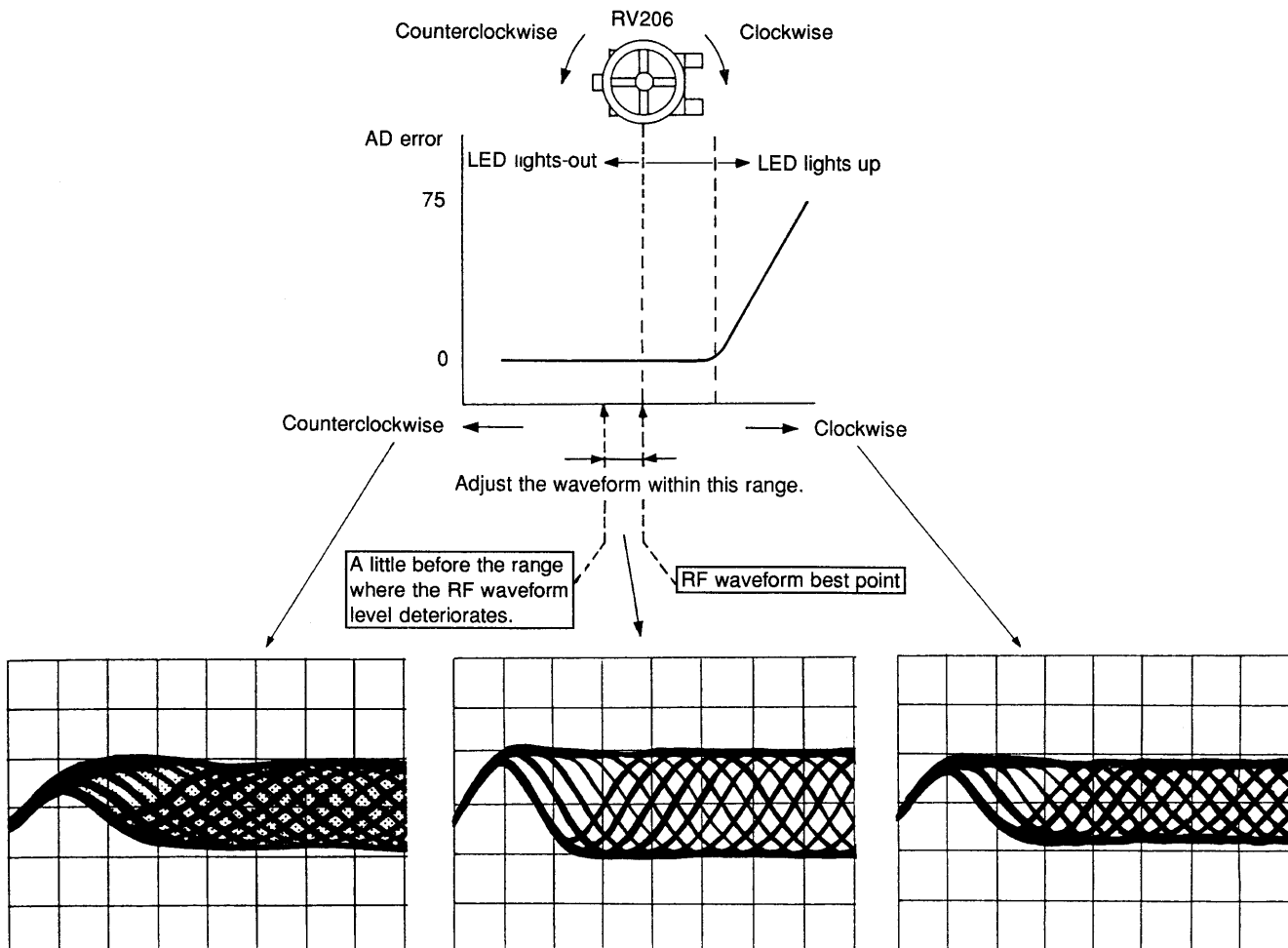
Connection:



Adjustment method:

1. Connect the LED and resistor (2 to 3kΩ) to TP (ADER) on the DIG board.
2. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board.
3. Insert the continued recorded disc PTDM-1.
4. Play mode switch of the OFF conditions.
5. Press the CUE/STDBY **▶||** key to let "RF mod=MO" appear.
(RF mode : MO groove)
6. Press the PLAY/PAUSE **▶||** key to let "C PLAY-MID" appear.
(middle circumference repeated playback)
(Performing adjustment about two minutes after PLAY/PAUSE **▶||** key is pressed allows more accurately adjustment since the adjustment is performed at the continued recording portion.)
7. Adjust the RV206 on the RF board so that the eye-pattern of the oscilloscope correctly appears. (rough adjustment)
(The correct eye-pattern means that ◇ shape can be identified clearly at the center of waveform.)
8. While monitoring the LED connected to the DIG board and the RF waveform of the oscilloscope, adjust the RV206 so that "AD error best point" is obtained. (fine adjustment)
(The "AD error best point" is a point where the RF waveform does not deteriorate and the LED connected to the DIG board does not light up or lights up once a ten seconds by turning the RV206 from the point where the LED lights up to pass the best point a little.)
9. Press the STOP **■** key to stop the playback.
10. Press the EJECT **▲** key to take out the continued recorded disc.

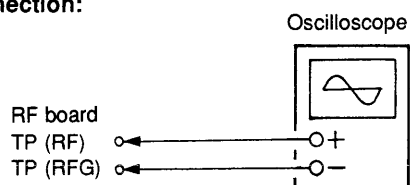
Normally, a relation between the RF waveform and AD error is as follows.



4-10. CD FOCUS BIAS ADJUSTMENT

Method requiring no error rate counter

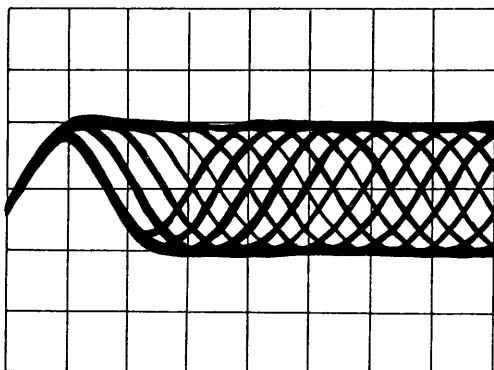
Connection:



Adjustment method:

1. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to perform repeated playback.
6. Adjust the RV212 on the RF board so that the eye-pattern of the oscilloscope correctly appears.
(The correct eye-pattern means that ◇ shape can be identified clearly at the center of waveform.)

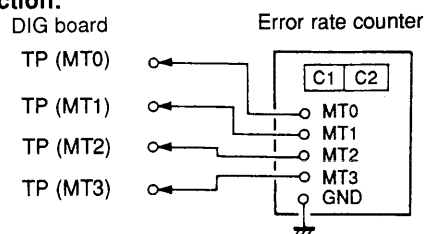
An example of RF waveform



7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **▲** key to take out the test disc.

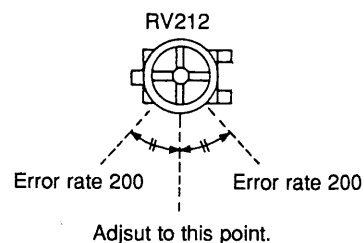
Method requiring error rate counter

Connection:



Adjustment method:

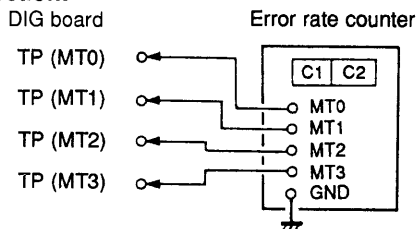
1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to let "C PLAY-MID" appear.
(middle circumference repeated playback)
6. Turn the RV212 on the RF board so that the error rate (C1) of the error rate counter becomes 200 at two points. Measure these two points and adjust the RV212 to the mechanical center.



7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **▲** key to take out the test disc.

4-11. ERROR RATE CONFIRMATION

Connection:



CD error rate confirmation:

1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **⏮** key to let "RF mod=CD" appear. (RF mode : CD)
5. Press the PLAY/PAUSE **▶** key to let "C PLAY-MID" appear. (middle circumference repeated playback)
6. Confirm that the error rate (C1) of the error rate counter is less than 20.
7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **⏏** key to take out the test disc.

MO repeated recording disc making: (MDS-B1 model only)

1. Insert a standard product MO disc (blank disc).
2. Play mode switch of the OFF conditions.
3. Press the CUE/STDBY **⏮** key to let "RF mod=MO" appear. (RF mode : MO)
4. Press the **▶▶** key to move the sled to outer circumference.
5. Press the ENTER key to let "CREC-MID" appear. (middle circumference continued recording)
6. Press the PLAY/PAUSE **▶** key to start recording. (End the recording within one minute.)
7. Press the STOP **■** key to stop the recording.
8. Press the EJECT **⏏** key to take out the test disc.

Performing these steps described above permits continued recorded disc for MO error rate confirmation.

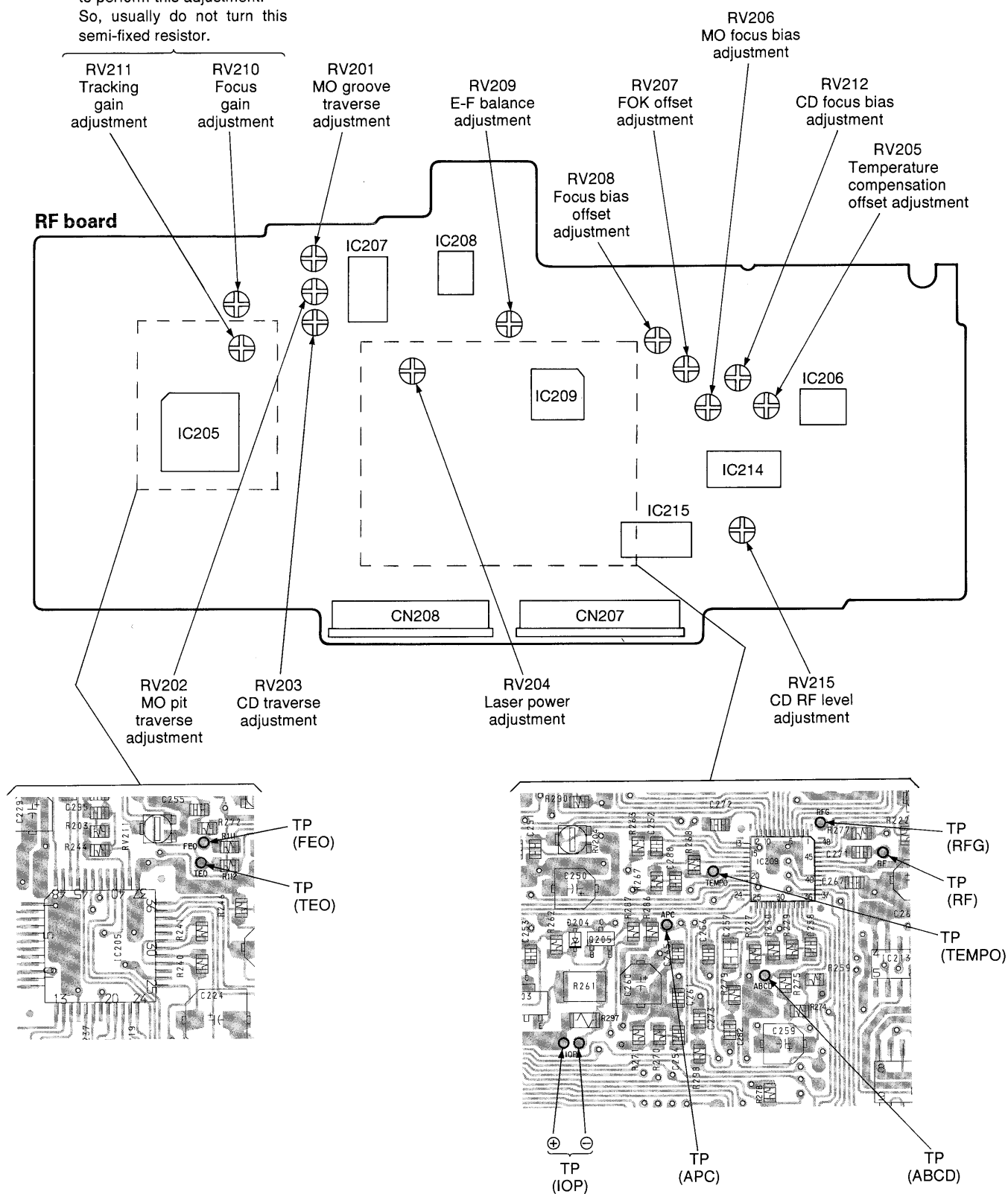
MO error rate confirmation: (MDS-B1 model only)

Note: Be sure to use the disc (self recorded/played back) made in above steps.

1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the continued recorded disc made in above steps.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **⏮** key to let "RF mod=MO" appear. (RF mode : MO)
5. Press the **▶▶** key to move the sled to outer circumference.
6. Press the PLAY/PAUSE **▶** key to let "C PLAY-MID" appear. (middle circumference continued playback)
7. Confirm that the error rate (C1) of the error rate counter is less than 50.
8. Press the STOP **■** key to stop the playback.
9. Press the EJECT **⏏** key to take out the test disc.

4-12. ADJUSTMENT LOCATION

A servo analyzer is required to perform this adjustment.
So, usually do not turn this semi-fixed resistor.



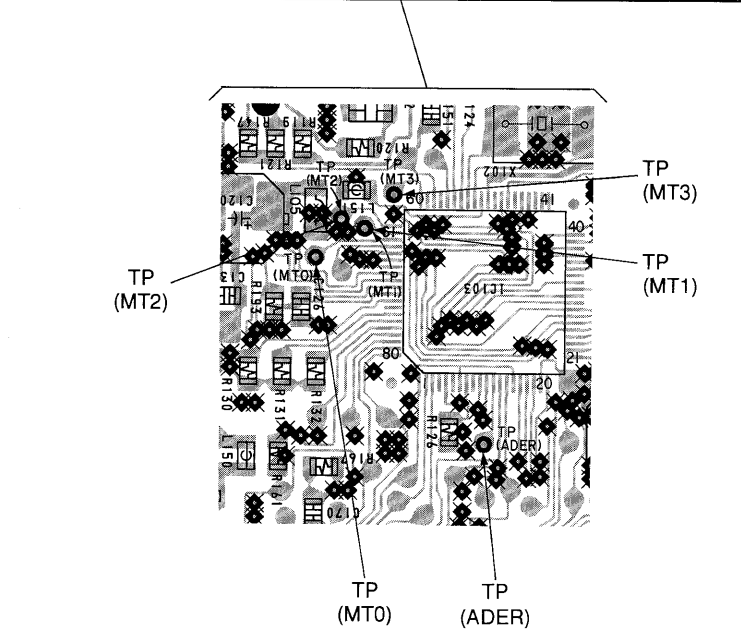
IC101

IC103

IC106

IC111

The diagram shows four integrated circuits. IC101 is a square chip on the left. IC103 is a square chip in the center, enclosed in a dashed rectangular box. IC106 is a small square chip at the top, with a semi-circular notch on its bottom edge. IC111 is a rectangular chip on the right. A line points from the bottom of the dashed box around IC103 to the text 'IC103' in the adjacent paragraph.



SECTION 5

IC PIN FUNCTIONS

IC103 EFM/ACIRC ENCODER/DECODER (CXD2525R)

* (3) of I/O is state output and (A) is analog output.

Pin Name	Signal Name	I/O	Function
1	MDP	O (3)	Spindle motor servo control
2	MDS	O (3)	Spindle motor servo control
3	EFMI	I	Playback EFM input
4	ASY	O	Playback EFM full-swing output
5	LOCK	O	Spindle servo (CLV) lock state monitor. Locks at "H".
6	VCOO	O	EFM decoder analog PLL oscillation output (196Fs=8.6436 MHz)
7	VCOI	I	EFM decoder analog PLL oscillation input (196Fs=8.6436 MHz)
8	TEST1	I	Test pin. Normally GND.
9	PDO	O (3)	EFM decoder analog PLL phase comparison output
10	VSS	—	Digital GND
11	EFMO	O	EFM output during recording
12	ATER	O	ADIP CRC flag output. "H" when error.
13	CNIN	I	Track jump number count signal input
14	SENS	O (3)	Internal status output pin for the serial bus address
15	SYPL	I	SQSY, ADSY, DQSY, MQSY polarity switching input pin. Active high when "H".
16	FILO	O (A)	Digital PLL master PLL filter output
17	FILI	I	Digital PLL master PLL filter input
18	PCO	O (3)	Digital PLL master PLL phase comparison output
19	AVSS	—	Analog GND
20	CLTV	I	Digital PLL master PLL VCO control voltage input
21	AVDD	—	Analog power supply
22	XRST	I	System reset input. Active low
23	REC	I	Decoder when "L" and encoder when "H"
24	TEST8	I	Test pin. Normally GND
25	SCLK	I	Serial bus clock input
26	XLAT	I	Serial bus latch input
27	SWDT	I	Serial bus writing data input
28	SRDT	O (3)	Serial bus reading data output
29	ADSY	O	ADIP sync output
30	SQSY	O	Sub code Q sync output
31	VDD	—	Digital power supply
32	DQSY	O	Sync (SCOR) output of sub code Q of the digital in U-bit CD format
33	TEST7	O	Open
34	DTI	I	Recording audio signal input
35	DTO	O (3)	Playback audio signal output. High impedance during recording
36	C2PO	O	PLayback: C2PO. Digital REC: D, In-VFLAG. Analog REC: 0
37	BCK	O	2.8224 MHz output (MCLK system)
38	XBCK	O	BCK reverse output (MCLK system)
39	LRCK	O	44.1 kHz (=Fs) (MCLK system)
40	WDCK	O	88.2 kHz (MCLK system)

Pin Name	Signal Name	I/O	Function
41	FS4	O	176.4 kHz (MCLK system)
42	GTOP	O	Opens the sync protection window when "H" (INPUT EFM SYNC monitor output)
43	XUGFS	O	Unguarded frame sync at "L" (INPUT EFM SYNC monitor output)
44	XPLCK	O	EFM decoder PLL clock output (98Fs=4.3218MHz)
45	GFS	O	Frame sync OK at "H" (INPUT EFM SYNC monitor output)
46	EPDO	O (3)	EFM encoder external PLL phase comparison output. Freq.: low → "H"
47	RFCK	O	7.35 kHz output (MCLK system)
48	EVC1	I	EFM encoder external PLL oscillation input (196 Fs=8.6436 MHz)
49	EVCO	O	EFM encoder external PLL oscillation output (196 Fs=8.6436 MHz)
50	VSS	—	Digital GND
51	MCLK	O	22.579 MHz output. Duty will not be protected.
52	XTA1	I	Crystal oscillation input (512 Fs=22.5792 MHz)
53	XTAO	O	Crystal oscillation output (512 Fs=22.5792 MHz)
54	TEST9	I	Fixed at "L"
55	MVC1	I	Digital-in PLL oscillation input (512 Fs=22.5792 MHz)
56	MVCO	O	Digital-in PLL oscillation output (512 Fs=22.5792 MHz)
57	TEST2	O	Fixed at "Open"
58	DIPD	O (3)	Digital PLL phase comparison output. Freq.: low → "L"
59	RAOF	O	RAM overflow output (Monitor output of decoder)
60	MT3	O	Playback corrected state monitor output
61	MT2	O	Playback corrected state monitor output
62	MT1	O	Playback corrected state monitor output
63	MT0	O	Playback corrected state monitor output
64	WFCK	O	7.35 kHz output (EFM decoder PLL system during playback, EFM encoder PLL system during recording)
65	DIN	I	Digital audio input pin
66	MD2	I	Digital audio out ON/OFF pin. ON when "H"
67	DOUT	O	Digital audio output pin
68	DIDT	O	Audio data output pin of the digital audio input pin
69	DODT	I	16-bit data input pin for the digital audio output
70	DOVF	I	Validity flag input pin for the digital audio
71	VDD	—	Digital power supply
72	TEST3	I	Fixed at "L"
73	TEST4	O	Fixed at "Open"
74	TEST5	I	Fixed at "L"
75	TEST6	I	Fixed at "L"
76	FMCK	I	ADIP reading clock input (6.3 kHz) (TTL Schmidt input)
77	FMDT	I	ADIP data input (TTL Schmidt input)
78	ADFG	I	ADIP carrier signal input (20.05 kHz) (TTL Schmidt input)
79	FSW	O (3)	Spindle motor output filter switching output. "Z" when CLV-P. Others: "L"
80	NON	O	Spindle motor ON/OFF control output. ON when "H"

- Note:**
- XUGFS is a frame sync obtained from the EFM signal and is a negative pulse. Signal before sync protection.
 - PLL is made for XPLCK so that changes in the reversion and falling edge of the EFM PLL clock and the EFM signal match.
 - The GFS signal becomes "H" when the frame sync and interpolation protection timing match.
 - C2PO is a signal which shows the error state of the data.
 - RAOF is a signal generated when the 32K RAM exceeds the $\pm 4F$ jitter margin.

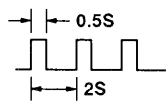
IC110 Shockproof Memory Controller (CXD2526Q)

Pin Name	Signal Name	I/O	Function
1	A14	O	When RMSL is H: SRAM address bus A14. When RMSL is L: WFFUL (Note)
2	A15	O	When RMSL is H: SRAM address bus A15. When RMSL is L: RFEMP (Note)
3	A16	O	When RMSL is H: SRAM address bus A16. When RMSL is L: WFOVF (Note)
4	A17	O	When RMSL is H: SRAM address bus A17. When RMSL is L: WDTM (Note)
5	A18	O	When RMSL is H: SRAM address bus A18. When RMSL is L: ZERO (Note)
6	A19	O	When RMSL is H: SRAM address bus A19. When RMSL is L: MDTSC (Note)
7	A20	O	When RMSL is H: SRAM address bus A20. When RMSL is L: CMPSY (Note)
8	LRCK	I	LRCK input from the EFM encoder/decoder
9	BCK	I	BCK input from the EFM encoder/decoder
10	C2PO	I	C2PO input from the EFM decoder
11	DATA	I/O	Input/output data from the decoder during playback and that to the encoder during recording
12	VSS	—	GND
13	TEST	I	Test pin. Normally fixed at “L”
14	XRST	I	Reset input. Resets when “L”
15	MIN	I	External input monitor signal input pin. Inputs the signal to be monitored
16	SRDT	(HiZ) O	Microprocessor serial data output pin “Hi-z” when the CXD2526 read register is not selected
17	SWDT	I	Microprocessor serial data input pin
18	XSLT	I	Microprocessor serial data latch signal input pin
19	SCK	I	Microprocessor serial data shift lock input pin
20	SCTX	I	Data output enable signal input pin in the recording mode
21	RCPB	I	“L”: Playback mode, “H”: Recording mode
22	WRMN	I	“H”: Write mode, “L”: Monitor mode
23	SBMN	I	“H”: Records the input signal according to the SDCT. “L”: Records according to the DCT
24	XINT	O	Interrupting request output pin. “L” when the interrupting status is generated
25	MDSY	O	Input data MD sync detection signal
26	MEMFUL	O	“H” when the main data area is full with data
27	MEMEMP	O	“H” when the main data area is empty
28	UNDER	O	“H” when $RMS < THUND$
29	OVER	O	“H” when $RMS \geq THOVR$
30	ERWR	O	“H” when the data which C2PO is effective is written in the RAM
31	BTOV4	O	“H” when $BCT \geq 400$ (Hex)
32	TXST	O	“H” when data is transmitted
33	VDD	—	System power supply
34	BUSY	I/O	“H” when RAM is accessed
35	ZZ2	I	Test signal. Fixed at “L”
36	ZZ1	I	Test signal. Fixed at “L”
37	ZZ0	I	Test signal. Fixed at “L”
38	XALT	O	Data ready or latch signal to CXD2527
39	ADT1	I	Pin for data input from CXD2527
40	ADTO	O	Pin for data output to CXD2527
41	ACK	O	Pin for data input/output clock output to CXD2527
42	AC2	O	Pin for output data C2PO output to CXD2527
43	XRQ	I	Pin for data request signal input from CXD2527

Pin Name	Signal Name	I/O	Function
44	SDCK	I	External sub data I/F shift clock input
45	SBDT	I/O	External sub data I/F data output pin in the playback mode and the data input pin in the recording mode
46	XWT	O	External sub data I/F wait signal. Must not transmit the clock for reading the new data at "L"
47	SRDY	O	External sub data I/F access permission signal. Ignores the clock for sub data R/W if it is transmitted at "H"
48	MCK	O	128 fs output pin
49	F256	O	256 fs output pin
50	XTLO	O	System clock output pin (22.5792 MHz)
51	XTLI	I	System clock input pin (22.5792 Mhz)
52	VSS	—	GND
53	TEST	I	Fixed at "L"
54	RMSL	I	External RAM select pin. "H": SRAM. "L": DRAM
55	ERR	I/O	C2PO input/output pin when EXTC2R is "H"
56	D7	O	SRAM data line D7 when RMSL is "H". Test signal when "L".
57	D4	I/O	RAM data bus D4 when RMSL is "H". Test signal when "L".
58	D0	I/O	RAM data bus D0
59	D1	I/O	RAM data bus D1
60	D3	I/O	RAM data bus D3
61	D2	I/O	RAM data bus D2
62	XCAS	I/O	DRAM $\overline{\text{CAS}}$ output when RMSL is "L". Data bus D6 when "L"
63	XOE	O	RAM output enable
64	A10	O	RAM address bus A10
65	XWE	O	RAM write enable
66	XRAS	I/O	DRAM $\overline{\text{RAS}}$ output when RMSL is "L". Data bus D5 when "H"
67	A11	O	RAM address bus A11
68	A9	O	RAM address bus A9
69	A0	O	RAM address bus A0
70	A1	O	RAM address bus A1
71	A2	O	RAM address bus A2
72	A3	O	RAM address bus A3
73	VDD	O	System power
74	A8	O	RAM address bus A8
75	A7	O	RAM address bus A7
76	A6	O	RAM address bus A6
77	A5	O	RAM address bus A5
78	A4	O	RAM address bus A4
79	A12	O	RAM address bus A12 when RMSL is "H". CS output when "L"
80	A13	O	RAM address bus A13 when RMSL is "H". SYOK output when "L"

Note: WFFUL: Becomes "H" when the writing FIFO becomes full.
 RFEMP: Becomes "H" when the reading FIFO becomes empty.
 WFOVF: Becomes "H" when the writing FIFO becomes overflow.
 WDTM: Outputs the window timing inside the D1 clock.
 ZERO: Outputs "H" when BCT is 0.
 MDTSC: Becomes "H" when the input data header selector is 00 to IF and "L" at other times.
 CMPSY: Interpolation sync timing.

IC111 MECHANISM MICROPROCESSOR (M38067M8-065FP)

Pin Name	Signal Name	I/O	Function
1 to 3	KEY 2 to KEY 0	I	Not used
4	—	I	Not used
5	DFATT	O	Serial data to the digital filter
6	DFSHIFT	O	Serial clock to the digital filter
7	DFLATCH	O	Latch to the digital filter
8	XLAT	O	Latch to the serial bus
9	SCLK	O	Clock to the serial bus
10	SWDT	O	Data to the serial bus
11	SRDT	I	Data from the serial bus
12	APCREP	O	Reference voltage output of the laser power. Four levels: OFF, CD, MO READ, MO WRITE.
13 to 15	—	I	Not used
16	ADSY	I	ADIP sync. "L" every 13.3 ms. Almost "H".
17	SQSY	I	Sub-code Q sync. "L" every 13.3 ms. Almost "H".
18	DQSY	I	U-bit CD format sub-code Q sync of digital in. "L" every 13.3 ms. Almost "H".
19	SENS	I	Status from the serial bus.
20	MINT	O	Request for temporary interruption of communication with the master microprocessor. The master microprocessor does not send the clock during "H".
21	CLK	I	Communication clock from the master microprocessor
22	TXD	O	Serial data to the master microprocessor
23	RXD	I	Serial data from the master microprocessor
24	XINT	I	Request for interruption from the shock-proof memory controller.
25	JUMP. PULSE	I	Signal from the track-jump detection circuit. 1 pulse is output every 1 track.
26	CNVSS	—	Mode setting pin at power start-up. Always 0V.
27	RESET	I	Reset input. "H" after several hundred ms of "L" after power start-up.
28, 29	—	I	Not used
30	XIN	I	6 MHz clock input
31	XOUT	O	6 MHz clock output
32	VSS	—	GND
33	ARESET	O	Reset output to the ATRAC encoder/decoder
34, 35	—	I	Not used
36	ALLD	O	APCREP/CONSTANT selection. When CD playback power: "L". When MO playback power: "H".
37	RMS	O	Laser modulation selection. When playback power: "L". When stop: "H". When recording power: 
38	LOADIN	O	Loading control. When LOAD IN: "H"
39	LOADOUT	O	Loading control. When LOAD OUT: "H"
40	PIT/GROOVE	I	PIT/GROOVE detection input. "H": Disc for playing and TOC area
41	C. OUT	I	Track number counting signal input
42	DIRC	O	Output pin for the servo IC during 1 track jump
43	AGCTC	O	AGC time constant selection. "L": Focus searching and power selection
44	DFCTSW	O	Defect ON/OFF selection
45	FOK	I	Focus OK signal input

Pin Name	Signal Name	I/O	Function
46	CD/MO	I	CD/MO discrimination signal input
47	RFSW1	O	Disc mode selection. "H": PIT, "L": GROOVE
48	RFSW0	O	Disc mode selection. "H": High reflection rate disc. "L": Low reflection rate disc.
49	MAGUP	O	Not used
50	MGSERVO	O	Not used
51	—	I	Not used
52	CARTRIG	I	Not used
53	DSCPRO	I	REC-proof detection input. "H": Protect
54	RFLCT	I	Disc reflection rate detection input. "H": Low reflection rate disc
55	LIMITIN	I	Limit in switch input. "L": Sled limit in
56	INSW	I	Loading in switch input. "L" at the position where the head descends. Others: "H"
57	OUTSW	I	Loading out switch input. "L" at the position of load out. Others: "H".
58	SLEN	O	Sled servo ON/OFF control. Normally, the LOCK of Pin 72 is output.
59	FBC	O	Focus bias control
60	MNSB	O	Main/sub-data counter selection to the shock-proof memory controller
61	WRMN	O	Write/monitor mode selection to the shock-proof memory controller
62	INSL		Not used
63	EXEC		Not used
64	MUTE	O	Muting output to the digital filter
65	AMUT	O	Line out muting output
66	DIG/ANA	O	ON/OFF selection of the digital in PLL circuit
67	—	I	Not used
68	GFS	I	Guard frame sync input
69	SORS	I	Not used
70	REC	O	Encoder/decoder mode selection to the shock-proof memory controller and EFM/ACIR encoder/decoder "H": Encoder mode
71	SCTX	O	Writing data transmission timing output. Used together with the magnetic field head ON/OFF output.
72	LOCK	I	Spindle lock detection input
73	VCC	—	+5V
74	VREF	—	Maximum output voltage input pin of the 12-pin APCREF
75	AVSS	—	Analog GND
76	CHACK. IN	I	Chucking in switch input. When chucking: "L"
77, 78	—	I	Not used
79	ASY. DISEN	O	Asymmetry ON/OFF control. Other than disc data input: "H"
80	LDON	O	Laser ON/OFF control. When the laser is ON: "H"

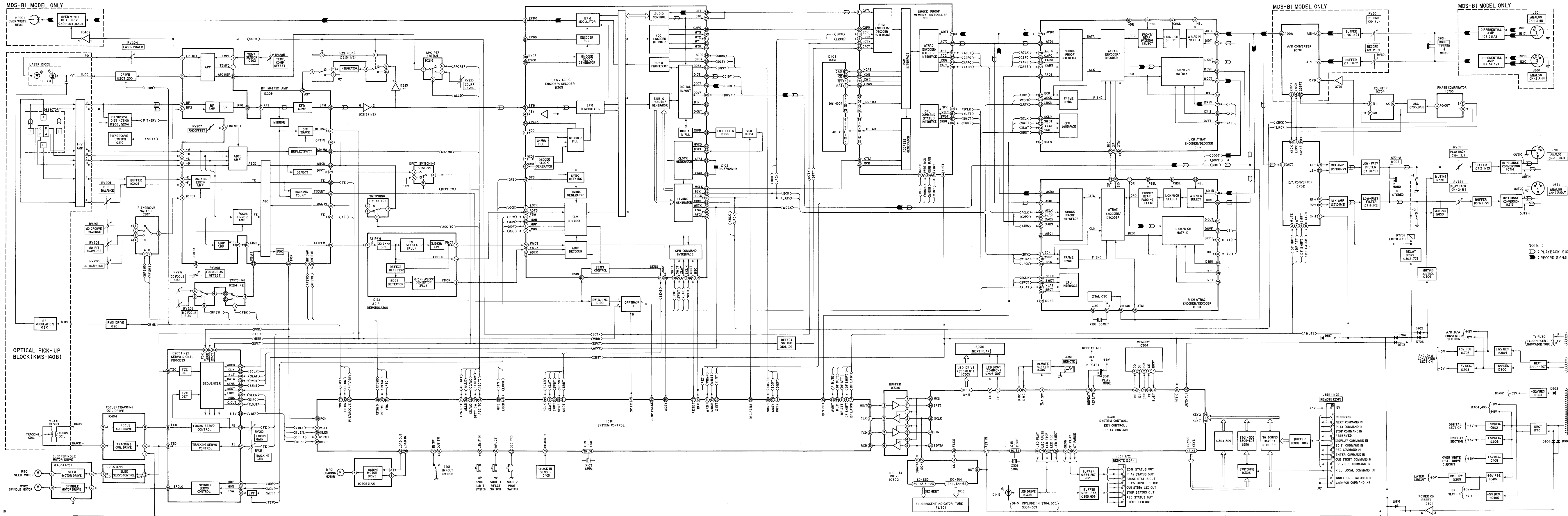
IC301 MASTER MICROPROCESSOR (M38004E8-SP-B1-1)

Pin Name	Signal Name	I/O	Function
1	VCC	—	Power supply terminal (+5V).
2, 3	LE1, LE2	O	Scan signal output to LED301.
4 to 10	G to A	O	Segment signal output to LED301.
11	$\bar{S}/A$	O	Remote/AU bus select output. Fixed at “L”.
12	232C	I	Not used.
13	232ON	I	Not used.
14, 15	RMC	I	Remote control signal input.
16	232 WAIT	I	Not used.
17	232 INT	I	Not used.
18	TWR	I	Not used.
19	TCS	I	Not used.
20	MCS	O	Chip select signal to the mechanism microprocessor.
21	SCLK	O	Serial clock output.
22	SDATA	O	Serial data output.
23	SIN	I	Serial data input.
24	SRST	I	Wait signal input from the mechanism microprocessor.
25	—	I	Not used. Fixed at “L”.
26	VSS	—	Ground terminal.
27	RST IN	I	Reset signal input.
28	—	I	Not used. Fixed at “L”.
29	FLCS	O	Chip select signal to the IC302.
30	XIN	I	X’tal input.
31	XOUT	O	X’tal output.
32	VSS	—	Ground terminal.
33	RST O	O	System reset signal output.
34	—	I	Not used. Fixed at “L”.
35	SEOM	O	EOM status output.
36	LED EJECT	O	EJECT LED drive output.
37	LED REC	O	REC LED drive output.
38	LED STOP	O	STOP LED drive output.
39	LED CUE STANDBY	O	CUE STANDBY LED drive output.
40	LED PLAY	O	PLAY LED drive output.
41	R & P/P	I	Record and Playback model, Playback only model select. “H”: MDS-B1 MODEL, “L”: MDS-B2P MODEL.
42 to 44	TEST1 to TEST3	I	Test terminal. Fixed at “L”.
45	—	I	Not used. Fixed at “L”.
46	AUTO CUE	O	Muting output for auto cue.
47, 48	KEYS1, KEYS0	O	Key scan output.
49 to 54	KEY7 to KEY2	I	Key scan input.
55	ST PAUSE	O	Status pause output.

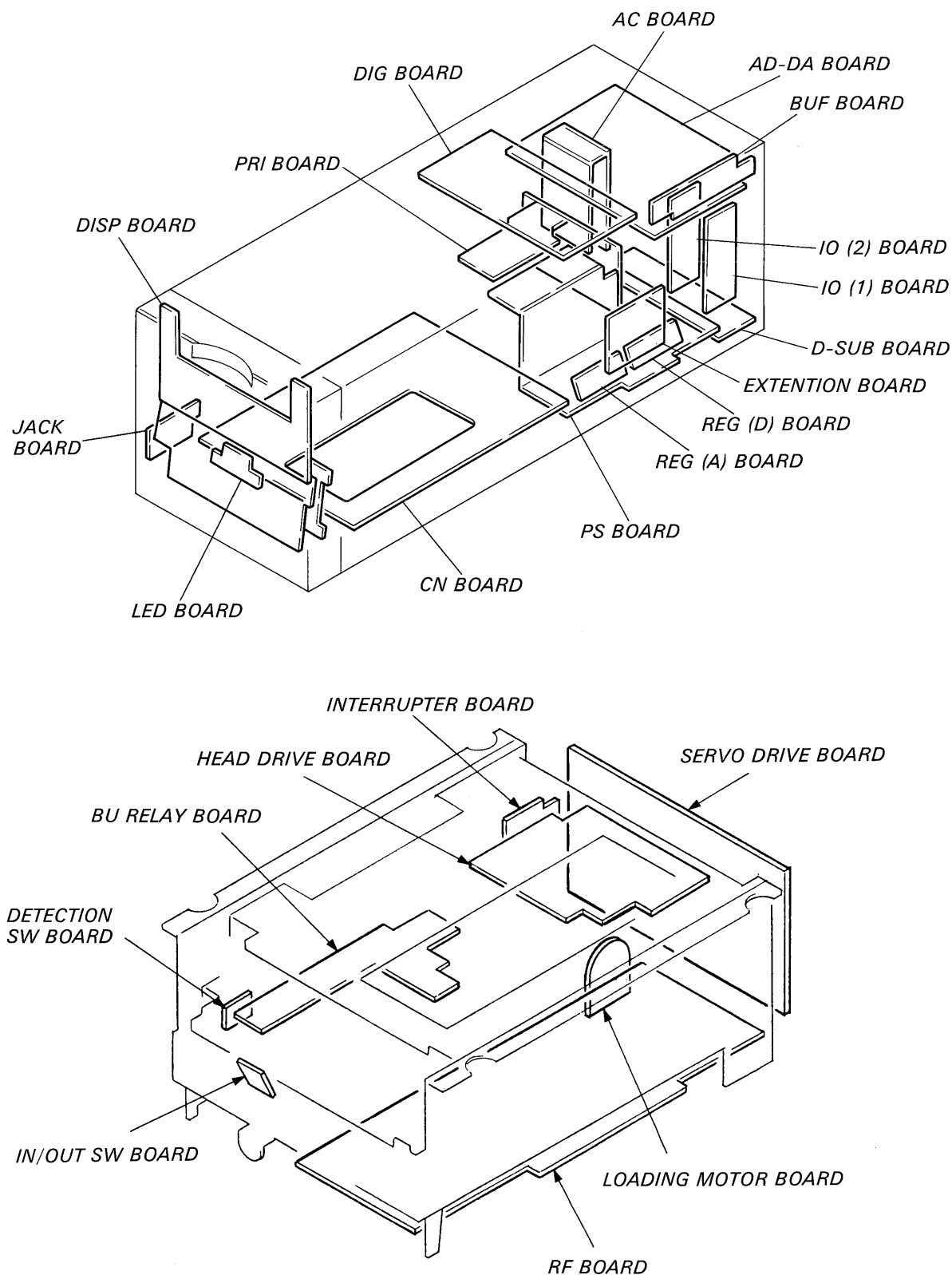
Pin Name	Signal Name	I/O	Function
56	ST PLAY	O	Status play output.
57	DO	O	Data output to EEP ROM (IC304).
58	DI	I	Data input from EEP ROM (IC304).
59	SCK	O	Clock signal output to EEP ROM (IC304).
60	CE	O	Chip enable signal output to EEP ROM (IC304).
61	BUSY	I	Busy signal input from EEP ROM (IC304).
62	REPEAT	I	Repeat mode select signal input. “H”: Repeat all mode.
63	REPEAT1	I	Repeat mode select signal input. “H”: Repeat 1 mode.
64	—	I	Not used. Fixed at “L”.

SECTION 6
DIAGRAMS

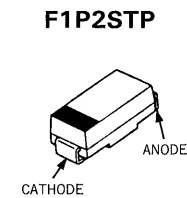
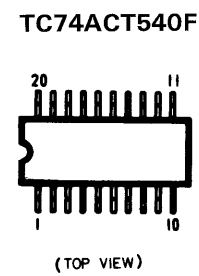
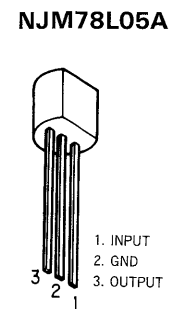
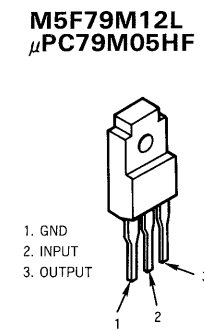
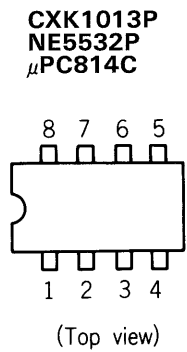
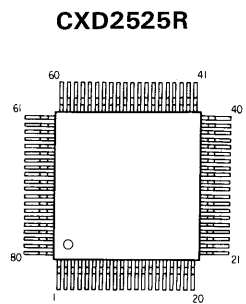
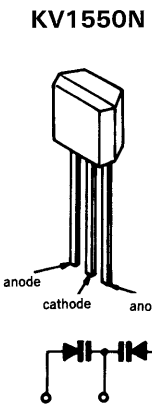
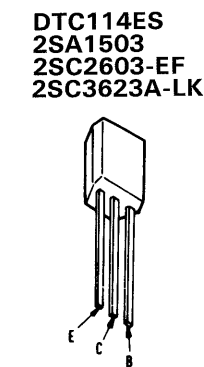
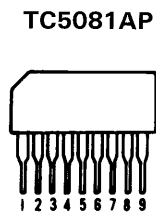
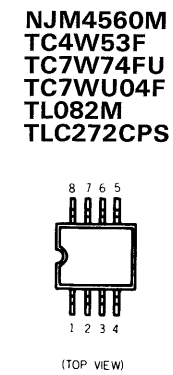
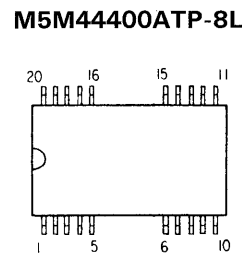
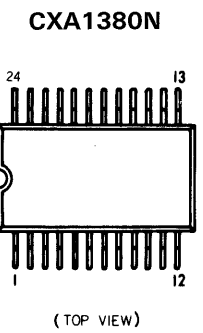
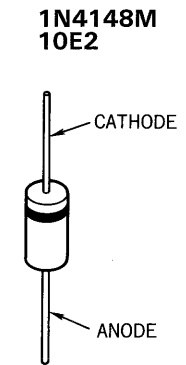
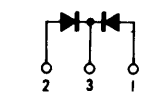
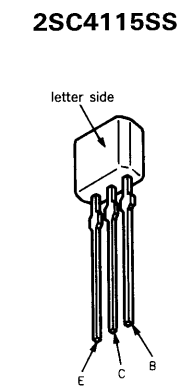
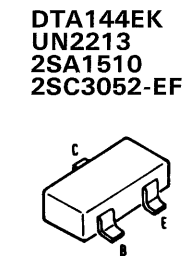
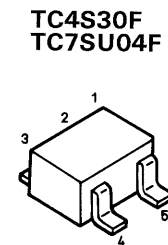
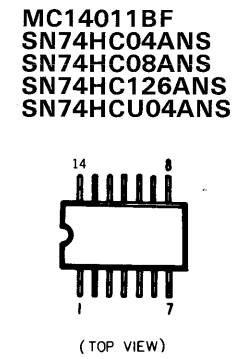
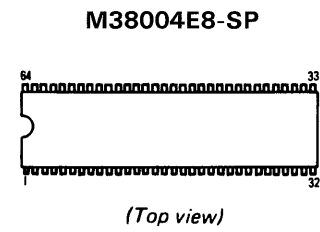
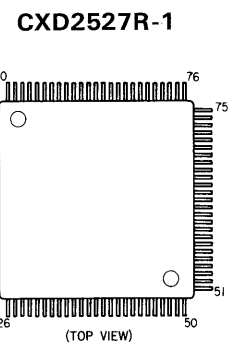
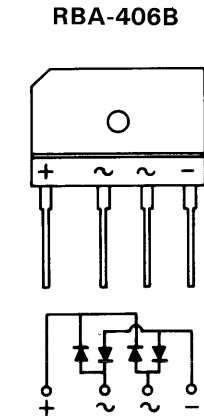
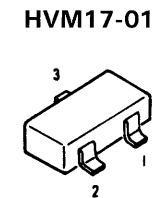
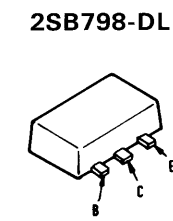
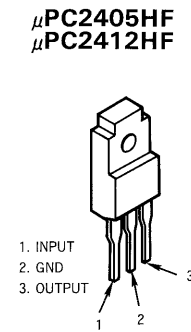
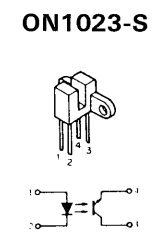
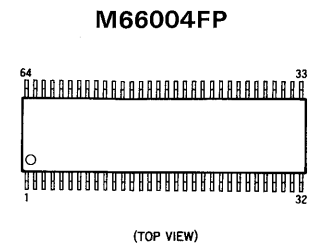
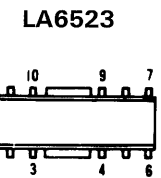
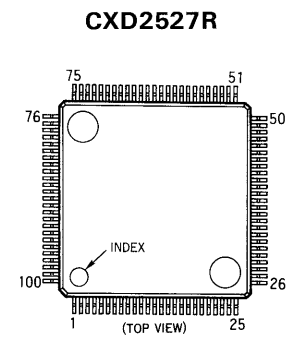
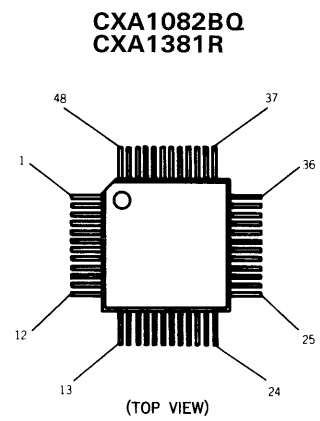
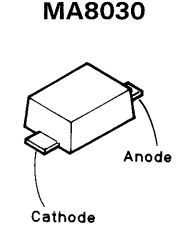
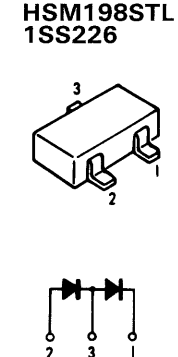
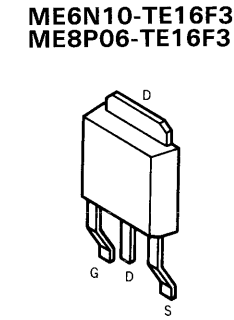
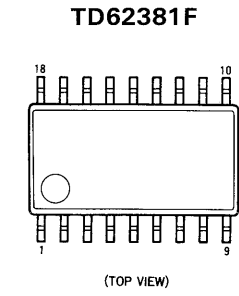
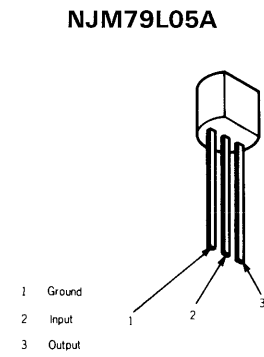
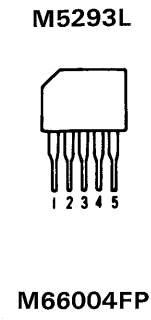
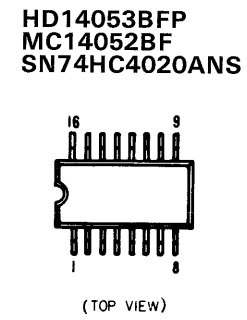
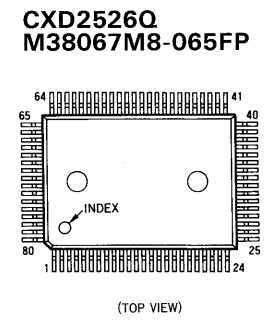
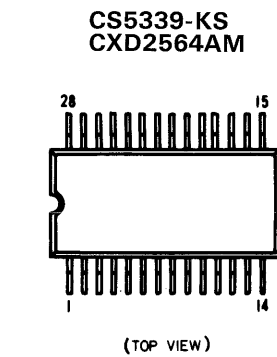
6-1. BLOCK DIAGRAM



6-2. CIRCUIT BOARDS LOCATION



6-3. SEMICONDUCTOR LEAD LAYOUTS

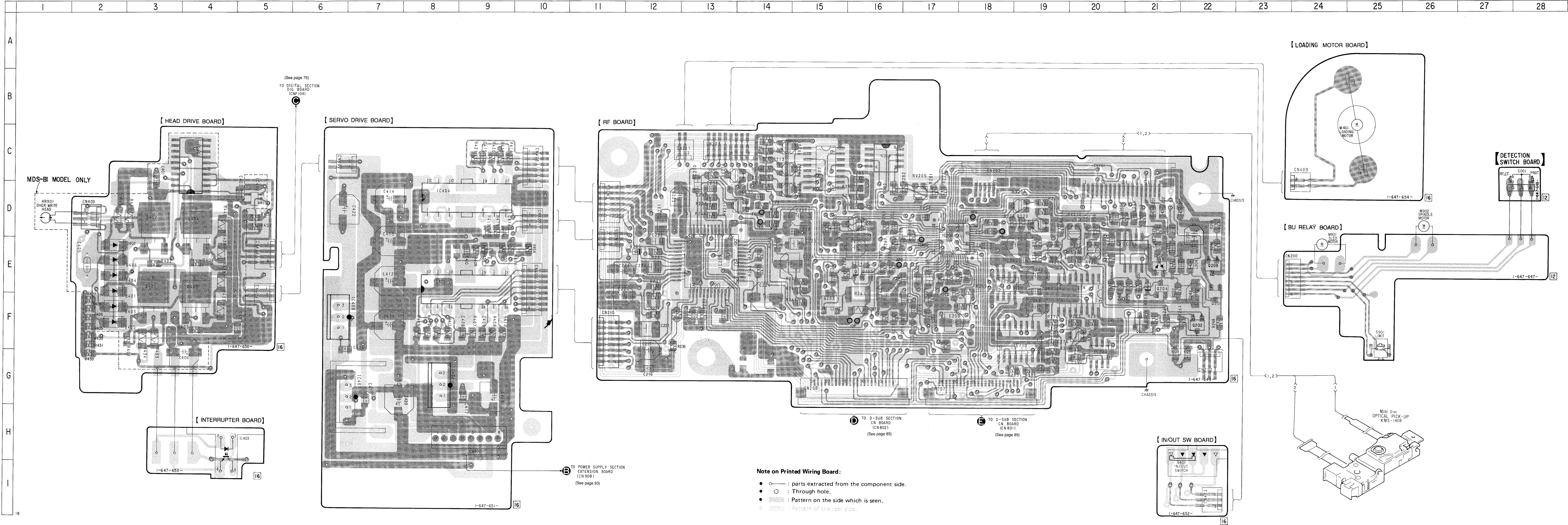


6-4. PRINTED WIRING BOARDS —RF Section— ●See page 60–62 for Semiconductor Lead Layouts.

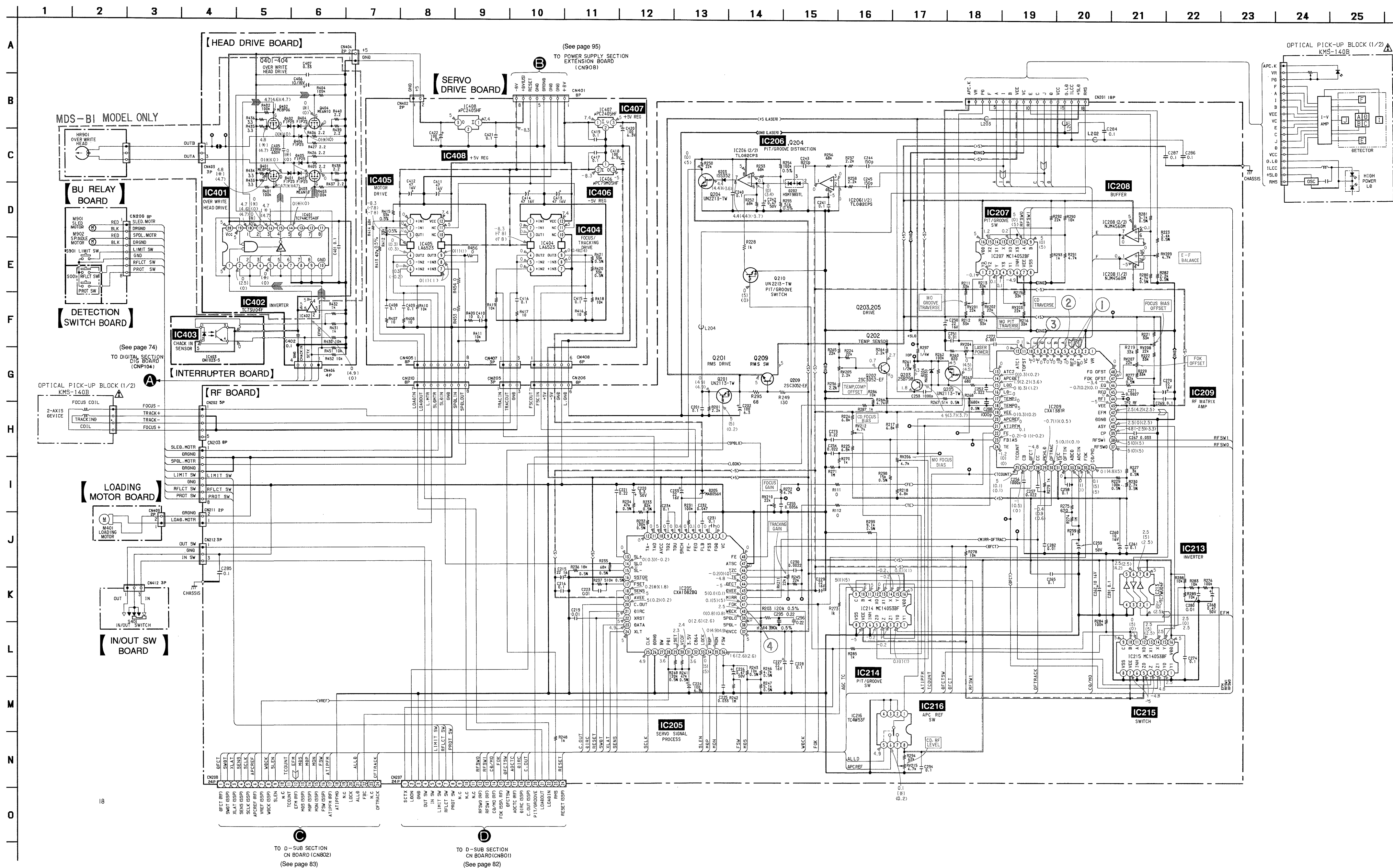
● Semiconductor Location

Ref. No.	Location
D202	E-21
D203	F-21
D204	E-16
D205	E-12
○D401	F-3
○D402	E-3
○D403	F-3
○D404	E-3
○D405	F-3
○D406	E-3
IC205	E-13
IC206	E-21
IC207	C-15
IC208	C-16
IC209	E-17
IC213	E-18
IC214	E-20
IC215	F-19
IC216	G-20
○IC401	C-4
○IC402	D-5
IC403	H-5
IC404	D-8
IC405	E-8
IC406	G-8
IC407	G-7
IC408	E-7
Q201	F-22
Q202	F-22
Q203	F-15
Q204	E-21
Q205	E-16
Q209	E-22
Q210	F-21
○Q401	E-3
○Q402	D-3
○Q403	E-4
○Q404	D-4

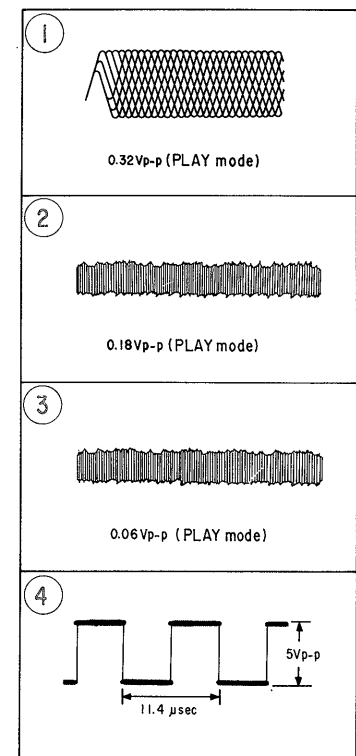
○: MDS-B1 MODEL ONLY



6-5. SCHEMATIC DIAGRAM —RF Section— ●See page 97—99 for IC Block Diagrams.



•Waveforms



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{2}\text{W}$ or less unless otherwise specified.
- % : indicates tolerance.

Note:

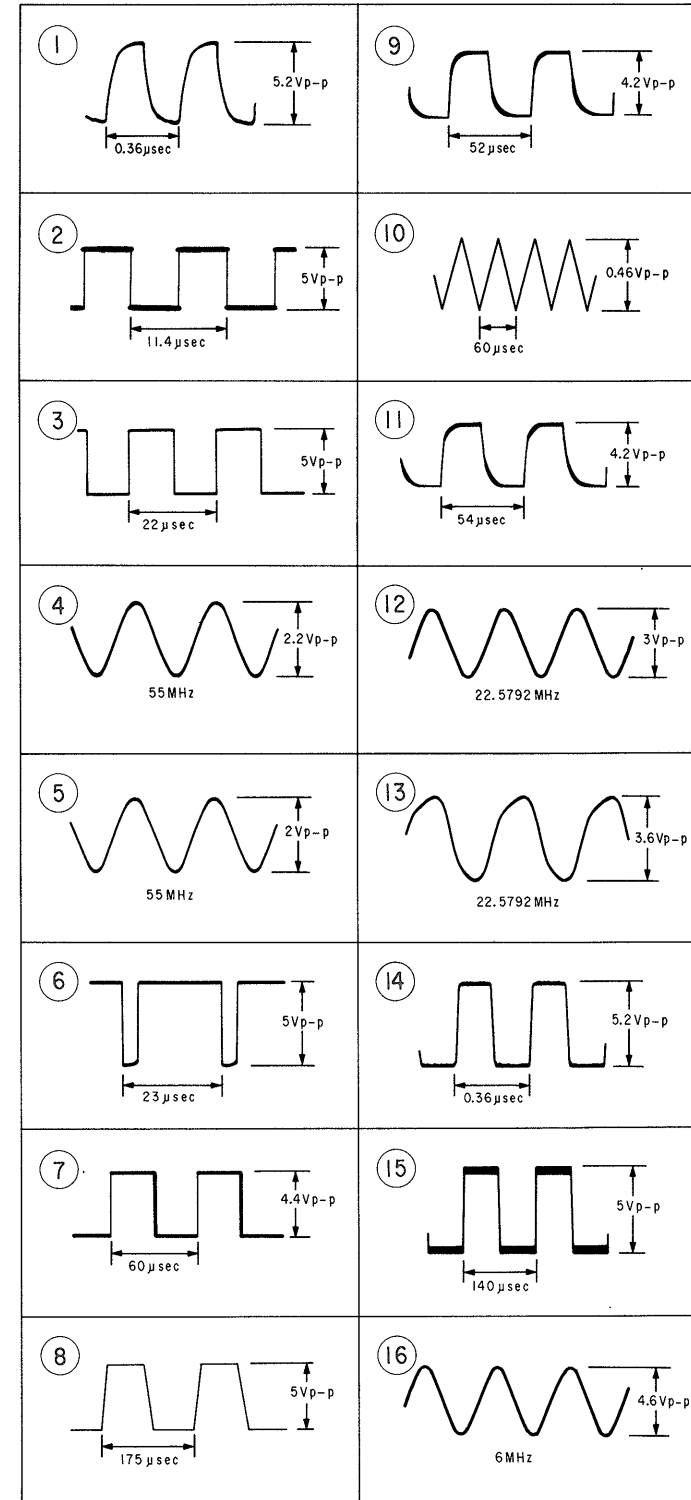
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Note:

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

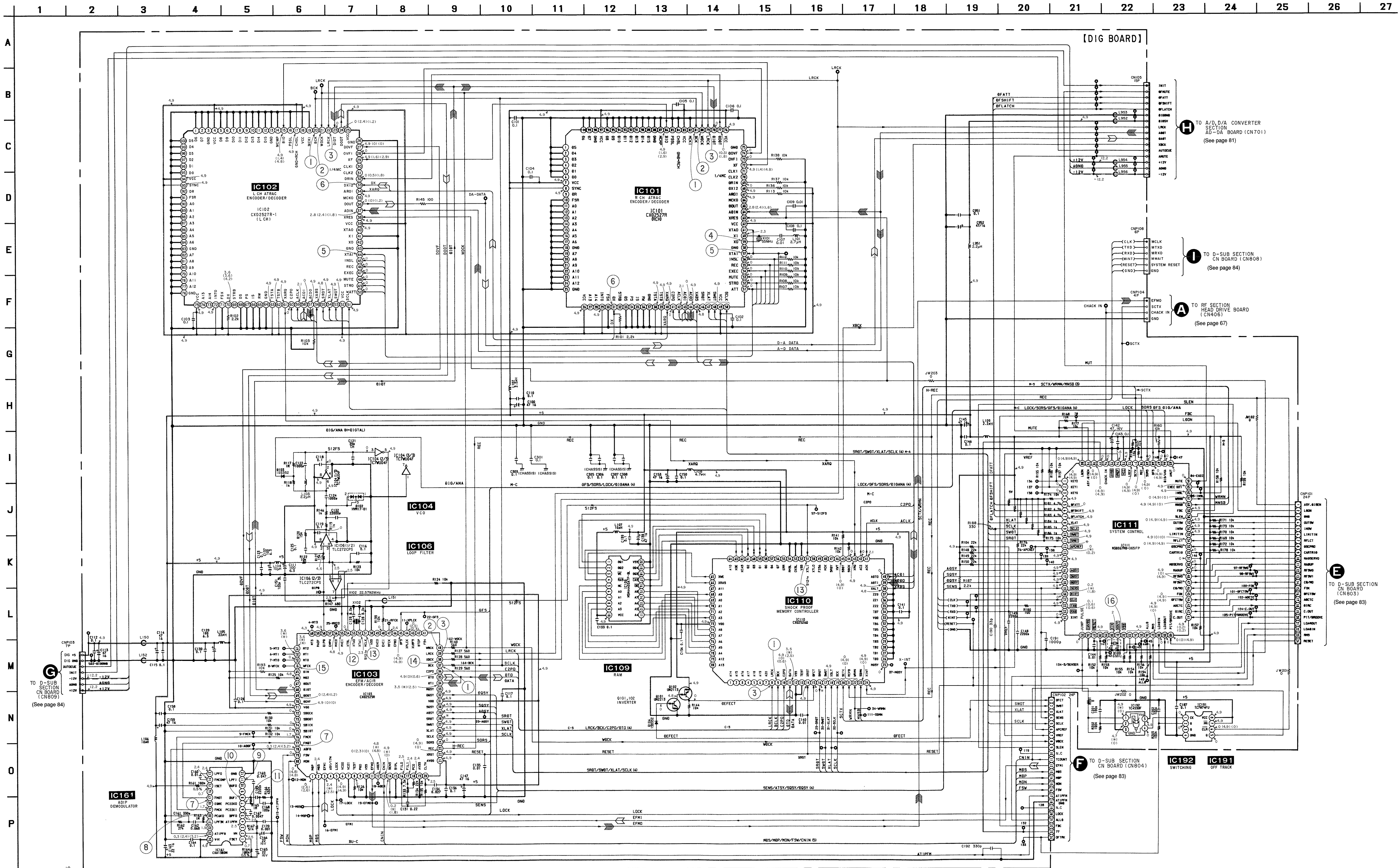
- B+ Line
- B- Line
- adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: STOP
- (): RECORD
- < : PLAYBACK
- X : Impossible to measure the voltage at the marked points.
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- PLAYBACK
- RECORD (MDS-B1 MODEL ONLY)

•Waveforms

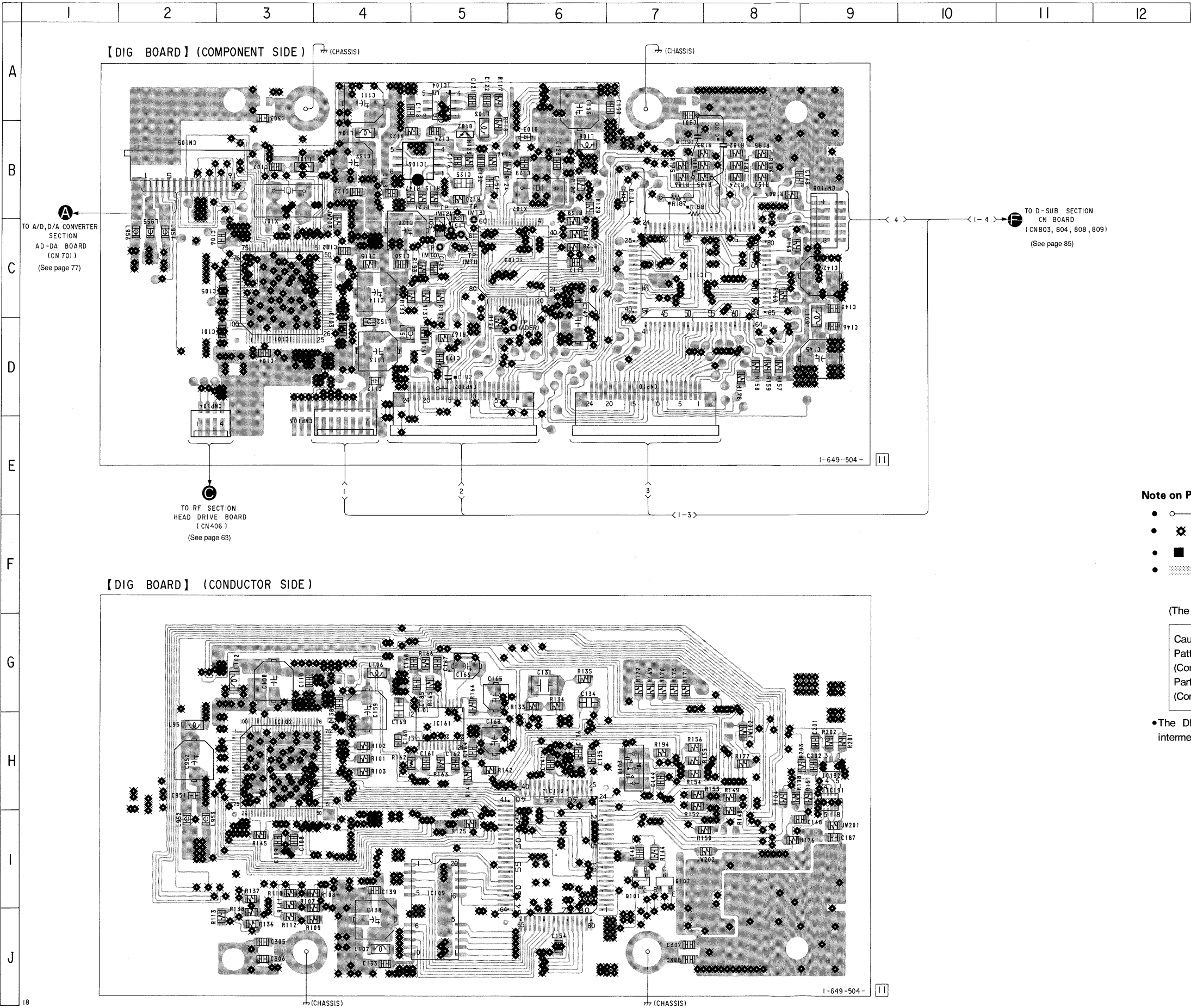


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- % : indicates tolerance.
- $\triangle$: internal component.
- --- : B+ Line
- --- : B- Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark : STOP
- () : RECORD
- < > : PLAYBACK
- $\times$: Impossible to measure the voltage at the marked points.
- Voltages are taken with a VOM (input impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- --- : PLAYBACK
- --- : RECORD (MDS-B1 MODEL ONLY)



6-7. PRINTED WIRING BOARD —DIGITAL Section— ●See page 60–62 for Semiconductor Lead Layouts.



● Semiconductor Location

Ref. No.	Location
D102	B-5
D103	B-6
D104	B-7
IC101	D-3
IC102	H-3
IC103	C-6
IC104	A-5
IC106	B-5
IC109	I-5
IC110	H-6
IC111	C-7
IC161	H-5
IC191	H-9
IC192	H-9
Q101	I-7
Q102	I-7

Note on Printed Wiring Board:

- : parts extracted from the component side.
- ✱ : Through hole.
- : Parts mounted on the conductor side.
- ▨ : Pattern from the side

which enables seeing.

(The other layers' patterns are not indicated.)

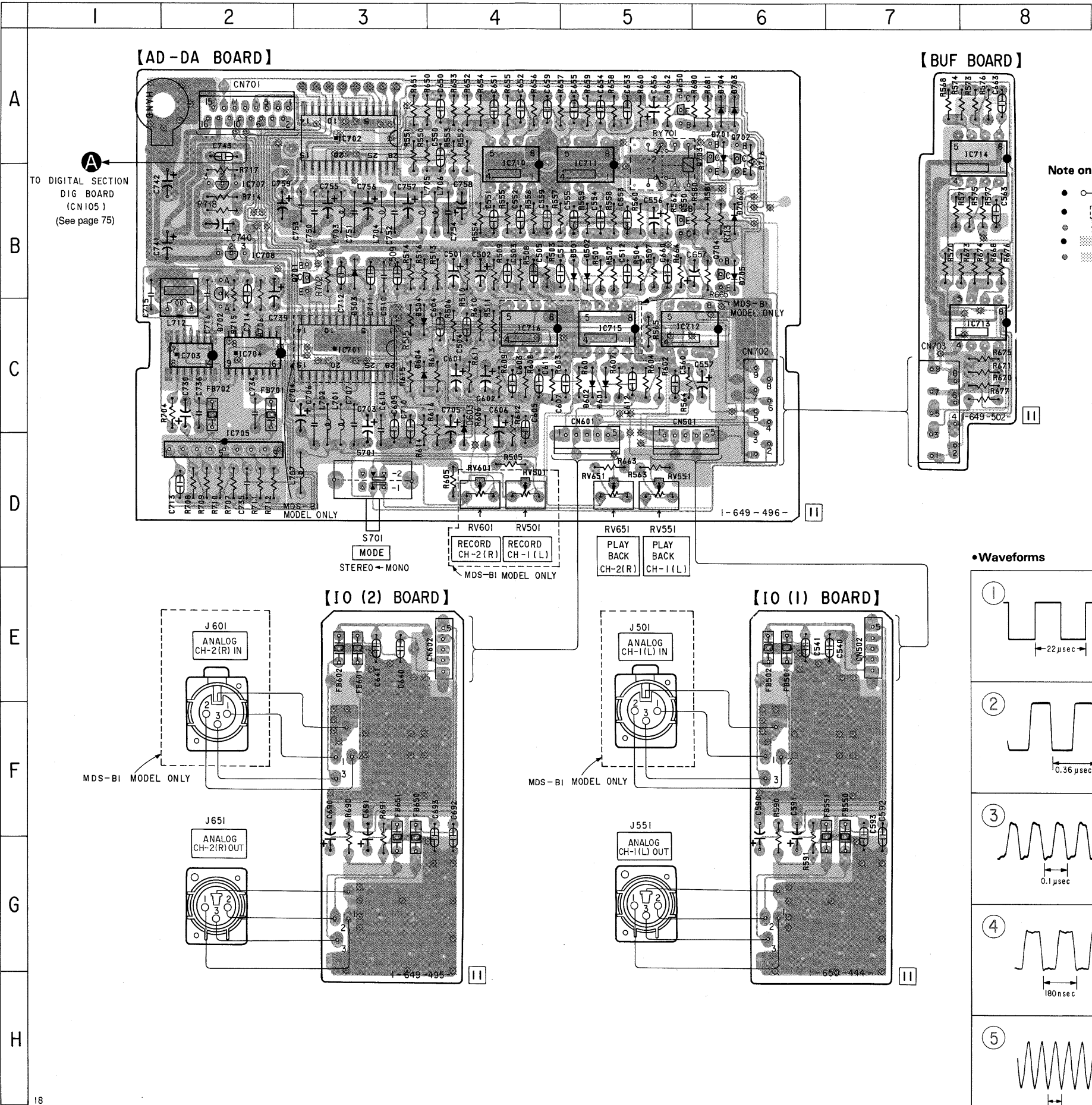
Caution:
Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: Parts on the parts face side seen from the parts face are indicated.

●The DIG. board is of 4-layers structure, but the patterns of intermediate layers (second and third layers) are not shown.

● Semiconductor Location

Ref. No.	Location
D501	B-5
D502	B-5
D503	C-3
D504	C-3
D601	C-5
D602	C-5
D603	C-4
D604	C-3
D701	A-6
D702	C-2
D703	A-6
D704	A-6
D705	B-6
D706	B-6
○ IC701	C-3
IC702	A-3
IC703	C-2
IC704	C-2
IC705	D-2
IC707	B-2
IC708	B-2
IC710	A-4
IC711	A-5
IC712	C-5
IC713	C-8
IC714	A-8
○ IC715	C-5
○ IC716	C-4
Q550	B-5
Q650	A-5
Q701	B-3
Q702	A-6
Q703	A-6
Q704	B-6

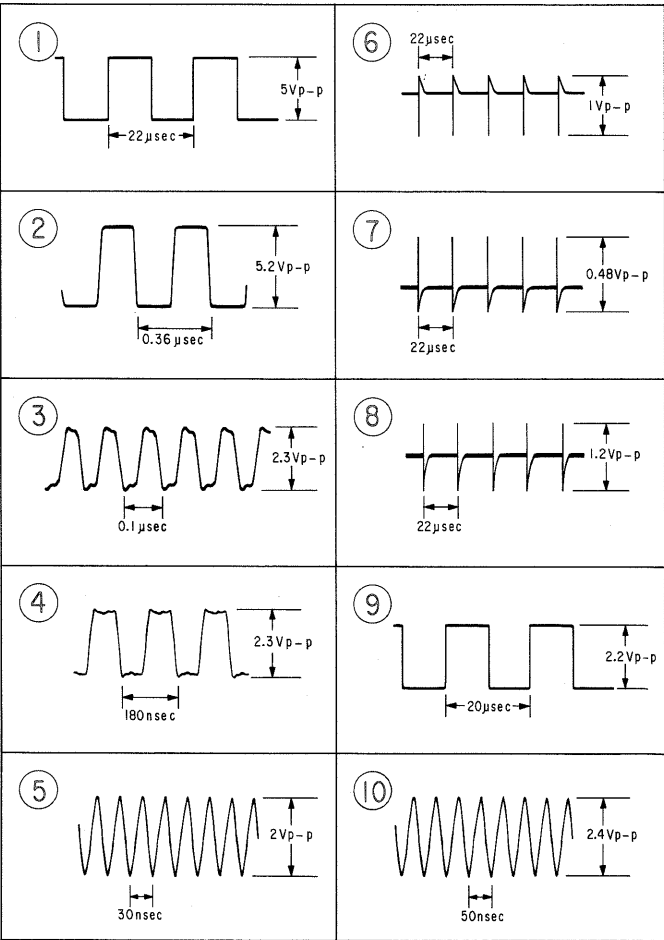
○ : MDS-B1 MODEL ONLY



Note on Printed Wiring Board:

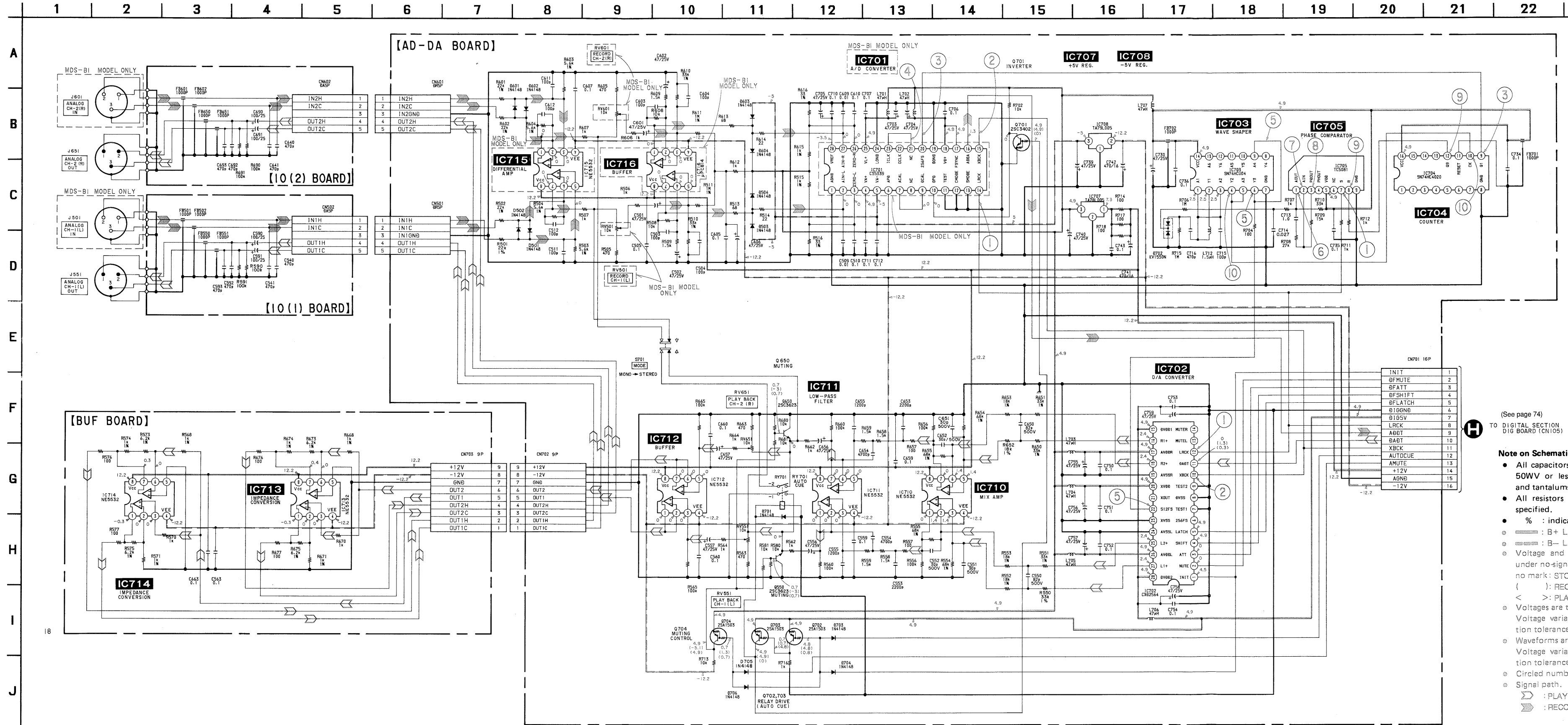
- : parts extracted from the component side.
- : indicates side identified with part number.
- ⊗ : Through hole.
- ⊙ : Pattern on the side which is seen.
- ⊙ : Pattern of the rear side.

● Waveforms



6-9. SCHEMATIC DIAGRAM —A/D, D/A CONVERTER Section—

● See page 97-99 for IC Block Diagrams.

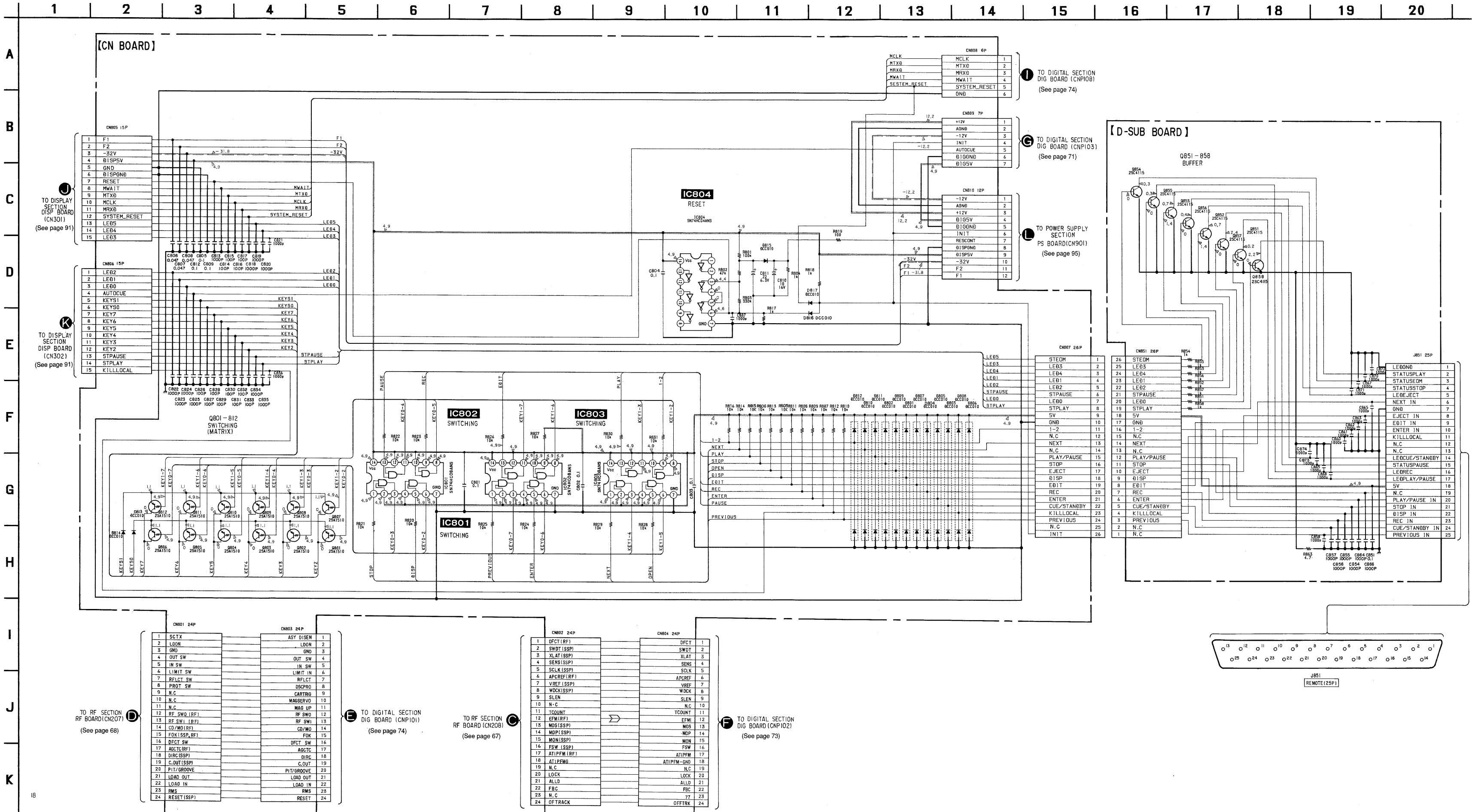


(See page 74)
TO DIGITAL SECTION
DIG BOARD (CN105)

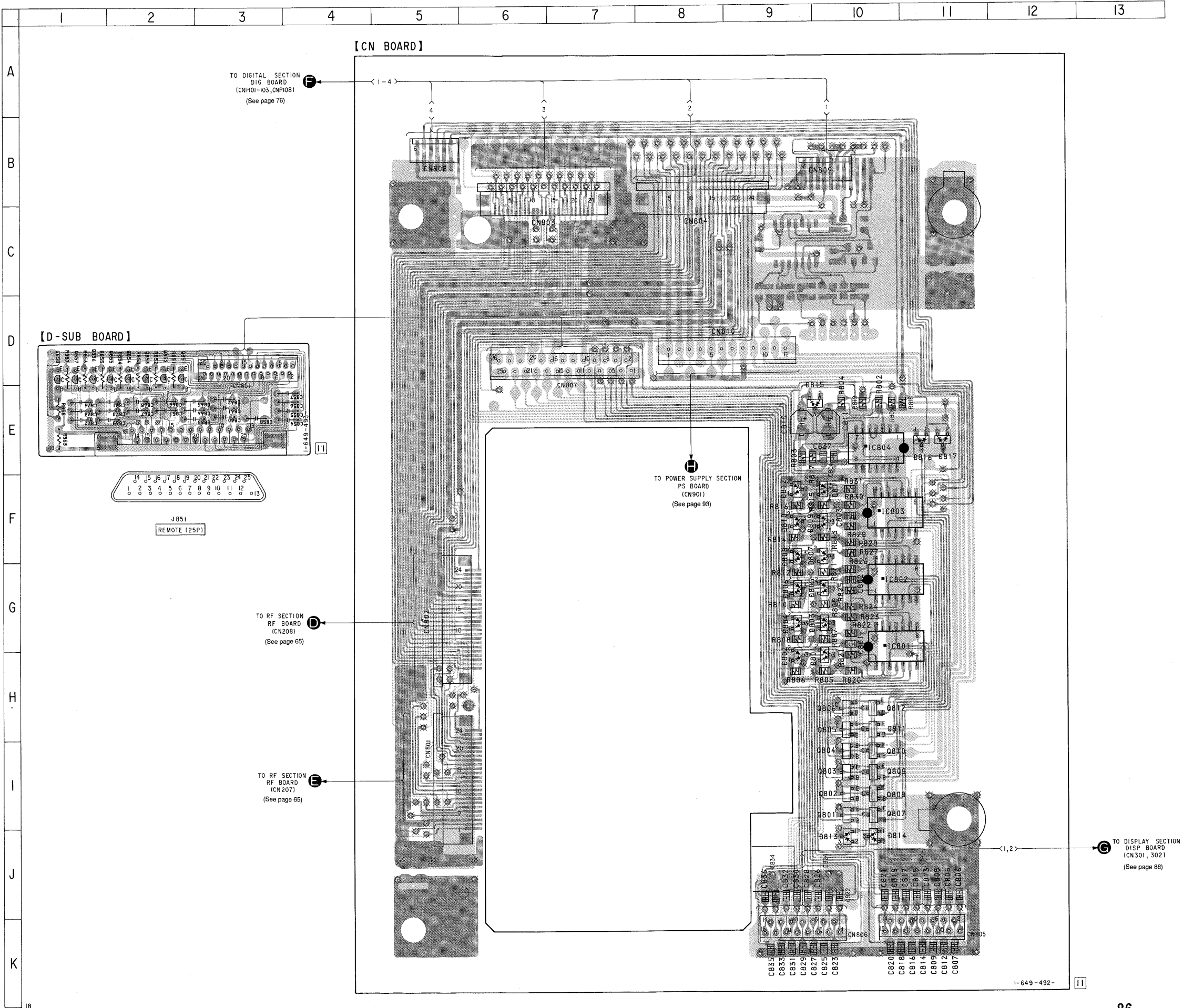
- Note on Schematic Diagram:**
- All capacitors are in μF unless otherwise noted. pF : μpF
 - 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 - % : indicates tolerance.
 - — : B+ Line
 - — : B- Line
 - Voltage and waveforms are dc with respect to ground under no-signal conditions.
 - no mark : STOP
 - () : RECORD
 - < > : PLAYBACK
 - Voltages are taken with a VOM (Input Impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
 - Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
 - Circled numbers refer to waveforms.
 - Signal path.
 - — : PLAYBACK
 - — : RECORD (MDS-B1 MODEL ONLY)

Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- : B+ Line
- : B- Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark: STOP
- Voltages are taken with a VOM (input Impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- : PLAYBACK



6-11. PRINTED WIRING BOARDS —D—SUB Section— ●See page 60–62 for Semiconductor Lead Layouts.



● Semiconductor Location

Ref. No.	Location
D801	H-9
D802	H-9
D803	G-9
D804	G-9
D805	G-9
D806	G-9
D807	F-9
D808	F-9
D809	F-9
D810	F-9
D811	F-10
D812	F-9
D813	J-10
D814	J-10
D815	E-10
D816	E-11
D817	E-11
IC801	G-10
IC802	G-10
IC803	F-10
IC804	E-10
Q801	I-10
Q802	I-10
Q803	I-10
Q804	I-10
Q805	H-10
Q806	H-10
Q807	I-10
Q808	I-10
Q809	I-10
Q810	I-10
Q811	H-10
Q812	H-10
Q851	D-2
Q852	D-2
Q853	D-2
Q854	D-2
Q855	D-1
Q856	D-1
Q857	D-1
Q858	D-1

Note on Printed Wiring Board:

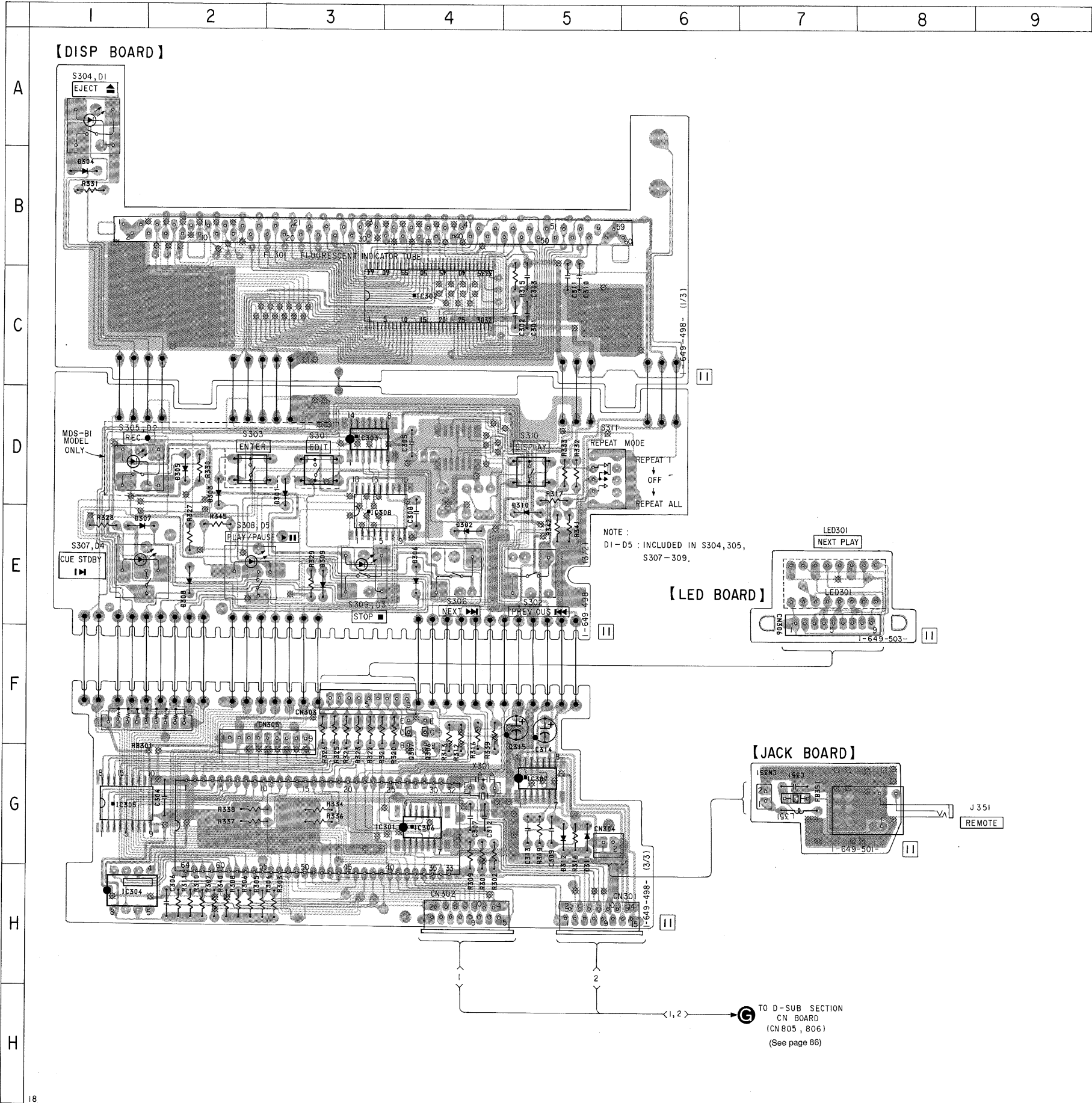
- : parts extracted from the component side.
- ⊗ : Through hole.
- : Pattern on the side which is seen.
- ⊙ : Pattern of the rear side.

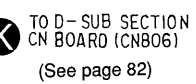
• Semiconductor Location

Ref. No.	Location
D301	D-3
D302	E-4
D303	D-2
D304	B-1
D305	D-2
D306	E-4
D307	E-1
D308	E-2
D309	E-3
D310	E-5
D311	G-5
D312	G-5
IC301	G-3
IC302	C-4
IC303	D-3
IC304	H-1
IC305	G-1
IC306	G-4
IC307	G-5
IC308	E-3
LED301	E-7
Q306	F-4
Q307	F-4

Note on Printed Wiring Board:

- : parts extracted from the component side.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ⊙ : Pattern of the rear side.





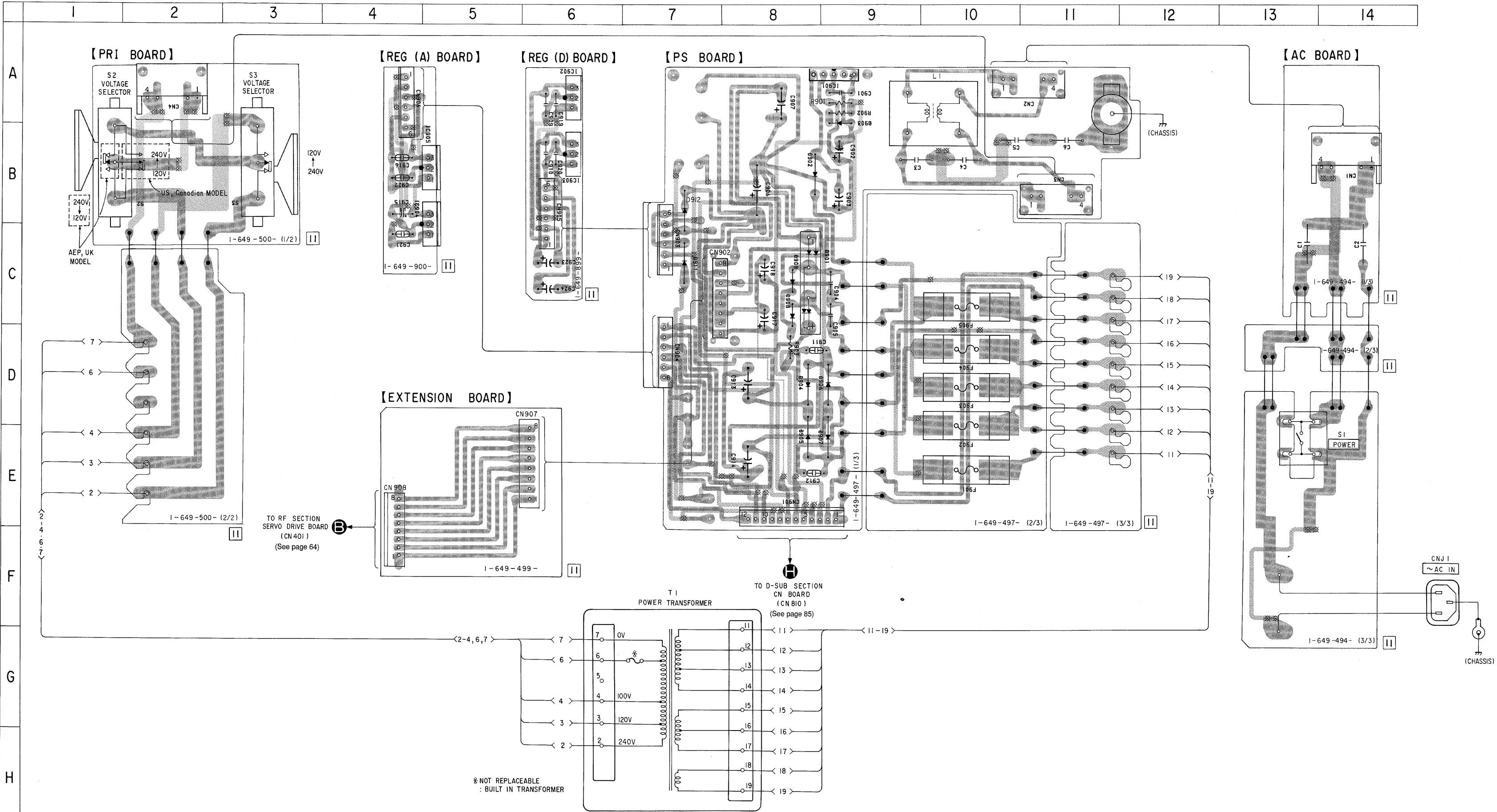
6-14. PRINTED WIRING BOARDS —POWER SUPPLY Section— ●See page 60-62 for Semiconductor Lead Layouts.

● Semiconductor Location

Ref. No.	Location
D901	C-9
D902	B-8
D903	A-9
D904	D-8
D905	E-8
D906	D-9
D907	E-9
D908	C-8
D909	C-8
D911	C-7
D912	B-7
IC901	A-9
IC902	A-6
IC903	B-6
IC904	B-4
IC905	B-5

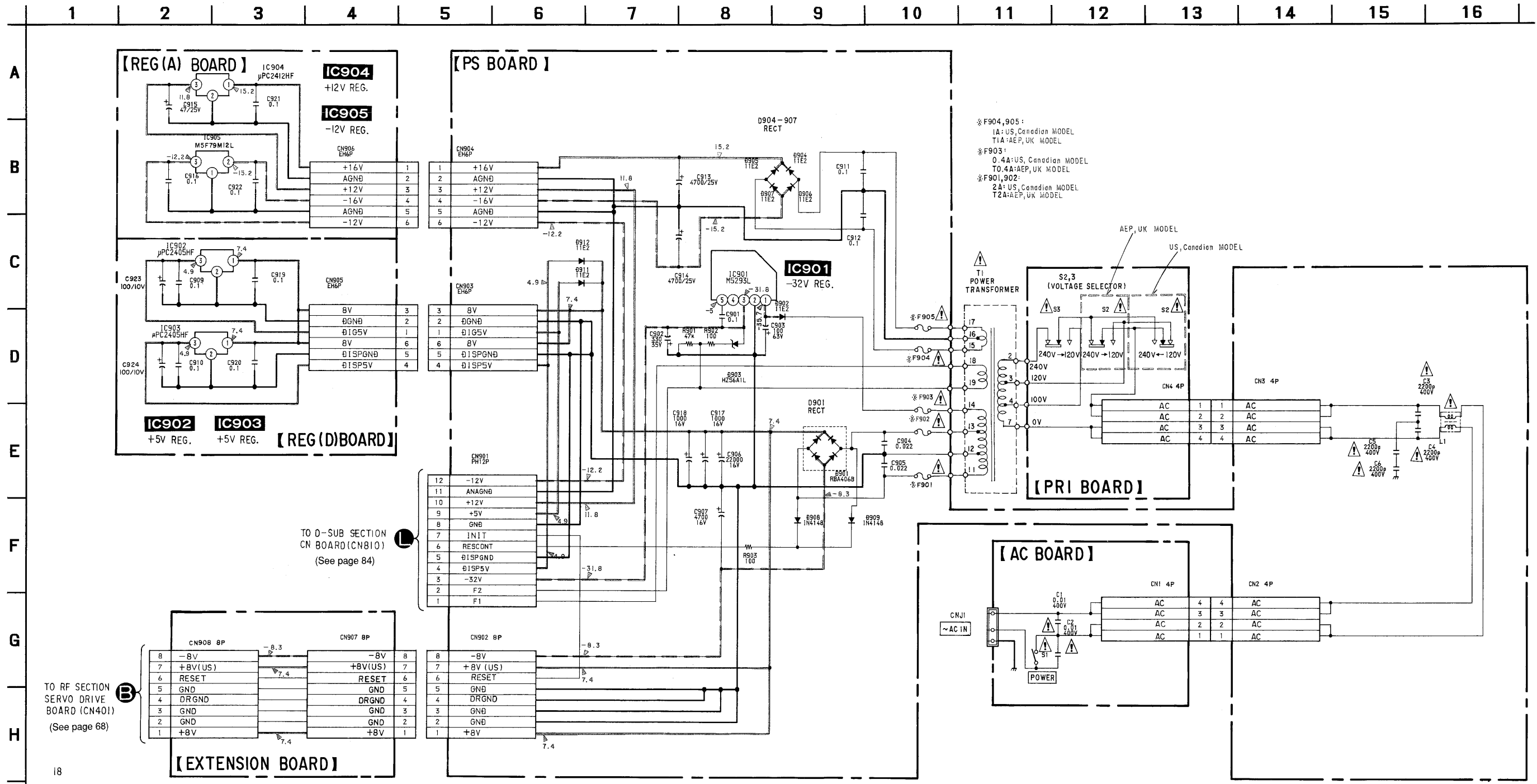
Note on Printed Wiring Board:

- : parts extracted from the component side.
- ⊗ : Through hole.
- ⊙ : Pattern on the side which is seen.
- ⊖ : Pattern of the rear side.



6-15. SCHEMATIC DIAGRAM —POWER SUPPLY Section—

● See page 97–99 for IC Block Diagrams.



Note on Schematic Diagram:

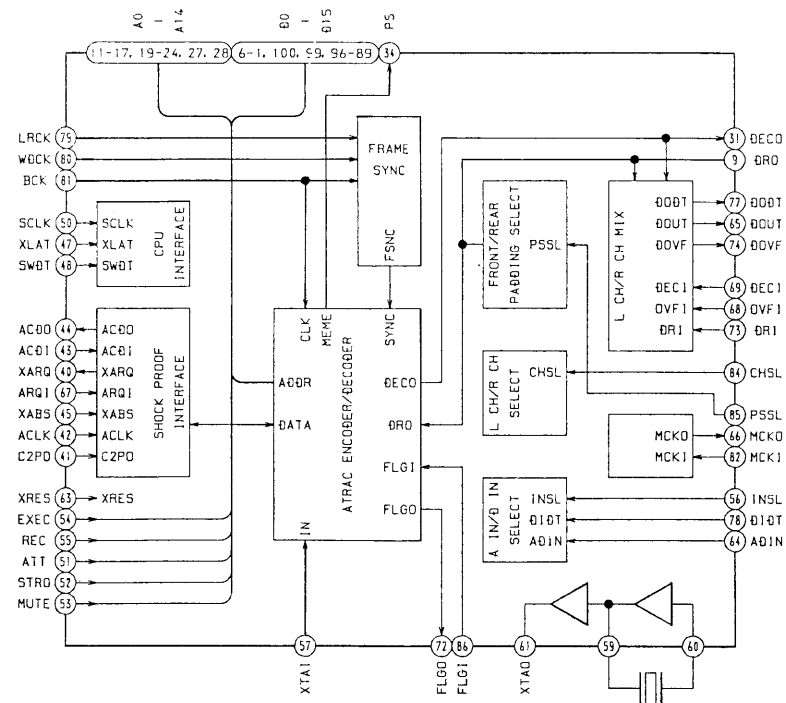
- All capacitors are in μ F unless otherwise noted. pF: μ F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}$ W or less unless otherwise specified.

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

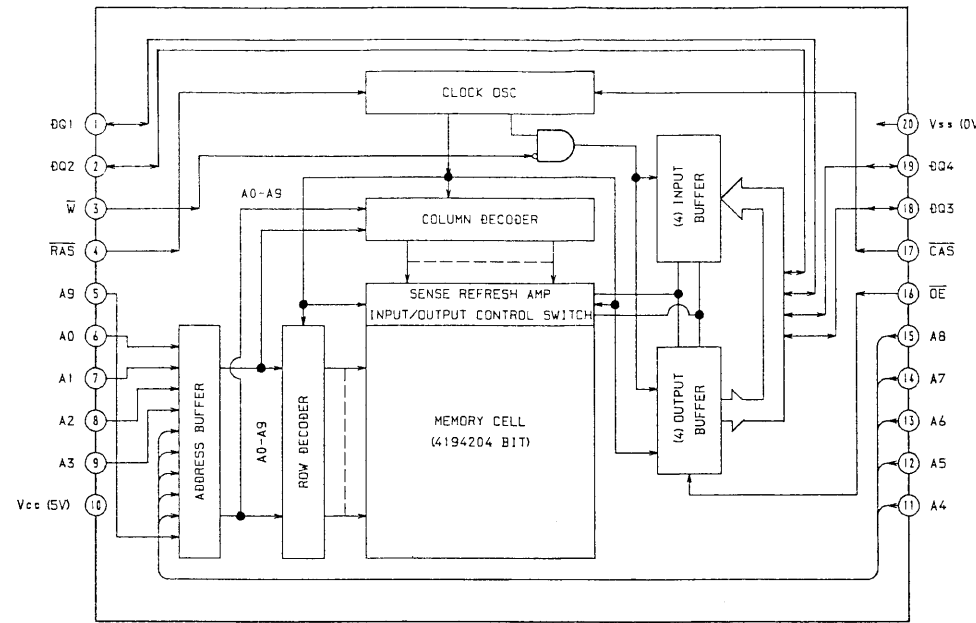
Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-16. IC BLOCK DIAGRAMS

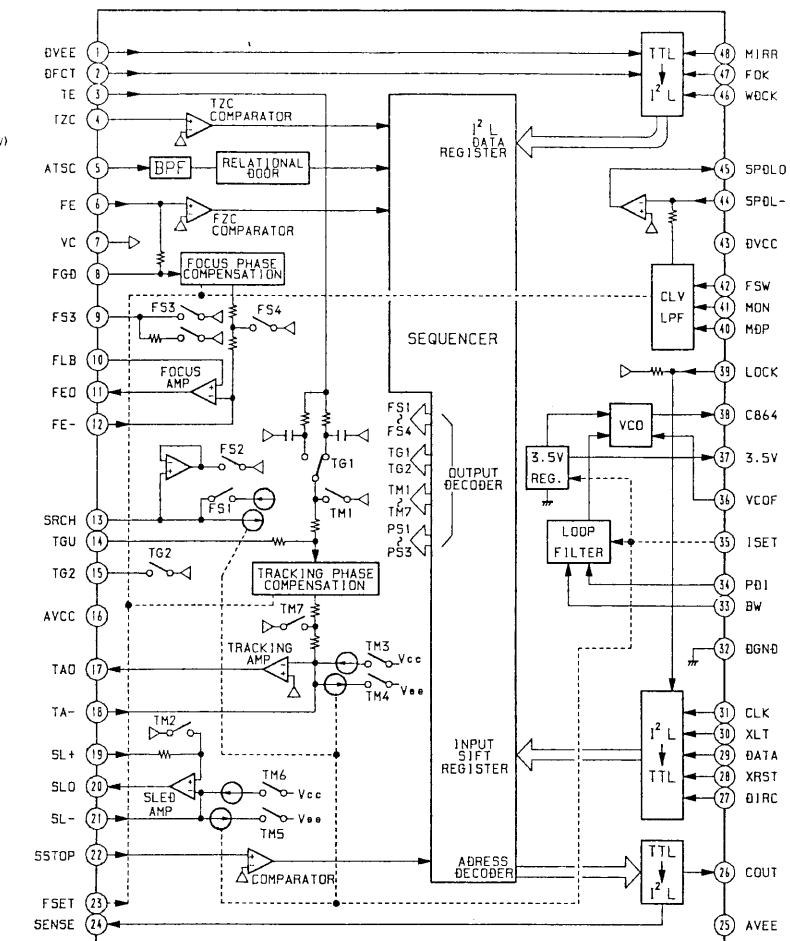
IC101 CXD2527R



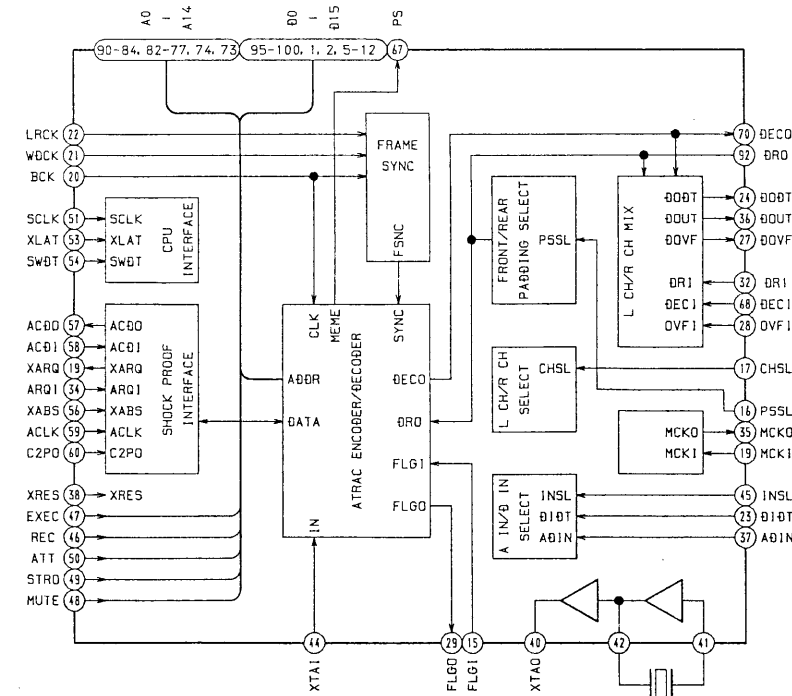
IC109 M5M44400ATP-8L



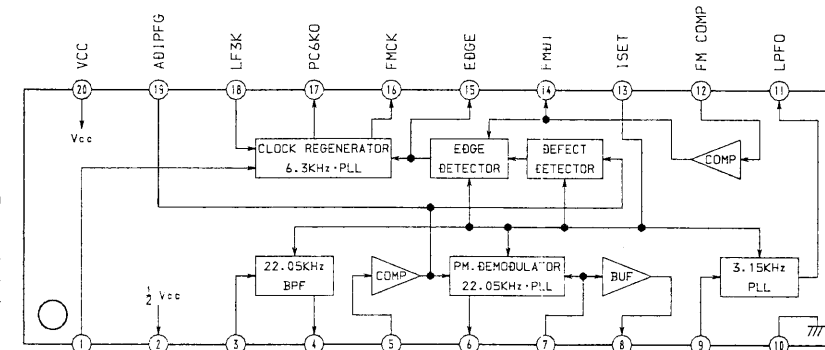
IC205 CXA1082BQ



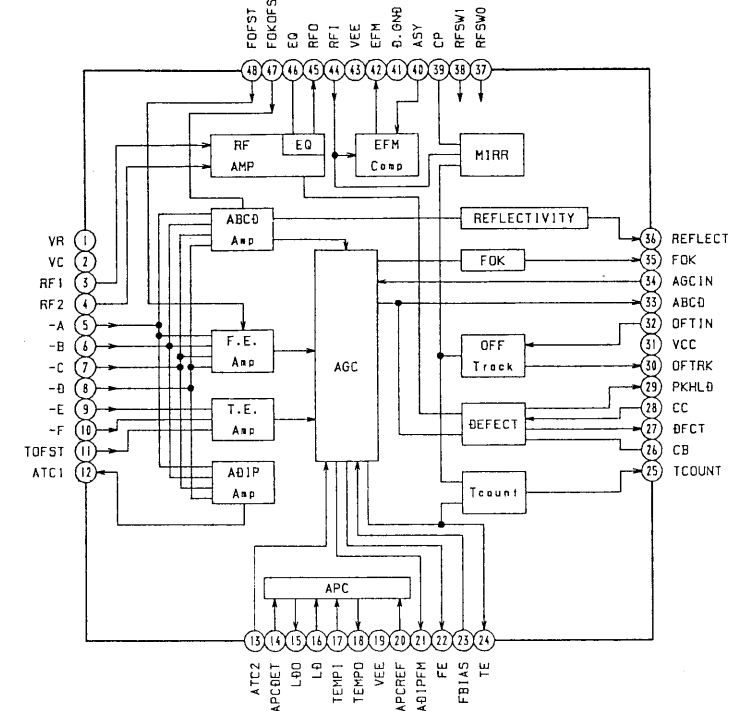
IC202 CXD2527R-1



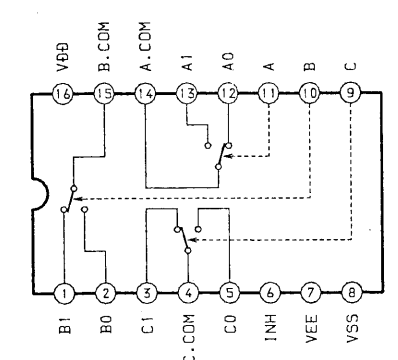
IC161 CXA1380N



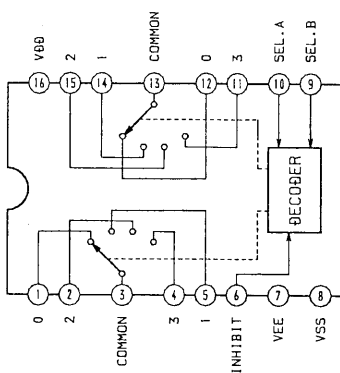
IC209 CXA1381R



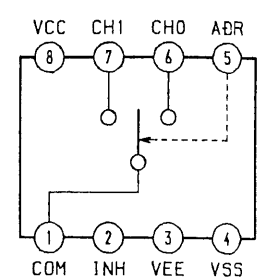
IC214, 215 MC14053BF



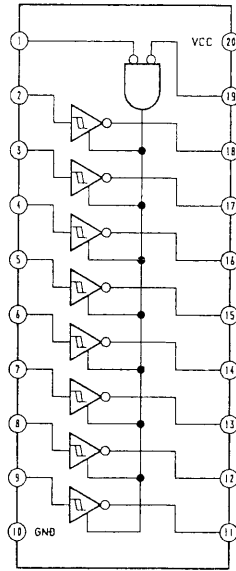
IC207 MC14052BF



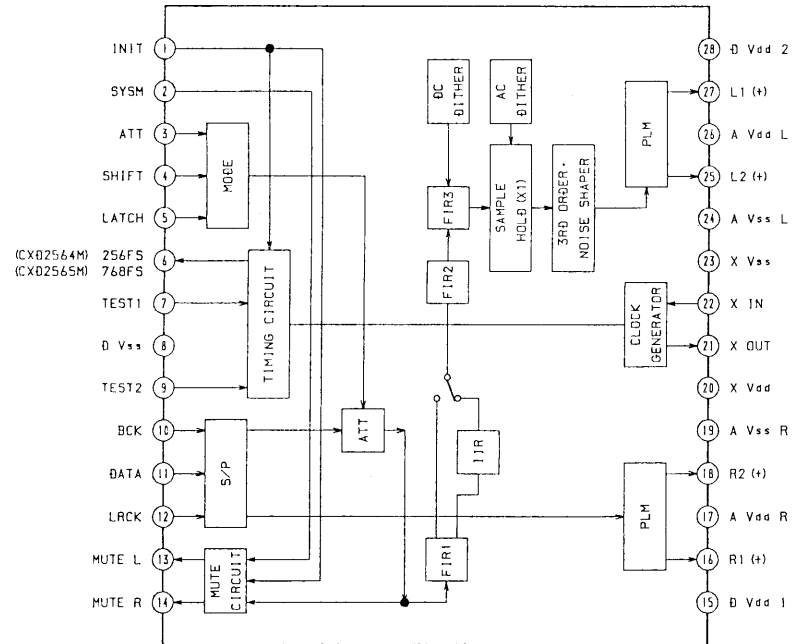
IC216 TCW53F



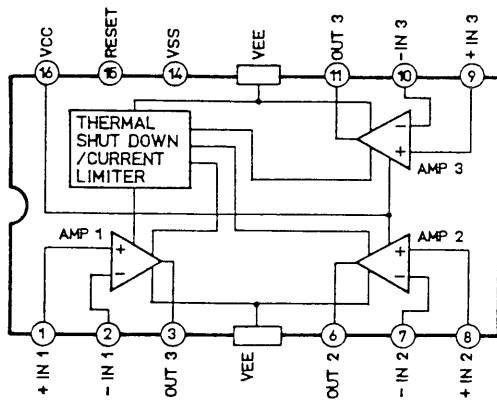
**IC401 TC74ATC540F
(MDS-B1 MODEL ONLY)**



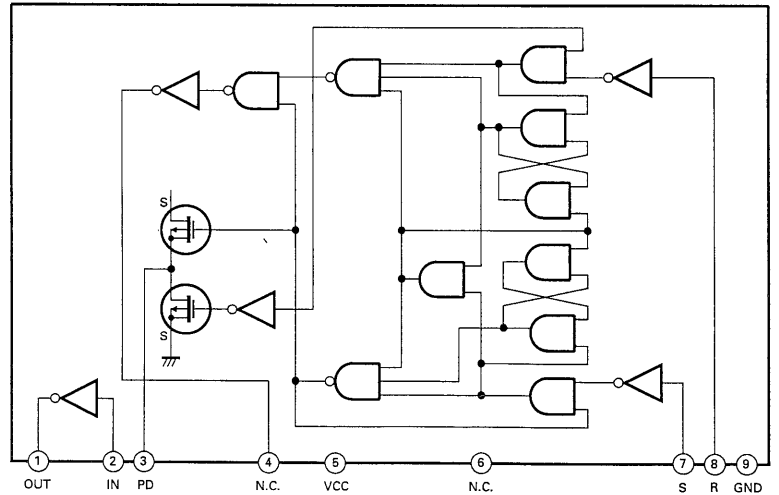
IC702 CXD2564AM



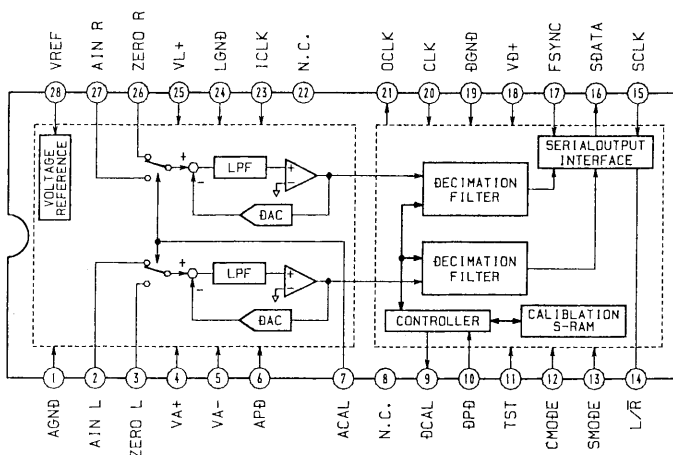
IC404, 405 LA6523



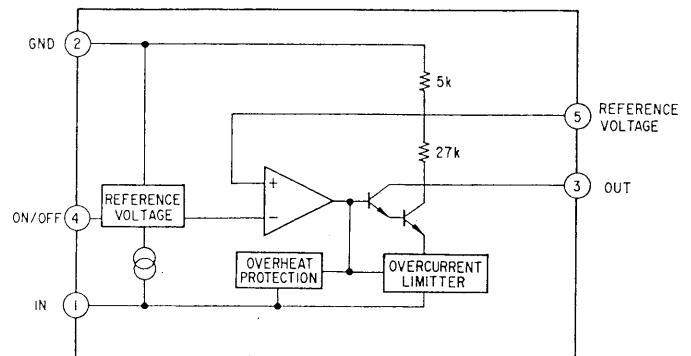
IC705 TC5081AP



**IC701 CS5339-KS
(MDS-B1 MODEL ONLY)**



IC901 M5293L



SECTION 7 EXPLODED VIEWS

NOTE:

- -xx,-x mean standardized parts, so they may have some differences from the original one.

- Color Indication of Appearance Parts

Example:

KNOB, BALANCE (WHITE)...(RED)

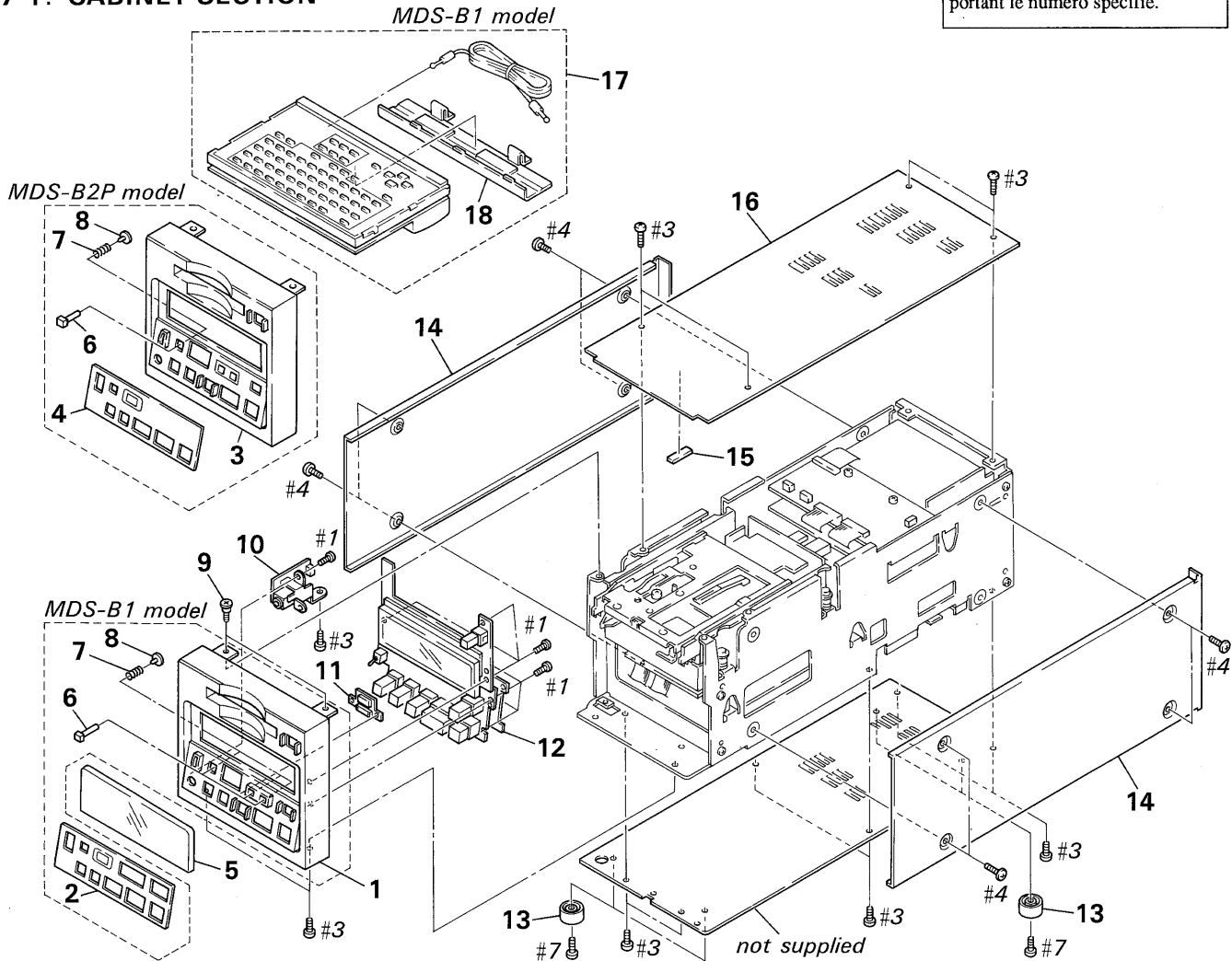
↑
↑
 Parts color Cabinet's color

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

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

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

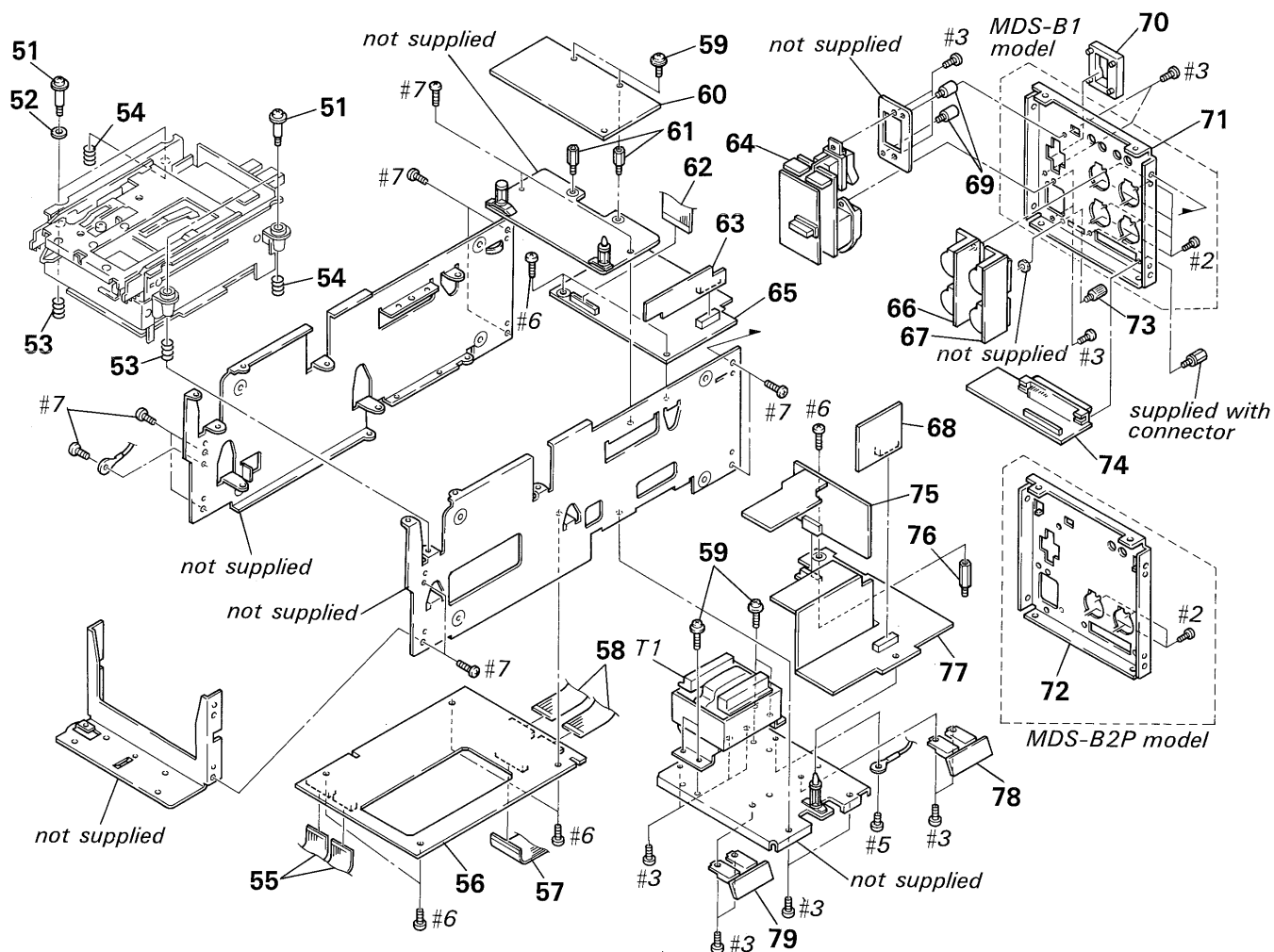
7-1. CABINET SECTION



Ref.No.	Part No.	Description	Remark
1	X-3367-219-2	PANEL ASSY, FRONT (MDS-B1)	
2	3-906-063-01	SHEET (MDS-B1)	
3	X-3367-220-2	PANEL ASSY, FRONT (MDS-B2P)	
4	3-906-063-11	SHEET (MDS-B2P)	
5	3-906-064-01	WINDOW (FL TUBE)	
6	3-906-065-01	BUTTON	
*7	3-567-099-00	SPRING, COMPRESSION	
8	3-668-009-02	PIN, PUSH BUTTON	
9	2-236-956-00	SCREW, STEP	
*10	1-649-501-11	JACK BOARD	

Ref.No.	Part No.	Description	Remark
*11	1-649-503-11	LED BOARD	
*12	A-4649-827-A	DISP BOARD, COMPLETE (MDS-B1)	
*12	A-4649-841-A	DISP BOARD, COMPLETE (MDS-B2P)	
13	4-927-849-01	FOOT	
*14	4-936-675-22	PLATE (R), SIDE	
*15	4-911-041-01	CUSHION, RUBBER	
*16	3-906-060-01	CASE	
17	1-467-284-11	REMOTE COMMANDER	
18	4-395-504-01	LID, BATTERY (REMOTE COMMANDER)	

7-2. CHASSIS SECTION



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

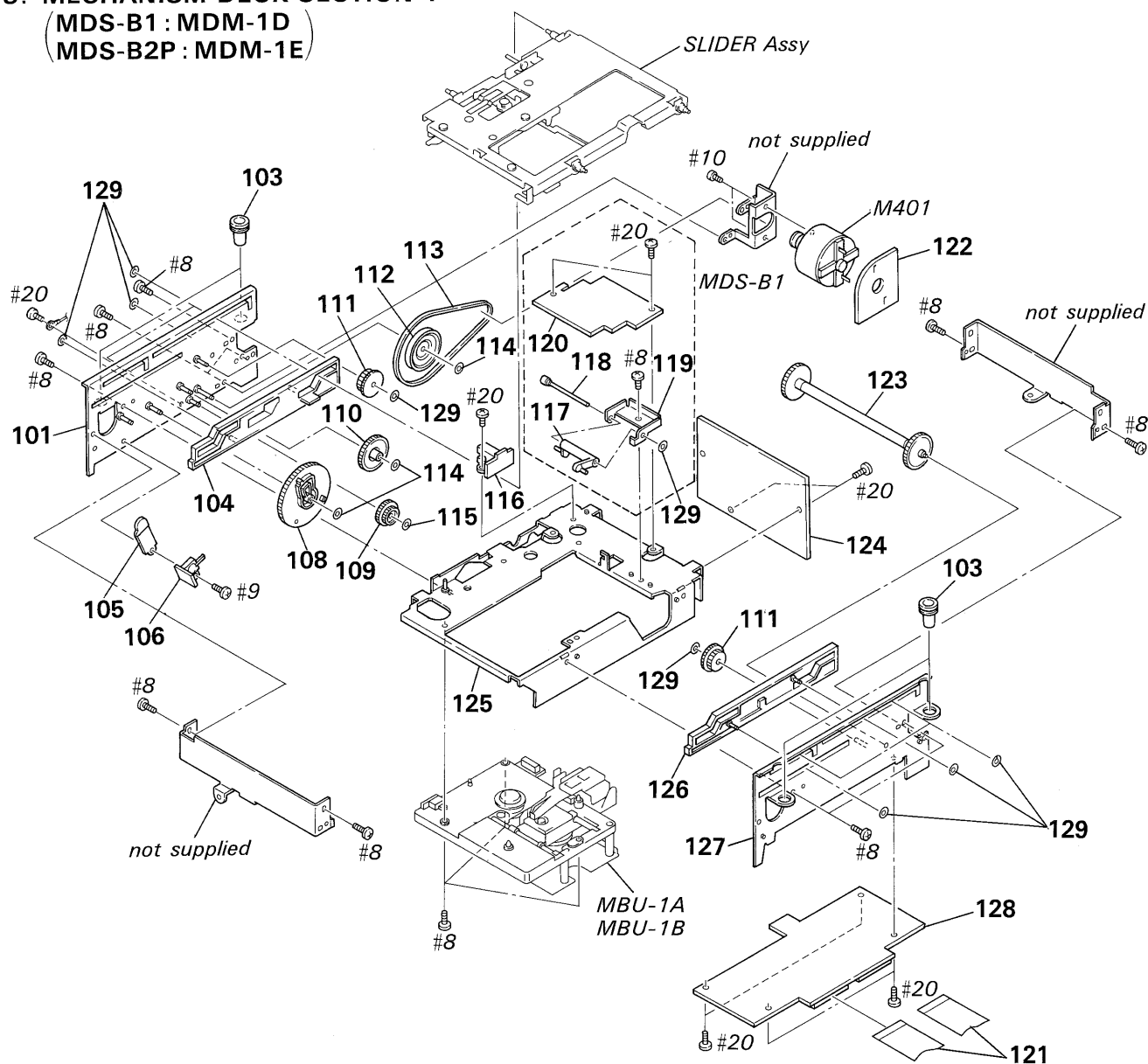
Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
51	3-372-531-01	SCREW (C), TRANSPORT	
52	4-958-120-01	BUSHING (DAMPER)	
*53	4-958-087-02	SPRING (FRONT), COMPRESSION	
*54	4-958-088-02	SPRING (REAR), COMPRESSION	
55	1-751-781-11	WIRE (FLAT TYPE) (15 CORE)	
*56	A-4649-837-A	CN BOARD, COMPLETE	
57	1-751-780-11	WIRE (FLAT TYPE) (26 CORE)	
58	1-751-830-11	WIRE (FLAT TYPE) (24 CORE)	
59	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6	
*60	A-4649-835-A	DIG BOARD, COMPLETE	
*61	3-906-062-01	SPACER (AT)	
62	1-751-782-11	WIRE (FLAT TYPE) (16 CORE)	
*63	1-649-502-11	BUF BOARD	
*64	1-649-494-11	AC BOARD	
*65	A-4649-828-A	AD-DA BOARD, COMPLETE (MDS-B1)	
*65	A-4649-842-A	AD-DA BOARD, COMPLETE (MDS-B2P)	

Ref.No.	Part No.	Description	Remark
*66	1-649-495-11	IO (2) BOARD	
*67	1-650-444-11	IO (1) BOARD	
*68	1-649-499-11	EXTENTION BOARD	
69	3-906-061-01	SPACER (SW)	
70	2-251-642-01	GUARD, POWER SWITCH	
*71	3-906-057-01	PANEL, BACK (MDS-B1)	
*72	3-906-057-11	PANEL, BACK (MDS-B2P)	
*73	X-4801-204-0	TERMINAL ASSY	
*74	1-649-493-11	D-SUB BOARD	
*75	1-649-500-11	PRI BOARD	
76	3-387-373-01	SCREW (M2.6), HEXAGON	
*77	A-4649-829-A	PS BOARD, COMPLETE	
*78	1-649-899-11	REG (D) BOARD	
*79	1-619-900-11	REG (A) BOARD	
△T1	1-423-802-11	TRANSFORMER, POWER	

7-3. MECHANISM DECK SECTION-1

(MDS-B1 : MDM-1D)
(MDS-B2P : MDM-1E)

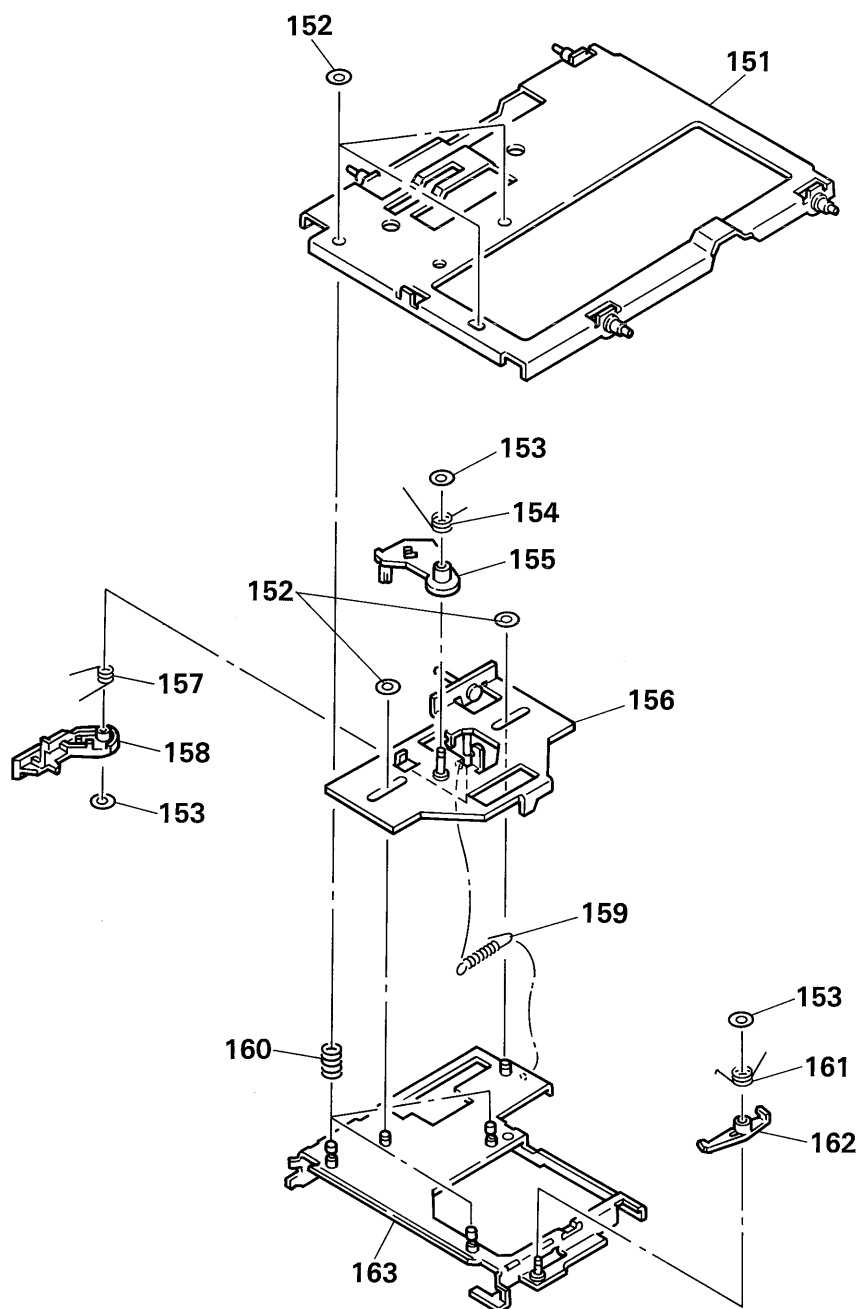


Ref.No.	Part No.	Description	Remark
*101	X-4943-546-1	BRACKET (GUIDE L) ASSY	
103	4-957-800-01	DAMPER (MD)	
104	X-4943-553-1	RACK (PLATE CAM L) ASSY	
*105	4-957-799-01	BLOCK (SW)	
*106	1-647-652-16	IN/OUT SW BOARD	
108	4-957-801-01	GEAR (CAM GEAR)	
109	4-957-805-01	GEAR (S)	
110	4-957-804-01	GEAR (2)	
111	4-957-795-01	GEAR (DRIVING)	
112	4-957-794-01	PULLEY (GEAR 1)	
113	4-957-797-01	BELT (LOADING)	
114	3-558-708-21	WASHER, STOPPER	
115	3-558-708-01	WASHER, STOPPER	
*116	1-647-653-16	INTERRUPTER BOARD	
117	4-957-816-01	LEVER (REC LEVER) (MDS-B1)	

Ref.No.	Part No.	Description	Remark
118	4-957-815-01	SHAFT (REC LEVER) (MDS-B1)	
*119	4-957-814-01	BRACKET (REC LEVER) (MDS-B1)	
*120	A-4649-454-A	HED DRIVE BOARD, COMPLETE (MDS-B1)	
*120	A-4649-960-A	HEAD DRIVE BOARD, COMPLETE (MDS-B2P)	
121	1-751-068-11	WIRE (FLAT TYPE) (24 CORE)	
*122	1-647-654-16	LOADING MOTOR BOARD	
123	X-4943-554-1	SHAFT (JOINT) ASSY	
*124	A-4649-658-A	SERVO DRIVE BOARD, COMPLETE	
*125	X-4943-552-1	BRACKET (BU) ASSY	
126	X-4943-551-1	RACK (PLATE CAM R) ASSY	
*127	X-4943-547-1	BRACKET (GUIDE R) ASSY	
*128	A-4649-450-A	RF BOARD, COMPLETE	
129	4-957-798-01	WASHER, STOPPER	
M401	A-4660-373-A	MOTOR ASSY (LOADING)	

7-4. MECHANISM DECK SECTION-2 (SLIDER ASSY)

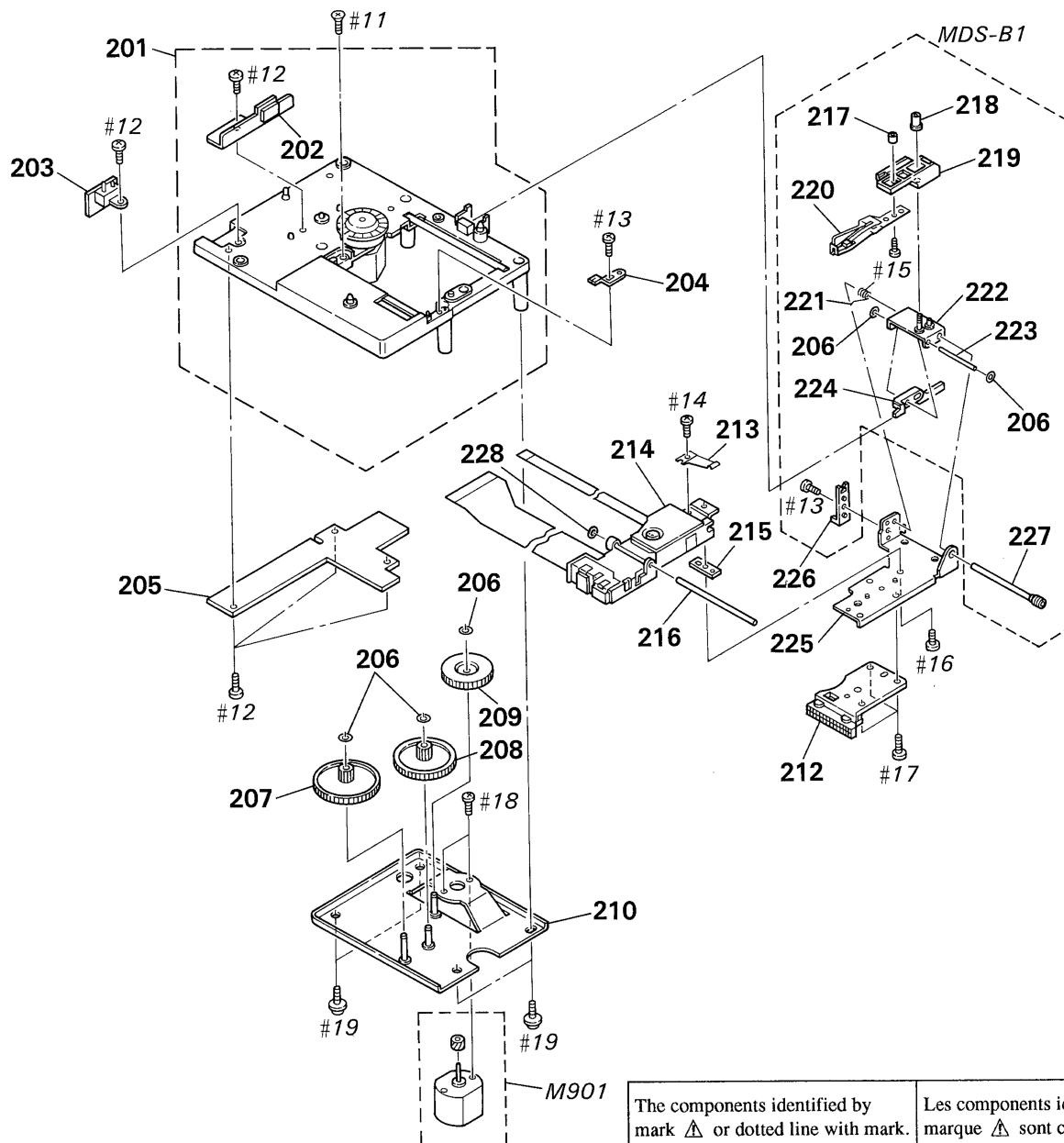
(MDS-B1 : MDM-1D)
(MDS-B2P : MDM-1E)



Ref.No.	Part No.	Description	Remark
* 151	X-4943-549-1	SLIDER ASSY	
152	3-558-708-01	WASHER, STOPPER	
153	4-957-798-01	WASHER, STOPPER	
154	4-957-810-01	SPRING, TORSION	
155	4-957-802-01	LEVER (DETECTION)	
* 156	X-4943-550-1	SLIDER (EJECT) ASSY	
157	4-957-809-01	SPRING (EJECT LEVER), TORSION	

Ref.No.	Part No.	Description	Remark
158	4-957-803-01	LEVER (EJECT)	
159	4-957-811-01	SPRING (EJ SLIDER), TORSION	
160	4-957-808-01	SPRING, COMPRESSION	
161	4-957-812-01	SPRING (SHUTTER LEVER), TORSION	
162	4-958-651-01	LEVER (SHUTTER L)	
* 163	X-4943-548-1	HOLDER ASSY	

7-5. BASE UNIT SECTION (MDS-B1: MBU-1A)
(MDS-B2P: MBU-1B)



The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
---	---

Ref.No.	Part No.	Description	Remark
201	A-4660-222-A	CHASSIS (BU) COMPLETE ASSY	
202	A-4660-364-A	BRACKET (MAGNET) ASSY	
* 203	1-647-647-12	DETECTION SW BOARD	
204	4-957-047-01	HOLDER (SHAFT)	
* 205	1-647-648-12	BU RELAY BOARD	
206	3-681-678-00	WASHER, SLIT	
207	4-957-057-01	GEAR (PINION A)	
208	4-957-058-01	GEAR (PINION B)	
209	4-957-059-01	GEAR (PINION C)	
* 210	X-4943-431-1	BRACKET (PINION) ASSY	
212	X-4943-432-1	RACK ASSY	
213	4-957-056-01	DETENT (OPTICS BLOCK)	
Δ 214	8-583-003-21	DEVICE, MINI DISK KMS-140B	
215	4-957-048-01	SPACER	

Ref.No.	Part No.	Description	Remark
216	4-957-044-01	SHAFT (SLED A)	
217	4-957-053-01	NUT (M1.7), FITTING (MDS-B1)	
218	4-957-658-01	NUT (M2), FASTENING (MDS-B1)	
* 219	4-957-054-01	HOLDER (OWH) (MDS-B1)	
220	1-500-006-11	HEAD, OVER LIGHT (MDS-B1)	
221	4-957-049-01	SPRING (HOLDER), TORSION (MDS-B1)	
* 222	X-4943-433-1	BRACKET (HOLDER) ASSY (MDS-B1)	
223	4-957-051-01	SHAFT (SLED D) (MDS-B1)	
* 224	4-957-061-01	LEVER (OWH) (MDS-B1)	
* 225	4-957-052-01	BRACKET (RACK)	
* 226	4-957-055-01	HOLDER (WIRE) (MDS-B1)	
227	X-4943-434-1	SCREW ASSY, ADJUSTMENT (MDS-B1)	
228	4-958-741-01	SPACER	
M901	X-4944-046-1	MOTOR ASSY, SLED	

SECTION 8 ELECTRICAL PARTS LIST

AC

AD-DA

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- **RESISTORS**
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **SEMICONDUCTORS**
In each case, u : μ , for example:
uA... : μ A..., uPA... : μ PA..., uPB... : μ PB...,
uPC... : μ PC..., uPD... : μ PD...
- **CAPACITORS**
uF : μ F
- **COILS**
uH : μ H

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

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

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

Ref.No.	Part No.	Description	Remark			
*	1-649-494-11	AC BOARD *****				
	1-555-724-00	WIRE, GROUND				
		< CAPACITOR >				
△C1	1-161-744-51	CERAMIC	0.01uF		400V	
△C2	1-161-744-51	CERAMIC	0.01uF		400V	
		< CONNECTOR >				
*CN1	1-580-940-11	PIN, CONNECTOR 4P				
		< JACK >				
△CNJ1	1-580-375-11	INLET 3P (～AC IN)				
		< SWITCH >				
△S1	1-570-117-21	SWITCH, SEESAW (AC POWER) (POWER)				

*	A-4649-828-A	AD-DA BOARD, COMPLETE (MDS-B1)				
*	A-4649-842-A	AD-DA BOARD, COMPLETE (MDS-B2P)				

*	4-870-539-00	PLATE, GROUND				
		< CAPACITOR >				
C501	1-124-477-11	ELECT	47uF	20%	25V	
C502	1-124-477-11	ELECT	47uF	20%	25V	
C503	1-110-335-11	MYLAR	100PF	5%	50V	
C504	1-110-335-11	MYLAR	100PF	5%	50V	
C505	1-136-165-00	FILM	0.1uF	5%	50V	
C509	1-136-153-00	FILM	0.01uF	5%	50V	
C510	1-164-159-11	CERAMIC	0.1uF		50V	
C511	1-110-335-11	MYLAR	100PF	5%	50V	
C512	1-110-335-11	MYLAR	100PF	5%	50V	
C550	1-107-037-00	MICA	82PF	5%	500V	
C551	1-107-287-91	MICA	30PF	5%	500V	
C552	1-107-287-91	MICA	30PF	5%	500V	
C553	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C554	1-130-479-00	MYLAR	0.0047uF	5%	50V	

Ref.No.	Part No.	Description	Remark			
C555	1-130-472-00	MYLAR	0.0012uF	5%	50V	
C556	1-124-477-11	ELECT	47uF	20%	25V	
C557	1-124-477-11	ELECT	47uF	20%	25V	
C559	1-136-165-00	FILM	0.1uF	5%	50V	
C560	1-136-165-00	FILM	0.1uF	5%	50V	
C601	1-124-477-11	ELECT	47uF	20%	25V	
C602	1-124-477-11	ELECT	47uF	20%	25V	
C603	1-110-335-11	MYLAR	100PF	5%	50V	
C604	1-110-335-11	MYLAR	100PF	5%	50V	
C605	1-136-165-00	FILM	0.1uF	5%	50V	
C606	1-124-477-11	ELECT	47uF	20%	25V	
C607	1-136-165-00	FILM	0.1uF	5%	50V	
C609	1-136-153-00	FILM	0.01uF	5%	50V	
C610	1-164-159-11	CERAMIC	0.1uF		50V	
C611	1-110-335-11	MYLAR	100PF	5%	50V	
C612	1-110-335-11	MYLAR	100PF	5%	50V	
C650	1-107-037-00	MICA	82PF	5%	500V	
C651	1-107-287-91	MICA	30PF	5%	500V	
C652	1-107-287-91	MICA	30PF	5%	500V	
C653	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C654	1-130-479-00	MYLAR	0.0047uF	5%	50V	
C655	1-130-472-00	MYLAR	0.0012uF	5%	50V	
C656	1-124-477-11	ELECT	47uF	20%	25V	
C657	1-124-477-11	ELECT	47uF	20%	25V	
C659	1-136-165-00	FILM	0.1uF	5%	50V	
C660	1-136-165-00	FILM	0.1uF	5%	50V	
C703	1-124-477-11	ELECT	47uF	20%	25V	
C704	1-124-477-11	ELECT	47uF	20%	25V	
C705	1-124-477-11	ELECT	47uF	20%	25V	
C706	1-164-159-11	CERAMIC	0.1uF		50V	
C707	1-164-159-11	CERAMIC	0.1uF		50V	
C710	1-136-165-00	FILM	0.1uF	5%	50V	
C711	1-136-165-00	FILM	0.1uF	5%	50V	
C712	1-136-165-00	FILM	0.1uF	5%	50V	
C713	1-136-177-00	FILM	1uF	5%	50V	
C714	1-136-158-00	FILM	0.027uF	5%	50V	
C715	1-162-282-31	CERAMIC	100PF	10%	50V	
C716	1-162-290-31	CERAMIC	470PF	10%	50V	
C730	1-124-477-11	ELECT	47uF	20%	25V	

AD-DA

Ref.No.	Part No.	Description	Remark
C734	1-164-159-11	CERAMIC 0.1uF	50V
C735	1-164-159-11	CERAMIC 0.1uF	50V
C736	1-164-159-11	CERAMIC 0.1uF	50V
C739	1-124-477-11	ELECT 47uF	20% 25V
C740	1-124-477-11	ELECT 47uF	20% 25V
C741	1-126-103-11	ELECT 470uF	20% 16V
C742	1-126-103-11	ELECT 470uF	20% 16V
C743	1-136-165-00	FILM 0.1uF	5% 50V
C750	1-164-159-11	CERAMIC 0.1uF	50V
C751	1-164-159-11	CERAMIC 0.1uF	50V
C752	1-164-159-11	CERAMIC 0.1uF	50V
C753	1-164-159-11	CERAMIC 0.1uF	50V
C754	1-164-159-11	CERAMIC 0.1uF	50V
C755	1-124-477-11	ELECT 47uF	20% 25V
C756	1-124-477-11	ELECT 47uF	20% 25V
C757	1-124-477-11	ELECT 47uF	20% 25V
C758	1-124-477-11	ELECT 47uF	20% 25V
C759	1-124-477-11	ELECT 47uF	20% 25V

< CONNECTOR >

*CN501	1-564-339-00	PIN, CONNECTOR 5P
*CN601	1-564-339-61	PIN, CONNECTOR 5P
CN701	1-580-463-21	SOCKET, CONNECTOR 16P
CN702	1-695-088-11	PIN, CONNECTOR (PC BOARD) 9P

< DIODE >

D501	8-719-987-63	DIODE 1N4148M
D502	8-719-987-63	DIODE 1N4148M
D503	8-719-987-63	DIODE 1N4148M
D504	8-719-987-63	DIODE 1N4148M
D601	8-719-987-63	DIODE 1N4148M
D602	8-719-987-63	DIODE 1N4148M
D603	8-719-987-63	DIODE 1N4148M
D604	8-719-987-63	DIODE 1N4148M
D701	8-719-987-63	DIODE 1N4148M
D702	8-719-045-72	DIODE KV1550N
D703	8-719-987-63	DIODE 1N4148M
D704	8-719-987-63	DIODE 1N4148M
D705	8-719-987-63	DIODE 1N4148M
D706	8-719-987-63	DIODE 1N4148M

< ENCAPSULATED COMPONENT >

FB701	1-236-163-11	ENCAPSULATED COMPONENT 1000P
FB702	1-236-163-11	ENCAPSULATED COMPONENT 1000P

< IC >

IC701	8-759-045-15	IC CS5339-KS (MDS-B1)
IC702	8-752-359-50	IC CXD2564AM

Ref.No.	Part No.	Description	Remark
IC703	8-759-927-29	IC SN74HC04ANS	
IC704	8-759-926-95	IC SN74HC4020-ANS	
IC705	8-759-250-81	IC TC5081AP	
IC707	8-759-708-05	IC NJM78L05A	
IC708	8-759-700-65	IC NJM79L05A	
IC710	8-759-900-72	IC NE5532P	
IC711	8-759-900-72	IC NE5532P	
IC712	8-759-900-72	IC NE5532P	
IC715	8-759-900-72	IC NE5532P (MDS-B1)	
IC716	8-759-109-82	IC UPC814C (MDS-B1)	
< COIL >			
L701	1-408-417-00	INDUCTOR 47uH	
L702	1-408-417-00	INDUCTOR 47uH	
L703	1-408-417-00	INDUCTOR 47uH	
L704	1-408-417-00	INDUCTOR 47uH	
L705	1-408-417-00	INDUCTOR 47uH	
L706	1-408-417-00	INDUCTOR 47uH	
L707	1-408-417-00	INDUCTOR 47uH	
L712	1-424-604-11	COIL 1.5uH	

< TRANSISTOR >

Q550	8-729-141-30	TRANSISTOR 2SC3623A-LK
Q650	8-729-141-30	TRANSISTOR 2SC3623A-LK
Q701	8-729-900-80	TRANSISTOR DTC114ES
Q702	8-729-806-04	TRANSISTOR 2SA1503
Q703	8-729-806-04	TRANSISTOR 2SA1503
Q704	8-729-806-04	TRANSISTOR 2SA1503

< RESISTOR >

R501	1-215-453-00	METAL 22K 1%	1/6W
R502	1-215-453-00	METAL 22K 1%	1/6W
R503	1-215-439-00	METAL 5.6K 1%	1/6W
R504	1-215-439-00	METAL 5.6K 1%	1/6W
R505	1-249-413-11	CARBON 470 5%	1/4W
R506	1-249-417-11	CARBON 1K 5%	1/4W
R507	1-249-417-11	CARBON 1K 5%	1/4W
R508	1-249-429-11	CARBON 10K 5%	1/4W
R509	1-249-419-11	CARBON 1.5K 5%	1/4W
R510	1-215-457-00	METAL 33K 1%	1/6W
R511	1-215-493-00	METAL 1M 1%	1/6W
R513	1-249-403-11	CARBON 68 5%	1/4W
R514	1-249-397-11	CARBON 22 5%	1/4W
R515	1-215-421-00	METAL 1K 1%	1/6W
R516	1-215-385-00	METAL 33 1%	1/6W
R550	1-215-457-00	METAL 33K 1%	1/6W
R551	1-215-457-00	METAL 33K 1%	1/6W
R552	1-215-451-00	METAL 18K 1%	1/6W
R553	1-215-451-00	METAL 18K 1%	1/6W

Ref.No.	Part No.	Description	Remark		
R554	1-215-465-00	METAL	68K	1%	1/6W
R555	1-215-465-00	METAL	68K	1%	1/6W
R556	1-249-441-11	CARBON	100K	5%	1/4W
R557	1-247-807-31	CARBON	100	5%	1/4W
R558	1-249-419-11	CARBON	1.5K	5%	1/4W
R559	1-249-419-11	CARBON	1.5K	5%	1/4W
R560	1-249-441-11	CARBON	100K	5%	1/4W
R562	1-249-417-11	CARBON	1K	5%	1/4W
R563	1-249-413-11	CARBON	470	5%	1/4W
R564	1-249-417-11	CARBON	1K	5%	1/4W
R565	1-249-441-11	CARBON	100K	5%	1/4W
R580	1-249-429-11	CARBON	10K	5%	1/4W
R581	1-249-429-11	CARBON	10K	5%	1/4W
R601	1-215-453-00	METAL	22K	1%	1/6W
R602	1-215-453-00	METAL	22K	1%	1/6W
R603	1-215-439-00	METAL	5.6K	1%	1/6W
R604	1-215-439-00	METAL	5.6K	1%	1/6W
R605	1-249-413-11	CARBON	470	5%	1/4W
R606	1-249-417-11	CARBON	1K	5%	1/4W
R607	1-249-417-11	CARBON	1K	5%	1/4W
R608	1-249-429-11	CARBON	10K	5%	1/4W
R609	1-249-419-11	CARBON	1.5K	5%	1/4W
R610	1-215-457-00	METAL	33K	1%	1/6W
R611	1-215-493-00	METAL	1M	1%	1/6W
R612	1-249-417-11	CARBON	1K	5%	1/4W
R613	1-249-403-11	CARBON	68	5%	1/4W
R614	1-249-397-11	CARBON	22	5%	1/4W
R615	1-215-421-00	METAL	1K	1%	1/6W
R616	1-215-385-00	METAL	33	1%	1/6W
R650	1-215-457-00	METAL	33K	1%	1/6W
R651	1-215-457-00	METAL	33K	1%	1/6W
R652	1-215-451-00	METAL	18K	1%	1/6W
R653	1-215-451-00	METAL	18K	1%	1/6W
R654	1-215-465-00	METAL	68K	1%	1/6W
R655	1-215-465-00	METAL	68K	1%	1/6W
R656	1-249-441-11	CARBON	100K	5%	1/4W
R657	1-247-807-31	CARBON	100	5%	1/4W
R658	1-249-419-11	CARBON	1.5K	5%	1/4W
R659	1-249-419-11	CARBON	1.5K	5%	1/4W
R660	1-249-441-11	CARBON	100K	5%	1/4W
R662	1-249-417-11	CARBON	1K	5%	1/4W
R663	1-249-413-11	CARBON	470	5%	1/4W
R664	1-249-417-11	CARBON	1K	5%	1/4W
R665	1-249-441-11	CARBON	100K	5%	1/4W
R680	1-249-429-11	CARBON	10K	5%	1/4W
R681	1-249-429-11	CARBON	10K	5%	1/4W
R702	1-249-429-11	CARBON	10K	5%	1/4W
R704	1-247-807-31	CARBON	100	5%	1/4W

Ref.No.	Part No.	Description	Remark		
R706	1-247-903-00	CARBON	1M	5%	1/4W
R707	1-249-417-11	CARBON	1K	5%	1/4W
R708	1-249-434-11	CARBON	27K	5%	1/4W
R709	1-249-431-11	CARBON	15K	5%	1/4W
R710	1-249-435-11	CARBON	33K	5%	1/4W
R711	1-249-417-11	CARBON	1K	5%	1/4W
R712	1-249-417-11	CARBON	1K	5%	1/4W
R713	1-249-429-11	CARBON	10K	5%	1/4W
R714	1-247-807-31	CARBON	100	5%	1/4W
R715	1-247-903-00	CARBON	1M	5%	1/4W
R716	1-249-417-11	CARBON	1K	5%	1/4W
R717	1-247-807-31	CARBON	100	5%	1/4W
R718	1-247-807-31	CARBON	100	5%	1/4W
< VARIABLE RESISTOR >					
RV501	1-230-721-11	RES, ADJ, CARBON 10K (RECORD CH-1 (L))	(MDS-B1)		
RV551	1-230-721-11	RES, ADJ, CARBON 10K (PLAY BACK CH-1 (L))			
RV601	1-230-721-11	RES, ADJ, CARBON 10K (RECORD CH-2 (R))	(MDS-B1)		
RV651	1-230-721-11	RES, ADJ, CARBON 10K (PLAY BACK CH-2 (R))			
< RELAY >					
RY701	1-515-716-11	RELAY (TQ2-5V) (AUTO CUE)			
< SWITCH >					
S701	1-692-457-11	SWITCH, SLIDE (MODE)	*****		

*	1-649-502-11	BUF BOARD	*****		

< CAPACITOR >					
C563	1-136-165-00	FILM	0.1uF	5%	50V
C663	1-136-165-00	FILM	0.1uF	5%	50V
< CONNECTOR >					
CN703	1-695-093-11	SOCKET, CONNECTOR 9P			
< IC >					
IC713	8-759-900-72	IC NE5532P			
IC714	8-759-900-72	IC NE5532P			
< RESISTOR >					
R568	1-215-421-00	METAL	1K	1%	1/6W
R570	1-249-417-11	CARBON	1K	5%	1/4W
R571	1-215-421-00	METAL	1K	1%	1/6W
R573	1-215-440-00	METAL	6.2K	1%	1/6W
R574	1-215-421-00	METAL	1K	1%	1/6W

BUF
BU RELAY
CN

Ref.No.	Part No.	Description	Remark		
R575	1-215-440-00	METAL	6.2K	1%	1/6W
R576	1-247-807-31	CARBON	100	5%	1/4W
R577	1-247-807-31	CARBON	100	5%	1/4W
R668	1-215-421-00	METAL	1K	1%	1/6W
R670	1-249-417-11	CARBON	1K	5%	1/4W
R671	1-215-421-00	METAL	1K	1%	1/6W
R673	1-215-440-00	METAL	6.2K	1%	1/6W
R674	1-215-421-00	METAL	1K	1%	1/6W
R675	1-215-440-00	METAL	6.2K	1%	1/6W
R676	1-247-807-31	CARBON	100	5%	1/4W
R677	1-247-807-31	CARBON	100	5%	1/4W

*	1-647-647-12	BU RELAY BOARD	*****		
< CONNECTOR >					
CN200	1-750-501-21	PIN, CONNECTOR (PC BOARD) 8P			
< SWITCH >					
S901	1-572-467-21	SWITCH, PUSH (1 KEY) (LIMIT)			

*	A-4649-837-A	CN BOARD, COMPLETE	*****		
< CAPACITOR >					
C801	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C802	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C803	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C804	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C805	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C806	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C807	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C808	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C809	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C810	1-124-779-00	ELECT CHIP	10uF	20%	16V
C811	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C812	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C813	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C814	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C815	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C816	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C817	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C818	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C819	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C820	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C821	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C822	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V

Ref.No.	Part No.	Description	Remark		
C823	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C824	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C825	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C826	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C827	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C828	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C829	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C830	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C831	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C832	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C833	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C834	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C835	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C836	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C837	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
< CONNECTOR >					
*CN801	1-750-511-21	CONNECTOR, FFC/FPC 24P			
*CN802	1-750-511-21	CONNECTOR, FFC/FPC 24P			
CN803	1-750-279-11	CONNECTOR, FFC/FPC 24P			
CN804	1-750-279-11	CONNECTOR, FFC/FPC 24P			
CN805	1-580-464-21	SOCKET, CONNECTOR 15P			
CN806	1-580-464-21	SOCKET, CONNECTOR 15P			
CN807	1-580-460-11	SOCKET, CONNECTOR 26P			
*CN808	1-750-494-11	PIN, CONNECTOR (PC BOARD) 6P			
*CN809	1-750-495-11	PIN, CONNECTOR (PC BOARD) 7P			
CN810	1-695-001-11	PIN, CONNECTOR (PC BOARD) 12P			
< DIODE >					
D801	8-719-800-76	DIODE	1SS226		
D802	8-719-800-76	DIODE	1SS226		
D803	8-719-800-76	DIODE	1SS226		
D804	8-719-800-76	DIODE	1SS226		
D805	8-719-800-76	DIODE	1SS226		
D806	8-719-800-76	DIODE	1SS226		
D807	8-719-800-76	DIODE	1SS226		
D808	8-719-800-76	DIODE	1SS226		
D809	8-719-800-76	DIODE	1SS226		
D810	8-719-800-76	DIODE	1SS226		
D811	8-719-800-76	DIODE	1SS226		
D812	8-719-800-76	DIODE	1SS226		
D813	8-719-800-76	DIODE	1SS226		
D814	8-719-800-76	DIODE	1SS226		
D815	8-719-800-76	DIODE	1SS226		
D816	8-719-800-76	DIODE	1SS226		
D817	8-719-800-76	DIODE	1SS226		

CN

DETECTION SWITCH

DIG

Ref.No.	Part No.	Description	Remark
< IC >			
IC801	8-759-925-76 IC	SN74HC08ANS	
IC802	8-759-925-76 IC	SN74HC08ANS	
IC803	8-759-925-76 IC	SN74HC08ANS	
IC804	8-759-925-74 IC	SN74HC04ANS	
< TRANSISTOR >			
Q801	8-729-805-64 TRANSISTOR	2SA1510	
Q802	8-729-805-64 TRANSISTOR	2SA1510	
Q803	8-729-805-64 TRANSISTOR	2SA1510	
Q804	8-729-805-64 TRANSISTOR	2SA1510	
Q805	8-729-805-64 TRANSISTOR	2SA1510	
Q806	8-729-805-64 TRANSISTOR	2SA1510	
Q807	8-729-805-64 TRANSISTOR	2SA1510	
Q808	8-729-805-64 TRANSISTOR	2SA1510	
Q809	8-729-805-64 TRANSISTOR	2SA1510	
Q810	8-729-805-64 TRANSISTOR	2SA1510	
Q811	8-729-805-64 TRANSISTOR	2SA1510	
Q812	8-729-805-64 TRANSISTOR	2SA1510	
< RESISTOR >			
R801	1-216-097-00 METAL CHIP	100K 5% 1/10W	
R802	1-216-089-91 METAL GLAZE	47K 5% 1/10W	
R803	1-216-109-00 METAL CHIP	330K 5% 1/10W	
R804	1-216-049-00 METAL CHIP	1K 5% 1/10W	
R805	1-216-073-00 METAL CHIP	10K 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	
R810	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R811	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	
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	1-216-049-00 METAL CHIP	1K 5% 1/10W	
R818	1-216-049-00 METAL CHIP	1K 5% 1/10W	
R819	1-216-025-00 METAL CHIP	100 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	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R823	1-216-073-00 METAL CHIP	10K 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	
R826	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R827	1-216-073-00 METAL CHIP	10K 5% 1/10W	

Ref.No.	Part No.	Description	Remark
R828	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R829	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R830	1-216-073-00 METAL CHIP	10K 5% 1/10W	
R831	1-216-073-00 METAL CHIP	10K 5% 1/10W	

*	1-647-648-12	DETECTION SWITCH BOARD	

< SWITCH >			
S001	1-692-464-11	SWITCH, PUSH (2 KEY) (RFLCT/PROT)	

*	A-4649-835-A	DIG BOARD, COMPLETE	

< CAPACITOR >			
C100	1-126-204-11 ELECT CHIP	47uF 20% 16V	
C101	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C102	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C103	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C104	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C105	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C106	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C107	1-164-232-11 CERAMIC CHIP	0.01uF 50V	
C108	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C109	1-164-232-11 CERAMIC CHIP	0.01uF 50V	
C110	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C111	1-126-206-11 ELECT CHIP	100uF 20% 6.3V	
C112	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C113	1-126-204-11 ELECT CHIP	47uF 20% 16V	
C114	1-126-204-11 ELECT CHIP	47uF 20% 16V	
C115	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C116	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C117	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C118	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C119	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C120	1-126-206-11 ELECT CHIP	100uF 20% 6.3V	
C121	1-163-241-11 CERAMIC CHIP	39PF 5% 50V	
C122	1-163-009-11 CERAMIC CHIP	0.001uF 10% 50V	
C123	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C124	1-163-009-11 CERAMIC CHIP	0.001uF 10% 50V	
C125	1-104-563-11 FILM CHIP	0.1uF 5% 16V	
C126	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C128	1-163-091-00 CERAMIC CHIP	8PF 50V	
C129	1-163-091-00 CERAMIC CHIP	8PF 50V	
C130	1-164-004-11 CERAMIC CHIP	0.1uF 10% 25V	
C131	1-104-640-11 FILM CHIP	0.22uF 5% 16V	
C132	1-163-037-11 CERAMIC CHIP	0.022uF 10% 25V	

Ref.No.	Part No.	Description		Remark
C133	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C134	1-137-299-11	FILM CHIP	0.027uF	5% 16V
C135	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C136	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C137	1-126-206-11	ELECT CHIP	100uF	20% 6.3V
C138	1-126-204-11	ELECT CHIP	47uF	20% 16V
C139	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C140	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C141	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C142	1-126-204-11	ELECT CHIP	47uF	20% 16V
C143	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C144	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C145	1-126-204-11	ELECT CHIP	47uF	20% 16V
C146	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C147	1-126-204-11	ELECT CHIP	47uF	20% 16V
C148	1-164-161-11	CERAMIC CHIP	0.0022uF	10% 100V
C149	1-164-161-11	CERAMIC CHIP	0.0022uF	10% 100V
C150	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C151	1-163-117-00	CERAMIC CHIP	100PF	5% 50V
C153	1-126-204-11	ELECT CHIP	47uF	20% 16V
C154	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C158	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C159	1-126-204-11	ELECT CHIP	47uF	20% 16V
C160	1-104-551-11	FILM CHIP	0.01uF	5% 16V
C161	1-163-003-11	CERAMIC CHIP	330PF	10% 50V
C162	1-164-344-11	CERAMIC CHIP	0.068uF	10% 25V
C163	1-126-395-11	ELECT	22uF	20% 16V
C164	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C165	1-126-395-11	ELECT	22uF	20% 16V
C166	1-126-395-11	ELECT	22uF	20% 16V
C167	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V
C168	1-163-117-00	CERAMIC CHIP	100PF	5% 50V
C169	1-104-559-11	FILM CHIP	0.047uF	5% 16V
C170	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V
C185	1-164-161-11	CERAMIC CHIP	0.0022uF	10% 100V
C187	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C190	1-162-211-31	CERAMIC	33PF	5% 50V
C191	1-162-294-31	CERAMIC	1000PF	5% 50V
C192	1-162-288-31	CERAMIC	330PF	5% 50V
C201	1-163-117-00	CERAMIC CHIP	100PF	5% 50V
C202	1-163-117-00	CERAMIC CHIP	100PF	5% 50V
C301	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C303	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C305	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C306	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C307	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C308	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C951	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C952	1-126-204-11	ELECT CHIP	47uF	20% 16V

Ref.No.	Part No.	Description	Remark
< CONNECTOR >			
CN105	1-580-870-31	SOCKET, CONNECTOR (SMT) 16P	
*CNP101	1-750-511-21	CONNECTOR, FFC/FPC 24P	
*CNP102	1-750-511-21	CONNECTOR, FFC/FPC 24P	
*CNP103	1-750-495-11	PIN, CONNECTOR (PC BOARD) 7P	
*CNP104	1-750-492-11	PIN, CONNECTOR (PC BOARD) 4P	
*CNP108	1-750-494-11	PIN, CONNECTOR (PC BOARD) 6P	
< DIODE >			
D102	8-719-974-98	DIODE HVM17-01	
D103	8-719-016-74	DIODE 1SS352	
D104	8-719-016-74	DIODE 1SS352	
< IC >			
IC101	8-752-355-96	IC CXD2527R	
IC102	8-752-356-18	IC CXD2527R-1	
IC103	8-752-352-18	IC CXD2525R	
IC104	8-759-242-70	IC TC7WU04F	
IC106	8-759-970-59	IC TLC272CPS	
IC109	8-759-096-83	IC M5M44400ATP-8L	
IC110	8-752-354-57	IC CXD2526Q	
IC111	8-759-197-14	IC M38067M8-065FP	
IC161	8-752-064-33	IC CXA1380N	
IC191	8-759-083-94	IC TC7W74FU	
IC192	8-759-234-13	IC TC4S30F	
< JUMPER RESISTOR >			
JW102	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JW201	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JW202	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JW203	1-216-295-91	METAL GLAZE 0 5% 1/10W	
< COIL >			
L101	1-412-333-41	INDUCTOR 2.7uH	
L102	1-412-332-41	INDUCTOR 2.2uH	
L103	1-412-332-41	INDUCTOR 2.2uH	
L104	1-412-340-31	INDUCTOR 10uH	
L105	1-412-344-31	INDUCTOR 22uH	
L106	1-412-340-31	INDUCTOR 10uH	
L107	1-412-340-31	INDUCTOR 10uH	
L108	1-412-336-41	INDUCTOR 4.7uH	
L109	1-412-332-41	INDUCTOR 2.2uH	
L150	1-543-962-21	BEAD, FERRITE (CHIP)	
L151	1-550-907-21	BEAD, FERRITE (CHIP)	
L152	1-543-962-21	BEAD, FERRITE (CHIP)	
L951	1-412-332-41	INDUCTOR 2.2uH	
L952	1-543-962-21	BEAD, FERRITE (CHIP)	
L953	1-543-962-21	BEAD, FERRITE (CHIP)	

Ref.No.	Part No.	Description	Remark
L954	1-543-962-21	BEAD, FERRITE (CHIP)	
L955	1-543-962-21	BEAD, FERRITE (CHIP)	
L956	1-543-962-21	BEAD, FERRITE (CHIP)	
< TRANSISTOR >			
Q101	8-729-421-19	TRANSISTOR UN2213	
Q102	8-729-901-06	TRANSISTOR DTA144EK	
< RESISTOR >			
R101	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R102	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R103	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R104	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R107	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R108	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R109	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R110	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R111	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R112	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R113	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R117	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R118	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R119	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R120	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R121	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R122	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R123	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R124	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R125	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R126	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R127	1-216-043-00	METAL CHIP 560 5% 1/10W	
R128	1-216-043-00	METAL CHIP 560 5% 1/10W	
R129	1-216-043-00	METAL CHIP 560 5% 1/10W	
R130	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R131	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R132	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R133	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
R134	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R135	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R136	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R137	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R138	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R139	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R140	1-216-043-00	METAL CHIP 560 5% 1/10W	
R141	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R142	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R144	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R145	1-216-025-00	METAL CHIP 100 5% 1/10W	
R146	1-216-049-00	METAL CHIP 1K 5% 1/10W	

Ref.No.	Part No.	Description	Remark
R147	1-216-045-00	METAL CHIP 680 5% 1/10W	
R148	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R149	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R150	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R151	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R152	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R153	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R154	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R155	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R156	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R157	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R158	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R159	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R160	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R161	1-218-758-11	METAL CHIP 180K 0.5% 1/10W	
R162	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R163	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R164	1-218-758-11	METAL CHIP 180K 0.5% 1/10W	
R165	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R166	1-216-112-00	METAL GLAZE 430K 5% 1/10W	
R167	1-216-090-00	METAL CHIP 51K 5% 1/10W	
R168	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R169	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R170	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R171	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R172	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R173	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R174	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R175	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R176	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R177	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R178	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R180	1-216-025-00	METAL CHIP 100 5% 1/10W	
R181	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R182	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R183	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R184	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R185	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R186	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R187	1-215-429-00	CARBON 2.2K 5% 1/6W	
R188	1-215-409-00	CARBON 330 5% 1/6W	
R193	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R194	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R195	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R196	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R197	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R198	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R201	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R202	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R203	1-216-097-00	METAL CHIP 100K 5% 1/10W	

DIG

DISP

Ref.No.	Part No.	Description	Remark
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< VIBRATOR >

X101	1-579-871-21	VIBRATOR, CRYSTAL (55MHz)	
X102	1-579-870-21	VIBRATOR, CRYSTAL (22.5792MHz)	
X103	1-579-951-11	VIBRATOR, CERAMIC (CHIP TYPE) (6MHz)	

*	A-4649-827-A	DISP BOARD, COMPLETE (MDS-B1)	
*	A-4649-841-A	DISP BOARD, COMPLETE (MDS-B2P)	

	1-251-154-11	SOCKET, IC 8P	
	1-540-044-11	SOCKET, IC	

*	4-956-134-01	HOLDER (FL TUBE)	
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< CAPACITOR >

C301	1-164-159-11	CERAMIC	0.1uF		50V
C302	1-162-282-31	CERAMIC	100PF	10%	50V
C303	1-164-159-11	CERAMIC	0.1uF		50V
C304	1-164-159-11	CERAMIC	0.1uF		50V
C305	1-164-159-11	CERAMIC	0.1uF		50V

C306	1-164-159-11	CERAMIC	0.1uF		50V
C307	1-164-159-11	CERAMIC	0.1uF		50V
C308	1-164-159-11	CERAMIC	0.1uF		50V
C309	1-164-159-11	CERAMIC	0.1uF		50V
C310	1-164-159-11	CERAMIC	0.1uF		50V

C311	1-164-159-11	CERAMIC	0.1uF		50V
C312	1-162-294-31	CERAMIC	0.001uF	10%	50V
C313	1-161-377-00	CERAMIC	0.0047uF	20%	16V
C314	1-124-234-00	ELECT	22uF	20%	16V
C315	1-124-234-00	ELECT	22uF	20%	16V

< CONNECTOR >

CN301	1-580-464-11	SOCKET, CONNECTOR 15P	
CN302	1-580-464-11	SOCKET, CONNECTOR 15P	
*CN303	1-506-503-11	PIN, CONNECTOR 9P	
*CN304	1-564-336-00	PIN, CONNECTOR 2P	
*CN305	1-506-503-61	PIN, CONNECTOR 9P	

< DIODE >

D301	8-719-987-63	DIODE	1N4148M
D302	8-719-987-63	DIODE	1N4148M
D303	8-719-987-63	DIODE	1N4148M
D304	8-719-987-63	DIODE	1N4148M
D305	8-719-987-63	DIODE	1N4148M

D306	8-719-987-63	DIODE	1N4148M
D307	8-719-987-63	DIODE	1N4148M
D308	8-719-987-63	DIODE	1N4148M
D309	8-719-987-63	DIODE	1N4148M
D310	8-719-987-63	DIODE	1N4148M

D311	8-719-987-63	DIODE	1N4148M
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Ref.No.	Part No.	Description	Remark
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D312	8-719-987-63	DIODE	1N4148M
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< INDICATOR TUBE >

FL301	1-517-256-11	INDICATOR TUBE, FLUORESCENT	
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< IC >

IC301	8-759-262-70	IC	M38004E8-SP-B1-1
IC302	8-759-254-76	IC	M66004FP
IC303	8-759-925-76	IC	SN74HC08ANS
IC304	8-752-330-61	IC	CXK1013P
IC305	8-759-051-53	IC	TD62381F

IC306	8-759-926-06	IC	SN74HC126ANS
IC307	8-759-008-79	IC	MC14011BF
IC308	8-759-051-53	IC	TD62381F

< TRANSISTOR >

Q306	8-729-806-04	TRANSISTOR	2SA1503
Q307	8-729-806-04	TRANSISTOR	2SA1503

< RESISTOR >

R301	1-247-807-31	CARBON	100	5%	1/4W
R302	1-247-807-31	CARBON	100	5%	1/4W
R303	1-249-437-11	CARBON	47K	5%	1/4W
R304	1-249-437-11	CARBON	47K	5%	1/4W
R305	1-249-437-11	CARBON	47K	5%	1/4W

R311	1-249-437-11	CARBON	47K	5%	1/4W
R312	1-249-437-11	CARBON	47K	5%	1/4W
R313	1-249-437-11	CARBON	47K	5%	1/4W
R315	1-249-434-11	CARBON	27K	5%	1/4W
R316	1-249-437-11	CARBON	47K	5%	1/4W

R317	1-249-417-11	CARBON	1K	5%	1/4W
R318	1-249-417-11	CARBON	1K	5%	1/4W
R319	1-249-417-11	CARBON	1K	5%	1/4W
R320	1-249-417-11	CARBON	1K	5%	1/4W
R321	1-249-417-11	CARBON	1K	5%	1/4W

R322	1-249-417-11	CARBON	1K	5%	1/4W
R323	1-249-417-11	CARBON	1K	5%	1/4W
R324	1-249-417-11	CARBON	1K	5%	1/4W
R325	1-249-417-11	CARBON	1K	5%	1/4W
R326	1-249-417-11	CARBON	1K	5%	1/4W

R327	1-249-403-11	CARBON	68	5%	1/4W
R328	1-249-403-11	CARBON	68	5%	1/4W

DISP

D-SUB

EXTENSION

Ref.No.	Part No.	Description	Remark		
R329	1-247-807-31	CARBON	100	5%	1/4W
R330	1-249-413-11	CARBON	470	5%	1/4W
R331	1-247-807-31	CARBON	100	5%	1/4W
R332	1-249-437-11	CARBON	47K	5%	1/4W
R333	1-249-437-11	CARBON	47K	5%	1/4W
R334	1-249-437-11	CARBON	47K	5%	1/4W
R336	1-249-437-11	CARBON	47K	5%	1/4W
R337	1-249-437-11	CARBON	47K	5%	1/4W
R338	1-249-437-11	CARBON	47K	5%	1/4W
R339	1-249-417-11	CARBON	1K	5%	1/4W
R340	1-249-437-11	CARBON	47K	5%	1/4W
R341	1-249-429-11	CARBON	10K	5%	1/4W
R342	1-249-429-11	CARBON	10K	5%	1/4W
R345	1-249-403-11	CARBON	68	5%	1/4W
< COMPOSITION CIRCUIT BLOCK >					
RB301	1-232-976-11	COMPOSITION CIRCUIT BLOCK 10KX8			
< SWITCH >					
S301	1-554-303-21	SWITCH, TACTILE (EDIT) (MDS-B1)			
S302	1-692-649-61	SWITCH, TACTILE (PREVIOUS ◀)			
S303	1-554-303-21	SWITCH, TACTILE (ENTER) (MDS-B1)			
S304	1-692-651-21	SWITCH, TACTILE (EJECT ▲) (INCLUDE D1)			
S305	1-692-650-21	SWITCH, TACTILE (REC ●) (INCLUDE D2)	(MDS-B1)		
S306	1-692-649-61	SWITCH, TACTILE (NEXT ▶)			
S307	1-572-607-31	SWITCH, PUSH (ILLUMINATION) (CUE STDBY ▶)	(INCLUDE D4)		
S308	1-572-609-61	SWITCH, PUSH (ILLUMINATION) (PLAY/PAUSE ▶)	(INCLUDE D5)		
S309	1-692-649-71	SWITCH, TACTILE (STOP ■) (INCLUDE D3)			
S310	1-554-303-21	SWITCH, TACTILE (DISPLAY)			
*S311	1-571-157-11	SWITCH, TOGGLE (REPEAT MODE)			
< VIBRATOR >					
X301	1-579-233-11	VIBRATOR, CERAMIC (5MHz)			

*	1-649-493-11	D-SUB BOARD	*****		
< CAPACITOR >					
C851	1-164-159-11	CERAMIC	0.1uF		50V
C854	1-162-294-31	CERAMIC	0.001uF	10%	50V
C855	1-162-294-31	CERAMIC	0.001uF	10%	50V
C856	1-162-294-31	CERAMIC	0.001uF	10%	50V
C857	1-162-294-31	CERAMIC	0.001uF	10%	50V
C858	1-162-294-31	CERAMIC	0.001uF	10%	50V

Ref.No.	Part No.	Description	Remark		
C860	1-162-294-31	CERAMIC	0.001uF	10%	50V
C861	1-162-294-31	CERAMIC	0.001uF	10%	50V
C862	1-162-294-31	CERAMIC	0.001uF	10%	50V
C863	1-162-294-31	CERAMIC	0.001uF	10%	50V
C864	1-162-294-31	CERAMIC	0.001uF	10%	50V
C865	1-162-294-31	CERAMIC	0.001uF	10%	50V
C866	1-162-294-31	CERAMIC	0.001uF	10%	50V
C867	1-162-294-31	CERAMIC	0.001uF	10%	50V
C868	1-162-294-31	CERAMIC	0.001uF	10%	50V
C869	1-162-294-31	CERAMIC	0.001uF	10%	50V
C870	1-162-294-31	CERAMIC	0.001uF	10%	50V
C871	1-162-294-31	CERAMIC	0.001uF	10%	50V
C872	1-162-294-31	CERAMIC	0.001uF	10%	50V
C873	1-162-294-31	CERAMIC	0.001uF	10%	50V
C874	1-162-294-31	CERAMIC	0.001uF	10%	50V
< CONNECTOR >					
CN851	1-580-460-11	SOCKET, CONNECTOR 26P			
< JACK >					
J851	1-764-392-11	CONNECTOR (D-SUB) 25P (REMOTE 25P)			
< TRANSISTOR >					
Q851	8-729-927-03	TRANSISTOR	2SC4115SS		
Q852	8-729-927-03	TRANSISTOR	2SC4115SS		
Q853	8-729-927-03	TRANSISTOR	2SC4115SS		
Q854	8-729-927-03	TRANSISTOR	2SC4115SS		
Q855	8-729-927-03	TRANSISTOR	2SC4115SS		
Q856	8-729-927-03	TRANSISTOR	2SC4115SS		
Q857	8-729-927-03	TRANSISTOR	2SC4115SS		
Q858	8-729-927-03	TRANSISTOR	2SC4115SS		
< RESISTOR >					
R851	1-249-417-11	CARBON	1K	5%	1/4W
R852	1-249-417-11	CARBON	1K	5%	1/4W
R853	1-249-417-11	CARBON	1K	5%	1/4W
R854	1-249-417-11	CARBON	1K	5%	1/4W
R855	1-249-417-11	CARBON	1K	5%	1/4W
R856	1-249-417-11	CARBON	1K	5%	1/4W
R857	1-249-417-11	CARBON	1K	5%	1/4W
R858	1-249-417-11	CARBON	1K	5%	1/4W
R863	1-249-389-11	CARBON	4.7	5%	1/4W

*	1-649-499-11	EXTENSION BOARD			

< CONNECTOR >					
*CN907	1-569-503-11	PIN, CONNECTOR 8P			

EXTENSION

HEAD DRIVE

IO(1)

IO(2)

Ref.No.	Part No.	Description	Remark
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CN908	1-564-710-11	PIN, CONNECTOR (PC BOARD) 8P	
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*	A-4649-454-A	HEAD DRIVE BOARD, COMPLETE (MDS-B1)	
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*	A-4649-960-A	HEAD DRIVE BOARD, COMPLETE (MDS-B2P)	
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< CAPACITOR >

C401	1-163-038-00	CERAMIC CHIP	0.1uF	25V	(MDS-B1)
C402	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C405	1-104-476-11	FILM	2200PF	5%	630V (MDS-B1)
C406	1-135-159-21	TANTALUM CHIP	10uF	10%	20V (MDS-B1)
C407	1-164-336-11	CERAMIC CHIP	0.33uF	25V	(MDS-B1)

< CONNECTOR >

CN403	1-750-491-11	PIN, CONNECTOR (PC BOARD) 3P (MDS-B1)	
CN404	1-750-496-11	PIN, CONNECTOR (PC BOARD) 2P	
CN406	1-750-498-11	PIN, CONNECTOR (PC BOARD) 4P	

< DIODE >

D401	8-719-033-60	DIODE	F1P2STP	(MDS-B1)
D402	8-719-033-60	DIODE	F1P2STP	(MDS-B1)
D403	8-719-033-60	DIODE	F1P2STP	(MDS-B1)
D404	8-719-033-60	DIODE	F1P2STP	(MDS-B1)
D405	8-719-033-60	DIODE	F1P2STP	(MDS-B1)
D406	8-719-033-60	DIODE	F1P2STP	(MDS-B1)

< IC >

IC401	8-759-244-73	IC	TC74ACT540F	(MDS-B1)
IC402	8-759-243-19	IC	TC7SU04F	(MDS-B1)

< TRANSISTOR >

Q401	8-729-017-97	TRANSISTOR	ME8P06-TE16F3	(MDS-B1)
Q402	8-729-017-97	TRANSISTOR	ME8P06-TE16F3	(MDS-B1)
Q403	8-729-017-96	TRANSISTOR	ME6N10-TE16F3	(MDS-B1)
Q404	8-729-017-96	TRANSISTOR	ME6N10-TE16F3	(MDS-B1)

< RESISTOR >

R401	1-216-097-00	METAL CHIP	100K	5%	1/10W (MDS-B1)
R402	1-216-097-00	METAL CHIP	100K	5%	1/10W (MDS-B1)
R403	1-216-097-00	METAL CHIP	100K	5%	1/10W (MDS-B1)
R404	1-216-097-00	METAL CHIP	100K	5%	1/10W (MDS-B1)
R405	1-216-298-00	METAL CHIP	2.2	5%	1/10W (MDS-B1)
R406	1-216-298-00	METAL CHIP	2.2	5%	1/10W (MDS-B1)
R426	1-216-298-00	METAL CHIP	2.2	5%	1/10W (MDS-B1)
R427	1-216-298-00	METAL CHIP	2.2	5%	1/10W (MDS-B1)
R430	1-216-073-00	METAL CHIP	10K	5%	1/10W
R431	1-216-049-00	METAL CHIP	1K	5%	1/10W
R432	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref.No.	Part No.	Description	Remark
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R433	1-216-138-00	METAL CHIP	3.3 5% 1/8W (MDS-B1)
R434	1-216-138-00	METAL CHIP	3.3 5% 1/8W (MDS-B1)
R435	1-216-138-00	METAL CHIP	3.3 5% 1/8W (MDS-B1)
R436	1-216-138-00	METAL CHIP	3.3 5% 1/8W (MDS-B1)

R437	1-216-134-00	METAL CHIP	2.2 5% 1/8W (MDS-B1)
R438	1-216-134-00	METAL CHIP	2.2 5% 1/8W (MDS-B1)
R439	1-216-134-00	METAL CHIP	2.2 5% 1/8W (MDS-B1)
R440	1-216-134-00	METAL CHIP	2.2 5% 1/8W (MDS-B1)
R451	1-216-073-00	METAL CHIP	10K 5% 1/10W

R452	1-216-073-00	METAL CHIP	10K 5% 1/10W
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*	1-650-444-11	IO (1) BOARD	
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< CAPACITOR >

C590	1-124-478-11	ELECT	100uF	20%	25V
C591	1-124-478-11	ELECT	100uF	20%	25V
C592	1-130-467-00	MYLAR	470PF	5%	50V
C593	1-130-467-00	MYLAR	470PF	5%	50V

< ENCAPSULATED COMPONENT >

FB501	1-236-163-11	ENCAPSULATED COMPONENT	1000P
FB502	1-236-163-11	ENCAPSULATED COMPONENT	1000P
FB550	1-236-163-11	ENCAPSULATED COMPONENT	1000P
FB551	1-236-163-11	ENCAPSULATED COMPONENT	1000P

< JACK >

J501	1-764-394-11	CONNECTOR (XLR TYPE) 3P (CH-1(L) IN)	(MDS-B1)
J551	1-764-393-11	CONNECTOR (XLR TYPE) 3P (CH-1(L) OUT)	

< RESISTOR >

R590	1-249-441-11	CARBON	100K	5%	1/4W
R591	1-249-441-11	CARBON	100K	5%	1/4W

*	1-649-495-11	IO (2) BOARD	
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< CAPACITOR >

C540	1-130-467-00	MYLAR	470PF	5%	50V
C541	1-130-467-00	MYLAR	470PF	5%	50V
C640	1-130-467-00	MYLAR	470PF	5%	50V
C641	1-130-467-00	MYLAR	470PF	5%	50V
C690	1-124-478-11	ELECT	100uF	20%	25V
C691	1-124-478-11	ELECT	100uF	20%	25V
C692	1-130-467-00	MYLAR	470PF	5%	50V
C693	1-130-467-00	MYLAR	470PF	5%	50V

IO (2)

IN/OUT SW

INTERRUPTER

JACK

LED

LOADING MOTOR

PRI

PS

Ref.No.	Part No.	Description	Remark
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< ENCAPSULATED COMPONENT >

FB601	1-236-163-11	ENCAPSULATED COMPONENT 1000P	
FB602	1-236-163-11	ENCAPSULATED COMPONENT 1000P	
FB650	1-236-163-11	ENCAPSULATED COMPONENT 1000P	
FB651	1-236-163-11	ENCAPSULATED COMPONENT 1000P	

< JACK >

J601	1-764-394-11	CONNECTOR (XLR TYPE) 3P (CH-2(R) IN) (MDS-B1)	
J651	1-764-393-11	CONNECTOR (XLR TYPE) 3P (CH-2(R) OUT)	

< RESISTOR >

R690	1-249-441-11	CARBON	100K	5%	1/4W
R691	1-249-441-11	CARBON	100K	5%	1/4W

*	1-647-652-16	IN/OUT SW BOARD	
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< CONNECTOR >

CN412	1-750-497-11	PIN, CONNECTOR (PC BOARD) 3P	
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< SWITCH >

S401	1-571-300-21	SWITCH, ROTARY (IN/OUT)	
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*	1-647-653-16	INTERRUPTER BOARD	
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< IC >

IC403	8-759-071-52	IC ON1023-S	
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*	1-649-501-11	JACK BOARD	
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*	3-906-054-01	BRACKET (HP)	
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< CAPACITOR >

C351	1-162-294-31	CERAMIC	0.001uF	10%	50V
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< ENCAPSULATED COMPONENT >

FB351	1-236-163-11	ENCAPSULATED COMPONENT 1000P	
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< JACK >

J351	1-562-837-21	JACK (REMOTE)	
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< COIL >

L351	1-410-509-11	INDUCTOR	10uH
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Ref.No.	Part No.	Description	Remark
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*	1-649-503-11	LED BOARD	
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< LED >

LED301	8-719-043-21	DIODE GL7H202 (NEXT PLAY)	
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*	1-647-654-16	LOADING MOTOR BOARD	
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< CONNECTOR >

CN409	1-750-496-11	PIN, CONNECTOR (PC BOARD) 2P	
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*	1-649-500-11	PRI BOARD	
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< CONNECTOR >

*CN4	1-580-940-11	PIN, CONNECTOR 4P	
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< SWITCH >

△S2	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR)	
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△S3	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR)	
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*	A-4649-829-A	PS BOARD, COMPLETE	
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*	1-533-293-11	FUSE HOLDER	
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< CAPACITOR >

△C3	1-161-742-00	CERAMIC	0.0022uF	20%	400V
△C4	1-161-742-00	CERAMIC	0.0022uF	20%	400V
△C5	1-161-742-00	CERAMIC	0.0022uF	20%	400V
△C6	1-161-742-00	CERAMIC	0.0022uF	20%	400V
C901	1-164-159-11	CERAMIC	0.1uF		50V

C902	1-126-950-11	ELECT	330uF	20%	35V
C903	1-124-572-11	ELECT	100uF	20%	63V
C904	1-161-494-00	CERAMIC	0.022uF		25V
C905	1-161-494-00	CERAMIC	0.022uF		25V
C906	1-104-773-11	ELECT	22000uF	20%	16V

C907	1-124-898-11	ELECT	4700uF	20%	16V
C911	1-136-165-00	FILM	0.1uF	5%	50V
C912	1-136-165-00	FILM	0.1uF	5%	50V
C913	1-124-564-11	ELECT	4700uF	20%	25V
C914	1-124-564-11	ELECT	4700uF	20%	25V

C917	1-124-360-00	ELECT	1000uF	20%	16V
C918	1-124-360-00	ELECT	1000uF	20%	16V

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

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

PS**REG (A)****REG (D)****RF**

Ref.No.	Part No.	Description	Remark
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< CONNECTOR >

CN2	1-580-939-11	SOCKET, CONNECTOR 4P	
CN3	1-580-939-11	SOCKET, CONNECTOR 4P	
CN901	1-695-001-11	PIN, CONNECTOR (PC BOARD) 12P	
CN902	1-569-494-21	SOCKET, CONNECTOR 8P	
*CN903	1-564-509-11	PLUG, CONNECTOR 6P	
*CN904	1-564-509-11	PLUG, CONNECTOR 6P	

< DIODE >

D901	8-719-312-47	DIODE	RBA-406B
D902	8-719-200-02	DIODE	10E2
D903	8-719-933-33	DIODE	HZS6A1L
D904	8-719-200-02	DIODE	10E2
D905	8-719-200-02	DIODE	10E2
D906	8-719-200-02	DIODE	10E2
D907	8-719-200-02	DIODE	10E2
D908	8-719-987-63	DIODE	1N4148M
D909	8-719-987-63	DIODE	1N4148M
D911	8-719-200-02	DIODE	10E2
D912	8-719-200-02	DIODE	10E2

< FUSE >

△F901	1-532-203-00	FUSE, TIME-LAG (T2A) (AEP, UK)
△F901	1-576-104-11	FUSE (2A) (US, Canadian)
△F902	1-532-203-00	FUSE, TIME-LAG (T2A) (AEP, UK)
△F902	1-576-104-11	FUSE (2A) (US, Canadian)
△F903	1-532-066-00	FUSE, TIME-LAG (T0.4A) (AEP, UK)
△F903	1-576-096-11	FUSE (0.4A) (US, Canadian)
△F904	1-532-078-00	FUSE, TIME-LAG (T1A) (AEP, UK)
△F904	1-576-100-11	FUSE (1A) (US, Canadian)
△F905	1-532-078-00	FUSE, TIME-LAG (T1A) (AEP, UK)
△F905	1-576-100-11	FUSE (1A) (US, Canadian)

< IC >

IC901	8-759-633-42	IC	M5293L
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< COIL >

△L1	1-421-915-11	COIL, LINE FILTER
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< RESISTOR >

R901	1-249-437-11	CARBON	47K	5%	1/4W
R902	1-247-807-31	CARBON	100	5%	1/4W
R903	1-247-807-31	CARBON	100	5%	1/4W

Ref.No.	Part No.	Description	Remark
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*	1-649-900-11	REG (A) BOARD	

< CAPACITOR >

C915	1-124-477-11	ELECT	47uF	20%	25V
C916	1-136-165-00	FILM	0.1uF	5%	50V
C921	1-136-165-00	FILM	0.1uF	5%	50V
C922	1-136-165-00	FILM	0.1uF	5%	50V

< CONNECTOR >

*CN906	1-564-509-11	PLUG, CONNECTOR 6P	
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< IC >

IC904	8-759-146-55	IC	UPC2412HF
IC905	8-759-604-45	IC	M5F79M12L

*	1-649-899-11	REG (D) BOARD	

< CAPACITOR >

C909	1-164-159-11	CERAMIC	0.1uF		50V
C910	1-164-159-11	CERAMIC	0.1uF		50V
C919	1-164-159-11	CERAMIC	0.1uF		50V
C920	1-164-159-11	CERAMIC	0.1uF		50V
C923	1-124-443-00	ELECT	100uF	20%	10V
C924	1-124-443-00	ELECT	100uF	20%	10V

< CONNECTOR >

*CN905	1-564-509-11	PLUG, CONNECTOR 6P	
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< IC >

IC902	8-759-144-82	IC	UPC2405HF
IC903	8-759-144-82	IC	UPC2405HF

A-4649-450-A	RF BOARD, COMPLETE

< CAPACITOR >

C201	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C202	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C215	1-126-395-11	ELECT	22uF	20%	16V
C216	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C219	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C220	1-126-602-11	ELECT CHIP	3.3uF	20%	50V
C221	1-104-640-11	FILM CHIP	0.22uF	5%	16V
C223	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C224	1-126-206-11	ELECT CHIP	100uF	20%	6.3V

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

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

Ref.No.	Part No.	Description	Remark		
C225	1-104-557-11	FILM CHIP	0.033uF	5%	16V
C226	1-126-191-11	ELECT	0.47uF	20%	50V
C227	1-126-395-11	ELECT	22uF	20%	16V
C228	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C229	1-126-395-11	ELECT	22uF	20%	16V
C230	1-137-286-11	FILM CHIP	0.0022uF	5%	16V
C231	1-104-563-11	FILM CHIP	0.1uF	5%	16V
C232	1-104-559-11	FILM CHIP	0.047uF	5%	16V
C233	1-126-395-11	ELECT	22uF	20%	16V
C234	1-104-563-11	FILM CHIP	0.1uF	5%	16V
C240	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C241	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C242	1-126-191-11	ELECT	0.47uF	20%	50V
C243	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C244	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C245	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C250	1-126-395-11	ELECT	22uF	20%	16V
C251	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C252	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C253	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C254	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C255	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C256	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C257	1-104-555-11	FILM CHIP	0.022uF	5%	16V
C258	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C259	1-126-193-11	ELECT	1uF	20%	50V
C260	1-135-159-21	TANTALUM CHIP	10uF	10%	20V
C261	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C262	1-135-159-21	TANTALUM CHIP	10uF	10%	20V
C265	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C267	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C268	1-126-191-11	ELECT	0.47uF	20%	50V
C269	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C270	1-126-395-11	ELECT	22uF	20%	16V
C271	1-104-544-11	FILM CHIP	0.0027uF	5%	50V
C272	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C273	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C274	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C280	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C281	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C284	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C285	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C286	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C287	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C288	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C294	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C295	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V

Ref.No.	Part No.	Description	Remark		
C296	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
< CONNECTOR >					
CN201	1-580-888-11	SOCKET, CONNECTOR (SMT) 18P			
CN202	1-580-876-11	SOCKET, CONNECTOR (SMT) 5P			
*CN203	1-695-241-11	PIN, CONNECTOR (PC BOARD) 8P			
CN205	1-750-491-11	PIN, CONNECTOR (PC BOARD) 3P			
*CN206	1-750-494-11	PIN, CONNECTOR (PC BOARD) 6P			
CN207	1-750-279-11	CONNECTOR, FFC/FPC 24P			
CN208	1-750-279-11	CONNECTOR, FFC/FPC 24P			
*CN210	1-695-241-11	PIN, CONNECTOR (PC BOARD) 8P			
CN211	1-750-490-11	PIN, CONNECTOR (PC BOARD) 2P			
CN212	1-750-491-11	PIN, CONNECTOR (PC BOARD) 3P			
< DIODE >					
D202	8-719-029-88	DIODE HSM198STL			
D203	8-719-016-74	DIODE 1SS352			
D204	8-719-017-76	DIODE MA8030			
D205	8-719-977-03	DIODE DTZ5.6B			
< IC >					
IC205	8-752-057-45	IC CXA1082BQ			
IC206	8-759-981-48	IC TL082M			
IC207	8-759-009-06	IC MC14052BF			
IC208	8-759-745-64	IC NJM4560M			
IC209	8-752-064-34	IC CXA1381R			
IC213	8-759-242-70	IC TC7WU04F			
IC214	8-759-300-71	IC HD14053BFP			
IC215	8-759-300-71	IC HD14053BFP			
IC216	8-759-242-64	IC TC4W53F			
< COIL >					
L201	1-543-948-11	BEAD, FERRITE (CHIP)			
L202	1-543-948-11	BEAD, FERRITE (CHIP)			
L203	1-543-948-11	BEAD, FERRITE (CHIP)			
L204	1-543-948-11	BEAD, FERRITE (CHIP)			
< TRANSISTOR >					
Q201	8-729-901-06	TRANSISTOR DTA144EK			
Q202	8-729-620-06	TRANSISTOR 2SC3052-EF			
Q203	8-729-101-07	TRANSISTOR 2SB798-DL			
Q204	8-729-421-19	TRANSISTOR UN2213			
Q205	8-729-901-06	TRANSISTOR DTA144EK			
Q209	8-729-620-06	TRANSISTOR 2SC3052-EF			
Q210	8-729-421-19	TRANSISTOR UN2213			
< RESISTOR >					
R111	1-216-295-91	METAL GLAZE	0	5%	1/10W
R112	1-216-295-91	METAL GLAZE	0	5%	1/10W

Ref.No.	Part No.	Description	Remark		
R201	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R203	1-218-754-11	METAL CHIP	120K	0.5%	1/10W
R211	1-216-085-00	METAL CHIP	33K	5%	1/10W
R212	1-216-085-00	METAL CHIP	33K	5%	1/10W
R213	1-216-085-00	METAL CHIP	33K	5%	1/10W
R214	1-216-085-00	METAL CHIP	33K	5%	1/10W
R215	1-216-085-00	METAL CHIP	33K	5%	1/10W
R216	1-216-085-00	METAL CHIP	33K	5%	1/10W
R217	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R218	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R219	1-216-085-00	METAL CHIP	33K	5%	1/10W
R220	1-216-085-00	METAL CHIP	33K	5%	1/10W
R221	1-216-085-00	METAL CHIP	33K	5%	1/10W
R222	1-216-085-00	METAL CHIP	33K	5%	1/10W
R223	1-216-660-11	METAL CHIP	2.4K	0.5%	1/10W
R224	1-216-081-00	METAL CHIP	22K	5%	1/10W
R225	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R226	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R227	1-216-662-11	METAL CHIP	3K	0.5%	1/10W
R228	1-216-049-00	METAL CHIP	1K	5%	1/10W
R229	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R230	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W
R231	1-216-097-00	METAL CHIP	100K	5%	1/10W
R232	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R233	1-216-697-11	METAL CHIP	82K	0.5%	1/10W
R234	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R235	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R236	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R237	1-218-769-11	METAL CHIP	510K	0.5%	1/10W
R240	1-218-754-11	METAL CHIP	120K	0.5%	1/10W
R241	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R242	1-216-121-00	METAL CHIP	1M	5%	1/10W
R243	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R244	1-218-766-11	METAL CHIP	390K	0.5%	1/10W
R245	1-216-081-00	METAL CHIP	22K	5%	1/10W
R246	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R247	1-216-668-11	METAL CHIP	5.1K	0.5%	1/10W
R248	1-216-049-00	METAL CHIP	1K	5%	1/10W
R249	1-216-028-00	METAL CHIP	130	5%	1/10W
R250	1-216-081-00	METAL CHIP	22K	5%	1/10W
R252	1-216-093-00	METAL CHIP	68K	5%	1/10W
R253	1-216-093-00	METAL CHIP	68K	5%	1/10W
R254	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R255	1-216-668-11	METAL CHIP	5.1K	0.5%	1/10W
R256	1-216-093-00	METAL CHIP	68K	5%	1/10W
R257	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R258	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R259	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref.No.	Part No.	Description	Remark		
R260	1-216-047-00	METAL CHIP	820	5%	1/10W
R261	1-218-281-11	METAL GLAZE	18	5%	1/2W
R262	1-216-097-00	METAL CHIP	100K	5%	1/10W
R263	1-216-045-00	METAL CHIP	680	5%	1/10W
R264	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R265	1-216-081-00	METAL CHIP	22K	5%	1/10W
R266	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R267	1-216-692-11	METAL CHIP	51K	0.5%	1/10W
R268	1-218-772-11	METAL CHIP	680K	0.5%	1/10W
R270	1-216-049-00	METAL CHIP	1K	5%	1/10W
R271	1-216-121-00	METAL CHIP	1M	5%	1/10W
R272	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R273	1-216-049-00	METAL CHIP	1K	5%	1/10W
R274	1-216-121-00	METAL CHIP	1M	5%	1/10W
R275	1-216-044-00	METAL CHIP	620	5%	1/10W
R276	1-216-097-00	METAL CHIP	100K	5%	1/10W
R277	1-216-697-11	METAL CHIP	82K	0.5%	1/10W
R278	1-216-073-00	METAL CHIP	10K	5%	1/10W
R279	1-216-049-00	METAL CHIP	1K	5%	1/10W
R280	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R281	1-216-668-11	METAL CHIP	5.1K	0.5%	1/10W
R282	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R283	1-216-073-00	METAL CHIP	10K	5%	1/10W
R284	1-216-097-00	METAL CHIP	100K	5%	1/10W
R285	1-216-049-00	METAL CHIP	1K	5%	1/10W
R286	1-216-073-00	METAL CHIP	10K	5%	1/10W
R287	1-216-049-00	METAL CHIP	1K	5%	1/10W
R288	1-216-073-00	METAL CHIP	10K	5%	1/10W
R289	1-216-073-00	METAL CHIP	10K	5%	1/10W
R290	1-216-073-00	METAL CHIP	10K	5%	1/10W
R291	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R292	1-216-081-00	METAL CHIP	22K	5%	1/10W
R293	1-216-049-00	METAL CHIP	1K	5%	1/10W
R294	1-216-092-00	METAL GLAZE	62K	5%	1/10W
R295	1-216-021-00	METAL CHIP	68	5%	1/10W
R296	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R297	1-218-236-91	METAL GLAZE	1	10%	1/4W
R298	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R299	1-216-674-11	METAL CHIP	9.1K	0.5%	1/10W

< VARIABLE RESISTOR >

RV201	1-241-396-11	RES, ADJ, METAL GLAZE 22K (MO GROOVE TRAVERSE)
RV202	1-241-396-11	RES, ADJ, METAL GLAZE 22K (MO PIT TRAVERSE)
RV203	1-241-396-11	RES, ADJ, METAL GLAZE 22K (CD TRAVERSE)
RV204	1-241-392-11	RES, ADJ, METAL GLAZE 1K (LASER POWER)
RV205	1-241-393-21	RES, ADJ, METAL GLAZE 2.2K (TEMP, COMP OFFSET)

RF SERVO DRIVE

Ref.No.	Part No.	Description	Remark
RV206	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K (MO FOCUS BIAS)	
RV207	1-241-396-11	RES, ADJ, METAL GLAZE 22K (FOK OFFSET)	
RV208	1-241-396-11	RES, ADJ, METAL GLAZE 22K (FOCUS BIAS OFFSET)	
RV209	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K (E-F BALANCE)	
RV210	1-241-396-11	RES, ADJ, METAL GLAZE 22K (FOCUS GAIN)	
RV211	1-241-396-11	RES, ADJ, METAL GLAZE 22K (TRACKING GAIN)	
RV212	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K (CD FOCUS BIAS)	
RV215	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K (CD RF LEVEL)	

A-4649-658-A SERVO DRIVE BOARD, COMPLETE

- * 4-875-327-01 HEAT SINK
- * 4-922-525-01 HEAT SINK
- 7-682-547-09 SCREW +BVT 3X6 (S)

< CAPACITOR >

C408	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C409	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C410	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C411	1-126-204-11	ELECT CHIP	47uF	20% 16V
C412	1-126-204-11	ELECT CHIP	47uF	20% 16V
C413	1-126-204-11	ELECT CHIP	47uF	20% 16V
C414	1-126-204-11	ELECT CHIP	47uF	20% 16V
C415	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C416	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C417	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C418	1-126-206-11	ELECT CHIP	100uF	20% 6.3V
C419	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C420	1-126-206-11	ELECT CHIP	100uF	20% 6.3V
C421	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C422	1-126-206-11	ELECT CHIP	100uF	20% 6.3V

< CONNECTOR >

- *CN401 1-695-008-11 PIN, CONNECTOR (PC BOARD) 8P
- CN402 1-750-490-11 PIN, CONNECTOR (PC BOARD) 2P
- *CN405 1-695-241-11 PIN, CONNECTOR (PC BOARD) 8P
- CN407 1-750-491-11 PIN, CONNECTOR (PC BOARD) 3P
- *CN408 1-750-494-11 PIN, CONNECTOR (PC BOARD) 6P

< IC >

IC404	8-759-823-11	IC	LA6523
IC405	8-759-823-11	IC	LA6523
IC406	8-759-089-53	IC	UPC79M05HF
IC407	8-759-144-82	IC	UPC2405HF
IC408	8-759-144-82	IC	UPC2405HF

< RESISTOR >

R407	1-216-001-00	METAL CHIP	10	5%	1/10W
R408	1-216-001-00	METAL CHIP	10	5%	1/10W

Ref.No.	Part No.	Description	Remark
R409	1-216-001-00	METAL CHIP	10 5% 1/10W
R410	1-216-073-00	METAL CHIP	10K 5% 1/10W
R411	1-216-073-00	METAL CHIP	10K 5% 1/10W
R412	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
R413	1-216-691-11	METAL CHIP	47K 0.5% 1/10W
R414	1-216-093-00	METAL CHIP	68K 5% 1/10W
R415	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
R416	1-216-001-00	METAL CHIP	10 5% 1/10W
R417	1-216-001-00	METAL CHIP	10 5% 1/10W
R418	1-216-073-00	METAL CHIP	10K 5% 1/10W
R419	1-216-073-00	METAL CHIP	10K 5% 1/10W
R420	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
R421	1-216-687-11	METAL CHIP	33K 0.5% 1/10W
R453	1-216-295-91	METAL GLAZE	0 5% 1/10W
R454	1-216-295-91	METAL GLAZE	0 5% 1/10W
R456	1-216-295-91	METAL GLAZE	0 5% 1/10W

MISCELLANEOUS

- 55 1-751-781-11 WIRE (FLAT TYPE) (15 CORE)
- 57 1-751-780-11 WIRE (FLAT TYPE) (26 CORE)
- 58 1-751-830-11 WIRE (FLAT TYPE) (24 CORE)
- 62 1-751-782-11 WIRE (FLAT TYPE) (16 CORE)
- 121 1-751-068-11 WIRE (FLAT TYPE) (24 CORE)

- △214 8-583-003-21 DEVICE, MINI DISK KMS-140B
- 220 1-500-006-11 HEAD, OVER LIGHT (MDS-B1)
- M401 A-4660-373-A MOTOR ASSY (LOADING)
- M901 X-4944-046-1 MOTOR ASSY, SLED
- △T1 1-423-802-11 TRANSFORMER, POWER

ACCESSORIES & PACKING MATERIALS

- 1-467-284-11 REMOTE COMMANDER (RM-DC1) (MDS-B1)
- 1-765-107-11 CORD, CONNECTION
- △ 1-551-812-11 CORD, POWER (US, Canadian)
- △ 1-590-910-11 CORD SET, POWER (AEP, UK)
- * 3-703-845-01 LABEL (N) (U/C), MAIN CAUTION

- 3-757-820-03 MANUAL, OPERATION (ENGLISH) (MDS-B1)
- 3-757-821-03 MANUAL, OPERATION (FRENCH) (MDS-B1)
- 3-757-822-03 MANUAL, OPERATION (GERMAN) (AEP, UK) (MDS-B1)
- 3-757-824-03 MANUAL, OPERATION (ENGLISH) (MDS-B2P)
- 3-757-825-03 MANUAL, OPERATION (FRENCH) (MDS-B2P)
- 3-757-826-03 MANUAL, OPERATION (GERMAN) (AEP, UK) (MDS-B2P)
- 4-875-574-00 SHEET, PROTECTION
- * 4-941-548-01 LABEL, CLASS (1) (AEP, UK)
- * 4-950-766-01 LABEL, FCC DIGITAL DEVICE (US, Canadian)

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

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MDS-B1/B2P

Ref.No.	Part No.	Description	Remark
*	4-963-114-02	INDIVIDUAL CARTON (MDS-B1)	
*	4-963-115-01	CUSHION (A)	
*	4-963-116-01	CUSHION (B)	
*	4-963-118-02	INDIVIDUAL CARTON (MDS-B2P)	

HARDWARE LIST

#1	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
#2	7-621-259-39	SCREW +P 2.6X5
#3	7-682-546-09	SCREW +B 3X5
#4	7-682-561-09	SCREW +B 4X8
#5	7-682-660-09	SCREW +PS 4X6
#6	7-682-547-09	SCREW +BVTT 3X6 (S)
#7	7-682-548-09	SCREW +BVTT 3X8 (S)
#8	7-621-775-10	SCREW +B 2.6X4
#9	7-621-770-XX	SCREW +BVTT 2.6X8 (S)
#10	7-621-775-00	SCREW +B 2.6X3
#11	7-621-592-00	SCREW +K 2.6X6
#12	7-621-772-10	SCREW +B 2X4
#13	7-627-852-08	SCREW,PRECISION +P 1.7X2.5
#14	7-627-551-28	SCREW,PRECISION +P 1.4X2.5
#15	7-627-552-78	SCREW,PRECISION +P 1.7X3.5 (MDS-B1)
#16	7-627-852-97	SCREW,PRECISION +P1.7X4.5TYPE3
#17	7-627-552-48	SCREW,PRECISION +P 1.7X4
#18	7-627-852-38	SCREW,PRECISION +P1.7X1.8TYPE3
#19	7-621-255-35	SCREW (2MMX5), + PWH
#20	7-621-770-67	SCREW +BVTT 2.6X6 (S)

MDS-B1/B2P

SONY® SERVICE MANUAL

*US Model
Canadian Model
AEP Model
UK Model*

SUPPLEMENT-1

File this supplement with the service manual.

Subject :

- 1. MAINTENANCE SCHEDULE**
- 2. SHIPPING MODE**
- 3. CORRECTION OF SERVICE MANUAL**

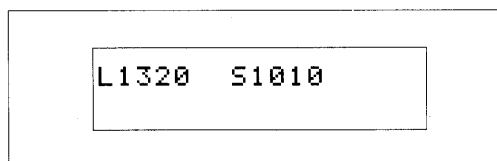
1. MAINTENANCE SCHEDULE

• Maintenance Procedures

In order to achieve the above purposes, the replacement of consumable parts, the cleaning of other mechanical parts, and the check and adjustment of the electrical system are periodically carried out. It is recommended that the read out value of the HOURS METER in the DISPLAY Menu be used as one standard of the frequency. Depending on the reading of the head hours meter, the guidelines for maintenance and check as well as parts to be replaced are listed below. Note that the frequency for replacing each part is based on its life estimated on the experience, but it may be changed from future data.

Part Name (Part No.)	Reading of Hours meter and replacement interval
DEVICE, MINI DISC KMS-140B (8-583-003-21)	Replace the pickup every 1,500 hours.
CHASSIS (BU) COMPLETE ASSY (A-4660-222-A)	Replace the spindle motor every 3,000 hours.
BELT (LOADING) (4-957-797-01)	Replace the loading belt every 3,000 hours.

The hours meter showing the accumulated operating times appears.



L: Accumulated laser diode operating time.

S: Accumulated spindle motor operating time.

Refer to the L value for replacing the pickup, and the S value for replacing the loading belt and spindle motor.

For the model MDS-B2P (playback only machine), the L value is kept to "0000".

NOTE: • For indication of Hours meter, see page 27 of MDS-B1/B2P service manual (9-959-167-11) (7-5. Reading the Hours Meter).

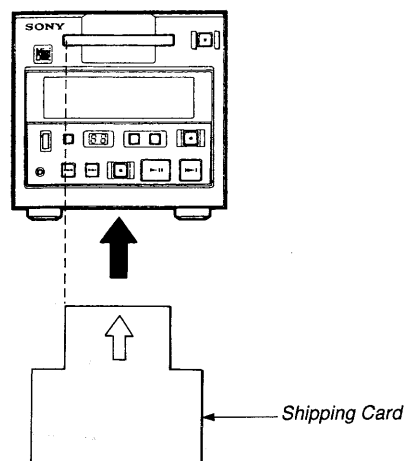
- When replacing the KMS-140B, adjust the Focus gain and Tracking gain adjustment.

2. SHIPPING MODE

- After service work is finished, be sure to set the disc chucking mechanism in the shipping mode.

- To set the machine in the shipping mode.

1. Turn the unit ON.



2. Align shipping card (3-702-670-01) against the left side of the disc compartment, then insert it. (The motor starting sound will be heard.)
3. After you hear the motor start up, withdraw shipping card.
4. Turn OFF the unit while 「TOC Reading」 appears in the display window. (The shipping mode is automatically released when the power switch is turned on next time.)

3. CORRECTION OF SERVICE MANUAL

 : Corrected Portion

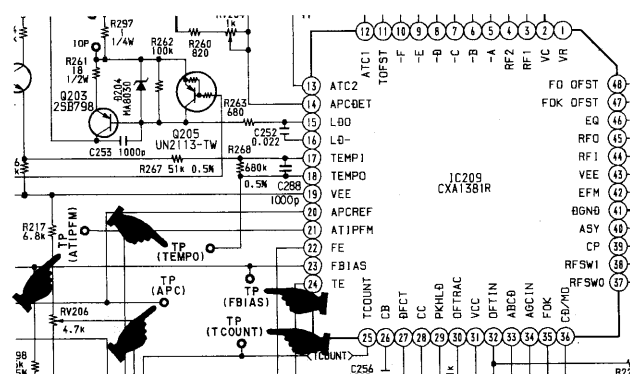
Page	Incorrect	Correct												
36	3-1. TEST MODE SETTING While pressing the PLAY/PAUSE ► key and CUE/STDBY ► key, connect the power cord to the AC outlet, then release the PLAY/PAUSE ► key and CUE/STDBY ► key.	3-1. TEST MODE SETTING Keep pressing the PLAY/PAUSE ► key and the CUE/STDBY ► key until 「CHEC」 is displayed. When 「CHEC」 is displayed, connect the power cord to the AC outlet, then release the PLAY/PAUSE ► key and CUE/STDBY ► key. 												
36	3-3. TEST MODE OPERATION [] represents main operations by each key.	3-3. TEST MODE OPERATION [] represents main operations by each key. - When a disc is ejected, the LED in EJECT ▲ key continues flickering. - Do not connect the RM-DC1 in the TEST mode.  												
36	<table><tr><th>REPEAT 1</th><th>REPEAT ALL</th></tr><tr><td>[Focus servo on]</td><td>[Tracking servo gain → LOW → HIGH →]</td></tr><tr><td>[Focus servo and CLV servo on]</td><td>[All servos on CLV servo → A → S →]</td></tr></table>	REPEAT 1	REPEAT ALL	[Focus servo on]	[Tracking servo gain → LOW → HIGH →]	[Focus servo and CLV servo on]	[All servos on CLV servo → A → S →]	  <table><tr><th>REPEAT ALL</th><th>REPEAT 1</th></tr><tr><td>[Focus servo on]</td><td>[Tracking servo gain → LOW → HIGH →]</td></tr><tr><td>[Focus servo and CLV servo on]</td><td>[All servos on CLV servo → A → S →]</td></tr></table>	REPEAT ALL	REPEAT 1	[Focus servo on]	[Tracking servo gain → LOW → HIGH →]	[Focus servo and CLV servo on]	[All servos on CLV servo → A → S →]
REPEAT 1	REPEAT ALL													
[Focus servo on]	[Tracking servo gain → LOW → HIGH →]													
[Focus servo and CLV servo on]	[All servos on CLV servo → A → S →]													
REPEAT ALL	REPEAT 1													
[Focus servo on]	[Tracking servo gain → LOW → HIGH →]													
[Focus servo and CLV servo on]	[All servos on CLV servo → A → S →]													
37	<table><tr><td>►►</td><td>Sled in</td></tr><tr><td>◄◄</td><td>Sled out</td></tr></table>	►►	Sled in	◄◄	Sled out	  <table><tr><td>◄◄</td><td>Sled in</td></tr><tr><td>►►</td><td>Sled out</td></tr></table>	◄◄	Sled in	►►	Sled out				
►►	Sled in													
◄◄	Sled out													
◄◄	Sled in													
►►	Sled out													
37	NOTE: * 1 : Play mode switch of the OFF conditions. * 2 : Play mode switch of the REPEAT ALL conditions. * 3 : Play mode switch of the REPEAT 1 conditions.	NOTE: * 1 : Play mode switch of the OFF conditions. * 2 : Play mode switch of the REPEAT 1 conditions. * 3 : Play mode switch of the REPEAT ALL conditions.  												

Page	Incorrect	Correct
38	4-4. OFFSET ADJUSTMENT Note: This adjustment should be performed immediately after setting the test mode. Performing other adjustments switch the operation mode, and the correct adjustment can not be performed.	4-4. OFFSET ADJUSTMENT Note: This adjustment should be performed immediately after setting the test mode. Performing other adjustments switch the operation mode, and the correct adjustment can not be performed. <u>(Refer to SECTION 3.)</u> 
40	4-6. MO TRAVERSE ADJUSTMENT 6. Play mode switch of the REPEAT 1 conditions. 18. Play mode switch of the REPEAT 1 conditions.	4-6. MO TRAVERSE ADJUSTMENT 6. Play mode switch of the <u>REPEAT ALL</u> conditions.  18. Play mode switch of the <u>REPEAT ALL</u> conditions. 
41	4-8. CD TRAVERSE ADJUSTMENT 5. Play mode switch of the REPEAT 1 conditions.	4-8. CD TRAVERSE ADJUSTMENT 5. Play mode switch of the <u>REPEAT ALL</u> conditions. 
44	4-11. ERROR RATE CONFIRMATION MO repeated recording disc making: (MDS-B1 model only)	4-11. ERROR RATE CONFIRMATION <u>Making MO continuous recording: (MDS-B1 model only)</u> 

6-5. SCHEMATIC DIAGRAM — RF Section —

Page: 69, Location: H-17 — I-18

 : Corrected Portion



MDS-B1/B2P

SONY[®] SERVICE MANUAL

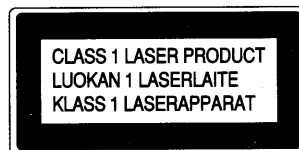
*US Model
Canadian Model
AEP Model
UK Model*

SUPPLEMENT-2

Subject: Change of adjustment method.

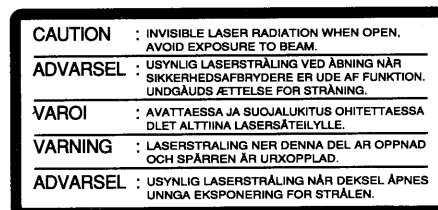
Because of the change as mentioned above, perform the operation of Electrical Adjustment following the description given by this SUPPLEMENT-2 Service Manual instead of original Service Manual.

• **Additional of the CLASS 1 label and CAUTION label.**



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.



SECTION 1

ELECTRICAL ADJUSTMENTS

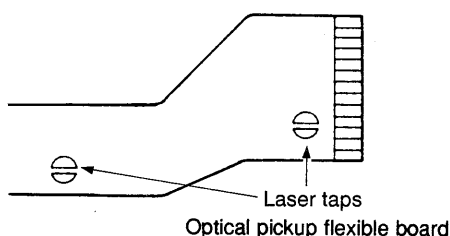
1-1. CAUTION ON LASER DIODE EMITTING CONFIRMATION

Never look the laser diode emission from right above when adjusting. It may cause loss of eyesight.

1-2. NOTE ON MiniDisc DEVICE (KMS-140B) HANDLING

The laser diode within the optical pickup is extremely subjected to electrostatic destruction. So, the laser tap on the flexible board should be bridge soldering when handling. Connect the solder bridge before disconnecting the connector. Also, do not remove the solder bridge before connecting the connector.

There are two laser taps, and use a preferable one. Furthermore, take fully measurements against the electrostatic destruction. Take care of handling the flexible board because it can be damaged.



After replacing the MiniDisc device, perform adjustment and confirmation as follows.

- Temperature compensation offset adjustment
- Laser power adjustment
- MO groove traverse adjustment
- E-F balance adjustment
- MO pit traverse adjustment
- CD RF level adjustment
- CD traverse adjustment
- Error rate confirmation

1-3. NOTE ON ADJUSTMENT

- 1) Perform adjustment in the test mode.
Release the test mode after adjustment.
- 2) Adjustment should be performed in order described.
- 3) Use jigs and measurement tools described below.
 - CD test disc TGYS-1 (Part No.: 4-959-188-01)
 - Laser power meter LPM-8001 (Part No.: J-2501-046-A)
 - Error rate counter MDPE-1 (Part No.: J-2501-047-A)
 - Oscilloscope (band more than 40 MΩ, Calibrate the probe before performing the measurement.)
 - Digital voltmeter
 - Temperature meter

1-4. MO CONTINUED RECORDED DISC MAKING

- This disc is used for MO Focus Bias Adjustment and MO Error Rate Confirmation.

The following provides how to make the MO continued recorded disc.

1. Insert a standard product MO disc (blank disc).
2. Play mode switch of the OFF conditions.
3. Press the CUE/STDBY **⏮** key to let "RF mod=MO" appear. (RF mode : MO groove)
4. Press the **⏭** key to move the optical pickup from pit to outer circumference.
5. Press the ENTER key to let "CREC-MIDDLE" appear. (middle circumference continued recording)
6. Press the PLAY/PAUSE **▶||** key to start recording. (End the recording within five minutes.)
7. Press the STOP **■** key to stop the recording.
8. Press the EJECT **▲** key to take out the MO disc.

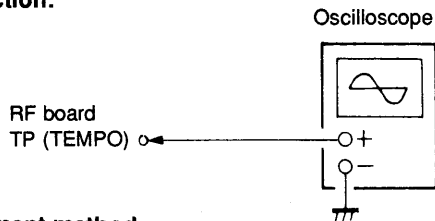
Performing these steps described above permits continued recorded disc for MO focus bias adjustment and MO error rate confirmation.

1-5. OFFSET ADJUSTMENT

Note: This adjustment should be performed immediately after setting the test mode. Performing other adjustments switch the operation mode, and the correct adjustment can not be performed. (Refer to "SECTION 3 TEST MODE" on the MDS-B1/B2P service manual.)

1) Temperature compensation offset adjustment

Connection:



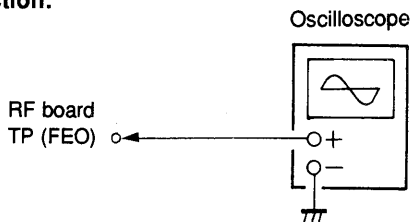
Adjustment method:

1. Connect the oscilloscope to TP (TEMPO) on the RF board.
2. Adjust RV205 on the RF board so that the reading on the oscilloscope meets the specification.

Specification: $0 \pm 50 \text{ mV}$ (25°C)
 $+27 \text{ mV}/^\circ \text{C}$ (Increased by 27mV with every increasing temperature by 1°C)

2) Focus bias offset adjustment

Connection:

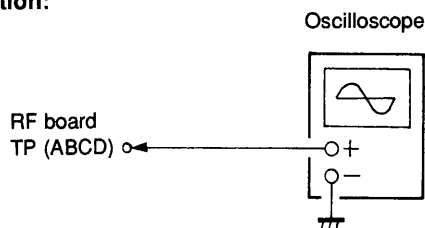


Adjustment method:

1. Connect the oscilloscope to TP (FEO) on the RF board.
2. Adjust RV208 on the RF board so that the reading on the oscilloscope becomes $0 \pm 20 \text{ mV}$.

3) FOK offset adjustment

Connection:

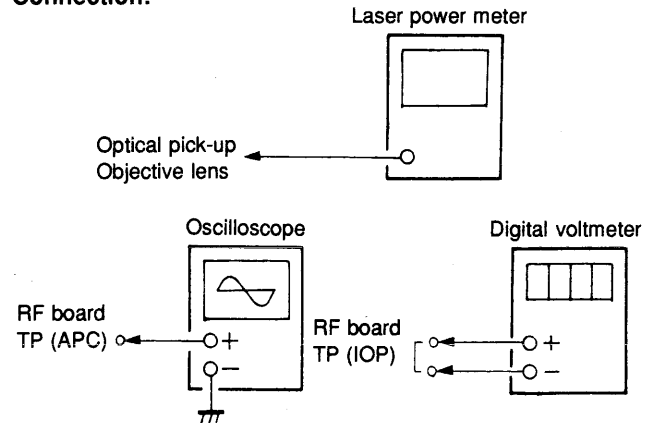


Adjustment method:

1. Connect the oscilloscope to TP (ABCD) (IC209 ③) on the RF board.
2. Adjust RV207 on the RF board so that the reading on the oscilloscope becomes $0 \pm 20 \text{ mV}$.

1-6. LASER POWER ADJUSTMENT

Connection:



Adjustment method:

1. Place the laser power meter on the objective lens of the optical pickup. (If setting can not be made correctly, move the optical pickup using the $\blacktriangleright\blacktriangleright$ or $\blacktriangleleft\blacktriangleleft$ key.)
 Connect the oscilloscope to TP (APC) on the RF board, the digital voltmeter to TP (IOP) respectively.
2. Play mode switch of the OFF conditions.
3. Press the DISPLAY key to let "Laser Power 6F" appear. (laser power : for adjustment)
4. Adjust RV204 on the RF board so that the reading on the laser power meter becomes $3.6 \pm 0.1 \text{ mW}$.
 At this time, confirm that the reading on the oscilloscope is $1.5 \pm 0.1 \text{ V}$.
5. Play mode switch of the OFF conditions.
6. Press the DISPLAY key to let "Laser Power E5" appear. (laser power : MO writing)
7. At this time, confirm that the reading on the laser power meter, oscilloscope and digital voltmeter meet the specifications shown below.

Specifications:

Laser power meter : $7.0^{+0}_{-0.4} \text{ mW}$
 Oscilloscope : $3.0 \pm 0.1 \text{ V}$
 Digital voltmeter : Optical pickup reading $\pm 5 \text{ mA}$

(Optical pickup label)

KMS-140B
 25131
 A1009

In this case : $\text{Iop} = 100.9 \text{ mA}$

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

8. Play mode switch of the OFF conditions.
9. Press the DISPLAY key to let "Laser Power 16" appear. (laser power : MO reading)
10. At this time, confirm that the reading on the laser power meter and oscilloscope become the specifications shown below.

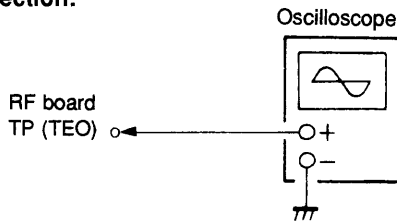
Specifications:

Laser power meter : $0.85 \pm 0.04 \text{ mW}$
 Oscilloscope : $0.37 \pm 0.1 \text{ V}$

11. Press the STOP key to stop the laser emitting.

1-7. MO TRAVERSE ADJUSTMENT

Connection:



Adjustment method:

1. Connect the Oscilloscope to TP (TEO) on the RF board.
2. Insert a MO disc (standard product).
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=MO" appear. (RF mode : MO groove)
5. Move the optical pickup from pit to outer circumference by pressing the **◀◀** or **▶▶** key.
6. Play mode switch of the REPEAT ALL conditions.
7. Press the CUE/STDBY **▶▶** key. (Focus / spindle (S) servo on, tracking servo off)
8. Adjust the RV201 on the RF board so that the waveform of the oscilloscope meets the specification. (MO groove traverse adjustment)

(Traverse waveform)



Specification: A=B

9. Play mode switch of the OFF conditions.
10. Press the DISPLAY key to let "laser Power E5" appear. (laser power : MO writing)
11. Adjust the RV209 on the RF board so that the waveform of the oscilloscope meets the specification. (E-F balance adjustment)

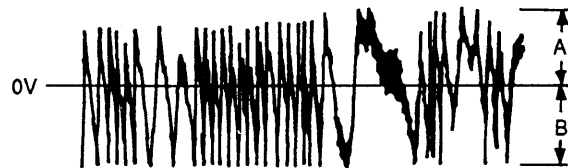
(Traverse waveform)



Specification: A=B

12. Play mode switch of the OFF conditions.
13. Press the DISPLAY key to let "Laser Power 16" and "Laser Power E5" appear alternatively, and repeat adjustment until both offset values meet the specifications.
14. Press the STOP **■** key.
15. Move the optical pickup to the pit portion (inner most circumference) by pressing **◀◀** key.
16. Play mode switch of the OFF conditions.
17. Press the CUE/STDBY **▶▶** key to let "RF mod=MO pit" appear. (RF mode : MO Pit)
18. Play mode switch of the REPEAT ALL conditions.
19. Press the CUE/STDBY **▶▶** key. (Focus/spindle (S) servo on, tracking servo off)
20. Adjust the RV202 on the RF board so that the waveform of the oscilloscope meets the specification. (MO pit traverse adjustment)

(Traverse waveform)

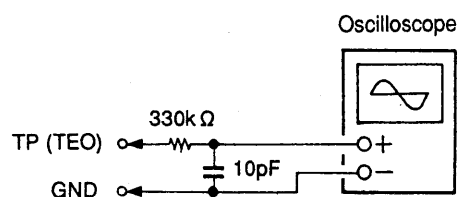


Specification: A=B

21. Press the STOP **■** key.
22. Press the EJECT **▲** key to take out the MO disc.

Note 1: If a recorded disc is used for this adjustment, the data is erased when MO writing.

Note 2: If it is hard to observe the traverse waveform, connect the oscilloscope as shown below. The appearance is improved.

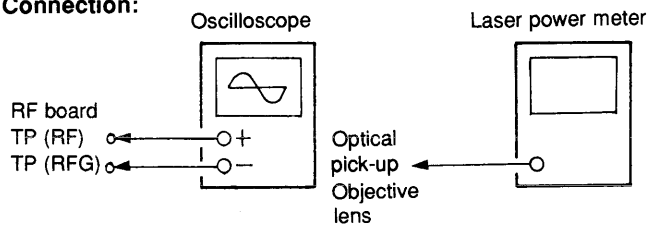


1-8. CD RF LEVEL ADJUSTMENT

Condition:

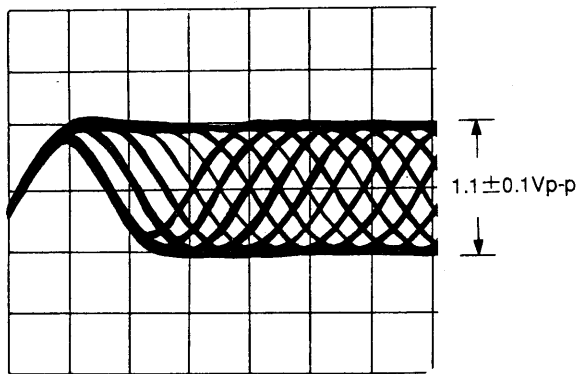
Perform adjustment in the condition where the unit is in horizontal.

Connection:



Adjustment method:

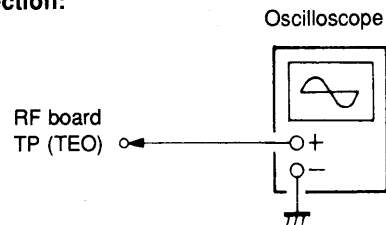
1. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear. (RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to perform repeated playback.
6. Adjust the RV215 on the RF board so that the RF level of the oscilloscope becomes $1.1 \pm 0.1V_{p-p}$.



7. Press the STOP **■** key to stop playback.
8. Press the EJECT **▲** key to take out the test disc.
9. Place the laser power meter on the objective lens of the optical pickup. (If setting can not be made correctly, move the optical pickup using **▶▶** or **◀◀** key.)
10. Play mode switch of the OFF conditions.
11. Press the DISPLAY key to let "Laser Power 0C" appear. (laser power : CD reading)
12. Confirm that the reading of the laser power meter is $0.49 \pm 0.06mW$.
13. Press the STOP **■** key to stop laser diode emitting.

1-9. CD TRAVERSE ADJUSTMENT

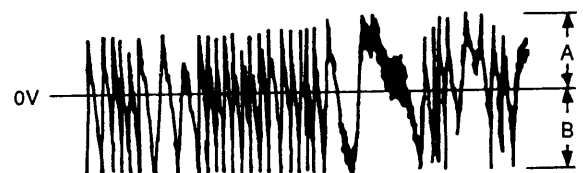
Connection:



Adjustment method:

1. Connect the Oscilloscope to TP (TEO) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear. (RF mode : CD)
5. Play mode switch of the REPEAT ALL conditions.
6. Press the CUE/STDBY **▶▶** key. (Focus/spindle (S) servo on, tracking servo off)
7. Adjust the RV203 on RF board so that the reading on the oscilloscope meets the specification.

(Traverse waveform)



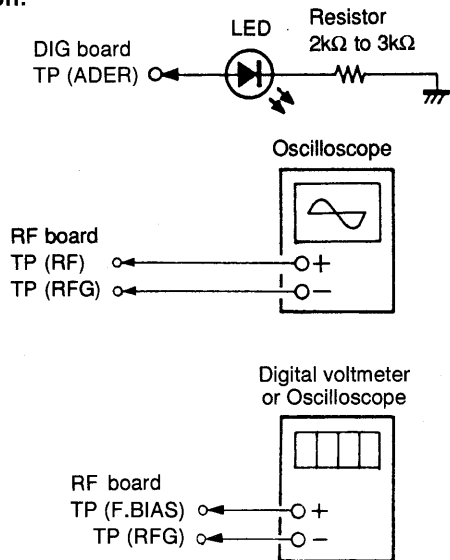
Specification: A=B

8. Press the STOP **■** key.
9. Press the EJECT **▲** key to take out the test disc.

1-10. MO FOCUS BIAS ADJUSTMENT

● Method by means of RF and ADER

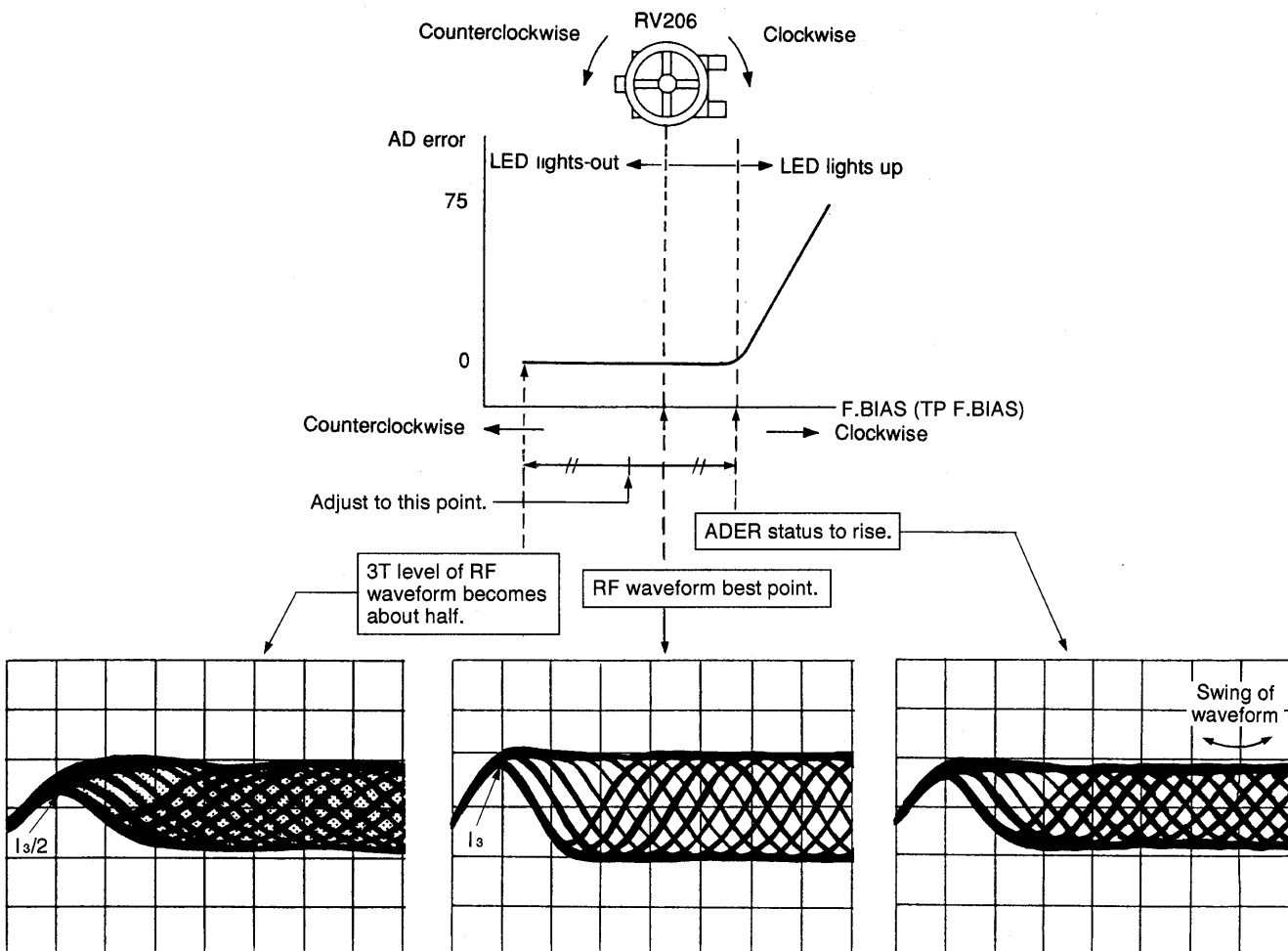
Connection:



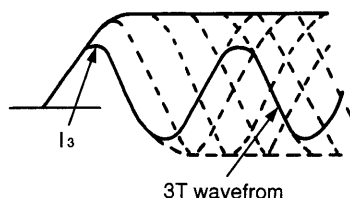
Adjustment method:

1. Connect the LED and resistor (2 to 3k Ω) to TP (ADER) on the DIG board. (Oscilloscope can be connected. "H" if error is present.)
2. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board, and also connect the digital voltmeter or oscilloscope to TP (F.BIAS) and TP (RFG).
3. Insert the continued recorded disc. (Refer to "1-4. MO CONTINUED RECORDED DISC MAKING".)
4. Move the optical pickup toward outside for 1 or 2 seconds to exit from the P-TOC area.
5. Play mode switch of the OFF conditions.
6. Press the CUE/STDBY **II** key to let "RF mod=MO" appear. (RF mode : MO groove)
7. Press the PLAY/PAUSE **II** key to let "C PLAY-MID" appear. (middle circumference repeated playback)
8. Adjust the RV206 on the RF board so that the eye-pattern of the oscilloscope correctly appears. At this time, take a note of I₃ level (3T waveform).
(The correct eye-pattern means that $\diamond$ shape can be identified clearly at the center of waveform.)

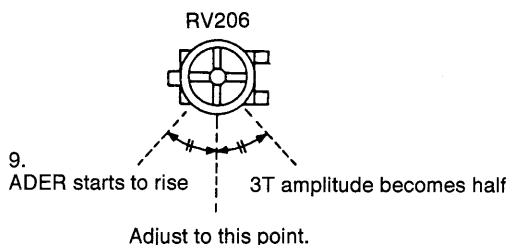
Normally, a relation between the RF waveform and AD error is as follows.



3T waveform



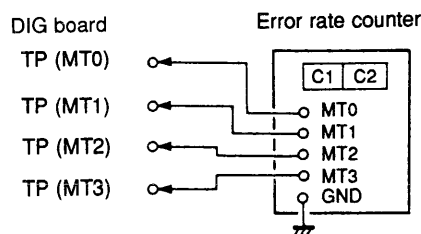
9. Observing the LED and RF waveform on oscilloscope connected to the DIG board, rotate RV206 clockwise, and take a note of voltage at TP (F.BIAS) or mechanical position of RV206 when the ADER starts to rise (LED starts to blink).
10. Observing the RF waveform on oscilloscope, rotate RV206 counterclockwise, and take a note of voltage at TP (F.BIAS) or mechanical position of RV206 when the I₃ level of 3T waveform recorded in step 8 becomes about half.
11. Adjust RV206 to attain center of voltage or mechanical center of those recorded in steps 9 and 10. (See Figure below.)



12. Press the STOP ■ key to stop the playback.
13. Press the EJECT ▲ key to take out the continued recorded disc.

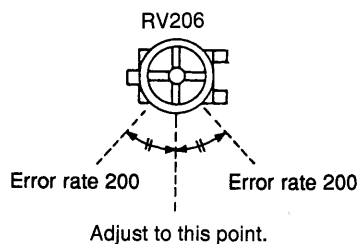
● Method requiring error rate counter

Connection:



Adjustment method:

1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the continued recorded disc. (Refer to "1-4. MO CONTINUED RECORDED DISC MAKING".)
3. Move the optical pickup toward outside for 1 or 2 seconds to exit from the TOC area.
4. Play mode switch of the OFF conditions.
5. Press the CUE/STDBY ► key to let "RF mod=MO" appear. (RF mode : MO)
6. Press the PLAY/PAUSE ► key to let "C PLAY-MID" appear. (middle circumference repeated playback)
7. Turn the RV206 on the RF board so that the error rate (C1) of the error rate counter becomes 200 at two points. Measure these two points and adjust the RV206 to the mechanical center.



8. Press the STOP ■ key to stop the playback.
9. Press the EJECT ▲ key to take out the continued recorded disc.

1-11. CD FOCUS BIAS ADJUSTMENT

● Method requiring no error rate counter

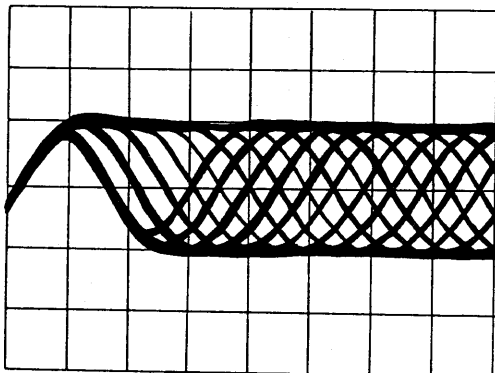
Connection:



Adjustment method:

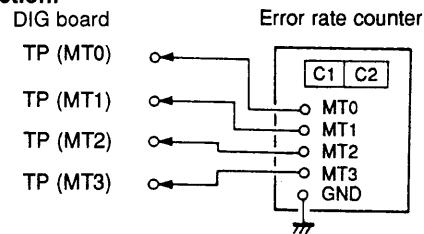
1. Connect the Oscilloscope to TP (RF) and TP (RFG) on the RF board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to perform repeated playback.
6. Adjust the RV212 on the RF board so that the eye-pattern of the oscilloscope correctly appears.
(The correct eye-pattern means that ◇ shape can be identified clearly at the center of waveform.)

An example of RF waveform



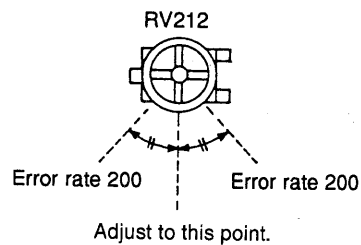
● Method requiring error rate counter

Connection:



Adjustment method:

1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **▶▶** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to let "C PLAY-MID" appear.
(middle circumference repeated playback)
6. Turn the RV212 on the RF board so that the error rate (C1) of the error rate counter becomes 200 at two points. Measure these two points and adjust the RV212 to the mechanical center.

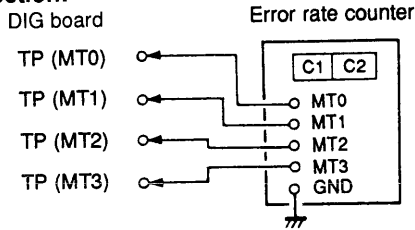


7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **▲** key to take out the test disc.

7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **▲** key to take out the test disc.

1-12. ERROR RATE CONFIRMATION

Connection:



CD error rate confirmation:

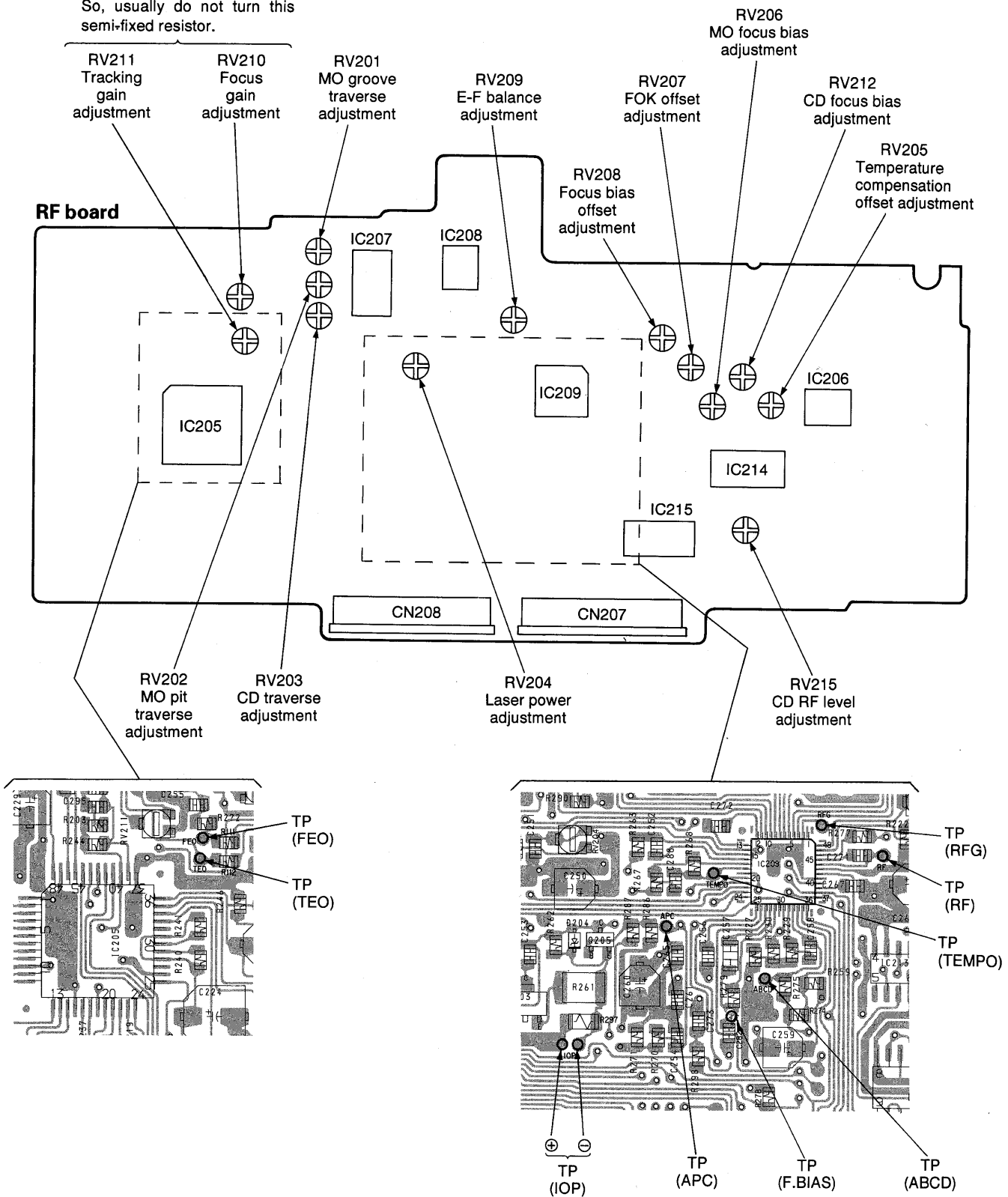
1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the test disc TGYS-1.
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **⏮** key to let "RF mod=CD" appear.
(RF mode : CD)
5. Press the PLAY/PAUSE **▶||** key to let "C PLAY-MID" appear.
(middle circumference repeated playback)
6. Confirm that the error rate (C1) of the error rate counter is less than 20.
7. Press the STOP **■** key to stop the playback.
8. Press the EJECT **▲** key to take out the test disc.

MO error rate confirmation: (MDS-B1 model only)

1. Connect the error rate counter to TP (MT0), TP (MT1), TP (MT2) and TP (MT3) on the DIG board.
2. Insert the continued recorded disc. (Refer to "1-4. MO CONTINUED RECORDED DISC MAKING".)
3. Play mode switch of the OFF conditions.
4. Press the CUE/STDBY **⏮** key to let "RF mod=MO" appear.
(RF mode : MO)
5. Press the **▶▶** key to move the optical pickup from pit to outer circumference.
6. Press the PLAY/PAUSE **▶||** key to let "C PLAY-MID" appear.
(middle circumference continued playback)
7. Confirm that the error rate (C1) of the error rate counter is less than 50.
8. Press the STOP **■** key to stop the playback.
9. Press the EJECT **▲** key to take out the continued recorded disc.

1-13. ADJUSTMENT LOCATION

A servo analyzer is required to perform this adjustment. So, usually do not turn this semi-fixed resistor.



DIG board

