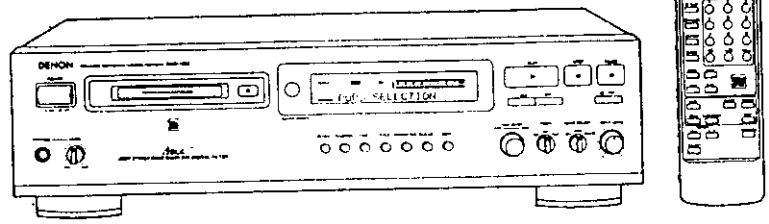
DENON

Hi-Fi Stereo Recorder

SERVICE MANUAL

MODEL DMD-1500

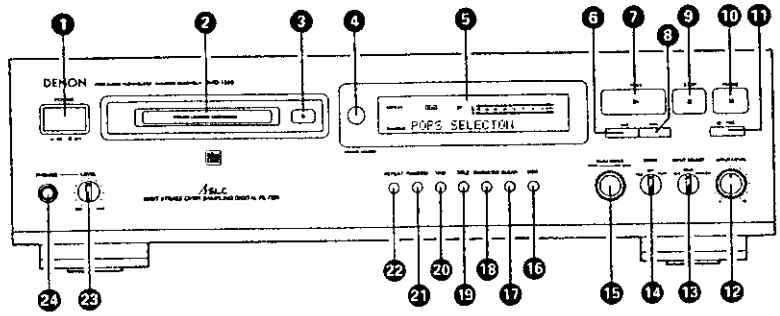
STEREO MD RECORDER



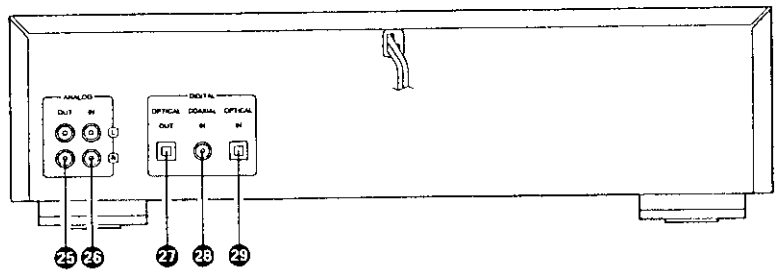
— TABLE OF CONTENTS —

NIPPON COLUMBIA CO., LTD.

FRONT PANEL
FRONTPLATTE
PANNEAU AVANT
FRAMSIDA



REAR PANEL
RÜCKWAND
PANNEAU ARRIERE
BAKSIDA



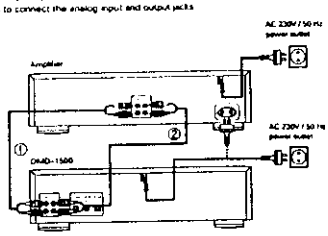
4 CONNECTIONS

NOTE:
- Do not plug in the power cord until all other connections have been made.
  Be sure to interconnect the left (white) and right (red) channels properly, as shown on the diagrams.
- Insert the plugs securely. Incomplete connections may result in noise.
- After unplugging the power cord, wait about 5 seconds before plugging it back in.
- Note that clamping the connection cords (pin-plug cords) together with the power cord may result in humming or noise.

1. Connecting the analog input and output jacks (analog connections)

- Use the included connection cords (pin-plug cords) to connect the analog input and output jacks.

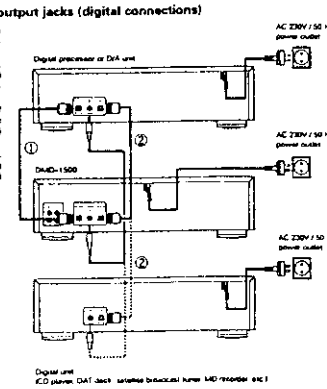
① Connect the left (L) and right (R) analog output (ANALOG OUT) jacks on the DMD-1500 to the left (L) and right (R) tape input (tape playback) jacks on the amplifier.
② Connect the left (L) and right (R) analog input (ANALOG IN) jacks on the DMD-1500 to the left (L) and right (R) tape output (tape recording) jacks on the amplifier.



2. Connecting the digital input and output jacks (digital connections)

Use commercially available optical fiber cords and a 75 Ω/ohms coaxial pin-plug cord to connect the digital input and output jacks.

① Connect the digital output (DIGITAL OPTICAL OUT) jack on the DMD-1500 to the digital optical input of a digital processor or D/A unit. (Use an optical fiber cord.)
② Connect the digital input (DIGITAL OPTICAL IN and COAXIAL IN) jacks on the DMD-1500 to the digital output (OPTICAL OUT and COAXIAL OUT) jacks on a CD player, digital processor or D/A unit. (Use an optical fiber cord to connect the OPTICAL IN and OUT jacks, a 75 Ω/ohms coaxial pin-plug cord to connect the COAXIAL IN and OUT jacks.)



- For information on optical fiber and 75 Ω/ohms pin-plug cords, contact your nearest Denon dealer.

5 PART NAMES AND FUNCTIONS

❶ POWER switch
- When the POWER switch is pressed and set to the ON position [⎓], the power turns on. When pressed again and set to the OFF position [⏻], the power turns off and the standby mode is set.
- Even when the POWER switch is set to the OFF position [⏻], discs are automatically drawn in when they are inserted. Also, when the power cord is plugged into a power outlet after the backup power has turned off when a disc is loaded and the power has not been turned on for 2 or 3 days, the disc is ejected, regardless of whether the POWER switch is at the ON or OFF position.

NOTE:
Power is supplied constantly while the power cord is plugged in.
Disconnect the mains plug from the supply SOCKET when not use.

❷ Disc insertion slot
- When a disc is inserted here, it is automatically drawn into the set.
- Be sure to insert the disc in the proper direction.

★ Cautions on removing MDs
- Do not push the MD back in while it is coming out after pressing the eject button [⏏].

- When the MD is coming out, the mechanism protection function is activated, so the MD cannot be reloaded by pushing it back in. To reload the MD, first wait for it to come completely out, then push it back in.

★ Removing partially inserted discs

- To remove partially inserted discs, first press the disc in fully to load it, then press the eject button.

❸ Eject button [⏏]
- Press this to eject the disc.

❹ REMOTE SENSOR
- Point the remote control unit (RC-257) towards this sensor when operating it.

❺ Display
- See Page 6 for details.

❻ Manual search reverse button [◀◀]
- Press this button to search manually in the reverse direction.
- This button is also used to move the cursor when inputting discs.

❼ Play button [▶ PLAY]
- Press this button to start playback or recording.
- Press this button during recording to add a track number.

❽ Manual search forward button [▶▶]
- Press this button to search manually in the forward direction.
- This button is also used to move the cursor when inputting titles.

❾ Stop button [■ STOP]
- Press this button to stop playback or recording.
- Press this button to clear the editing operation.

❿ Pause button [⏸ PAUSE]
- Press this button to stop playback or recording temporarily.
- Press the play button [● ▶ PLAY] to cancel the pause mode.

⓫ Record button [● REC]
- Press this button to record.
- The recording standby mode is set when the ● REC button is pressed alone.
- Press the play button [● ▶ PLAY] while in the recording standby mode to start recording.
- To stop recording or to cancel the recording standby mode, press the stop button [● ■ STOP].

⓬ Input level adjustment control [INPUT LEVEL]
- Use this to adjust the analog input signal recording level.
- This control does not affect digital recording.

⓭ Input selector [INPUT SELECT]
- Use this to select the input source for recording.
- The input source cannot be switched during recording. To do so, first set the recording standby or stop mode.

⓮ TIMER selector
- Use this for timer recording or playback when using the DMD-1500 with a separately sold audio timer.
- Set the selector to the "OFF" position when not using the timer.

⑮ **Jog dial (PUSH ENTER)**
- Use this dial to find the beginning of tracks and for editing.
- Use this dial to input letters when giving titles to tracks on the disc.
- Press the dial to enter editing settings or to turn the analog ATM (Auto Track Marking) function on and off. (For details on the ATM function, refer to "⑨ Recording" on Page 11.)

⑯ **EDIT button**
- This button is used when inputting disc and track titles and for such editing operations as erasing, dividing, combining and moving tracks.

⑰ **CLEAR button**
- This button is used to correct programmed tracks and to clear title letters and editing operations.

⑱ **CHARACTER button**
- Use this button when inputting titles to switch between capital letters, small letters, special letters and katakana characters.

⑲ **TITLE button**
- Press this button to set the title display mode and display the disc and track titles.

⑳ **TIME button**
- Press this button to switch the time display between the elapsed time, remaining time, total recorded time, total recordable time, etc.

㉑ **RANDOM button**
- Press this button to play the tracks in random order.

㉒ **REPEAT button**
- Use this button to play a single track or all tracks repeatedly.

㉓ **Headphones volume control (LEVEL)**
- Use this to adjust the output level (volume) of the headphones jack (㉔ PHONES).

㉔ **Headphones jack (PHONES)**
- Use this jack to listen with headphones. (Headphones are not included.)

㉕ **Analog output jacks (ANALOG OUT)**
- When these jacks are connected to the tape input (TAPE-PB) jacks on an amplifier, the sound from the DMD-1500 can be heard through the speakers connected to the amplifier.

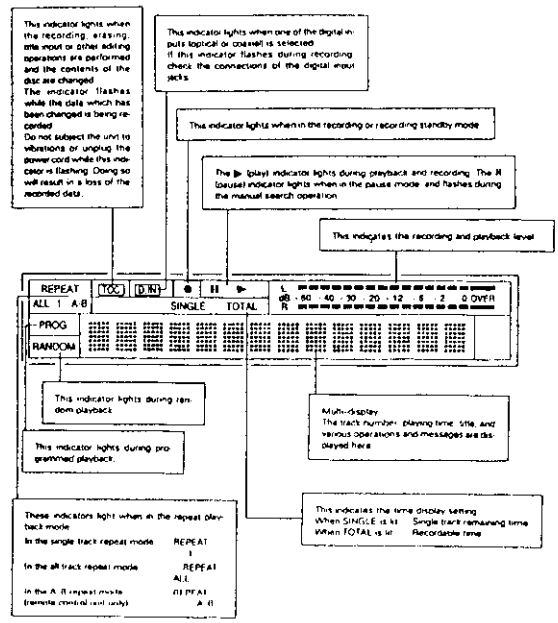
㉖ **Analog input jacks (ANALOG IN)**
- When these jacks are connected to the tape output (TAPE-REC) jacks on an amplifier, the sound of other components connected to the amplifier can be recorded on the DMD-1500. To do so, set the input selector (⑪ INPUT SELECT) to the "ANALOG" position.

㉗ **Digital output jack (DIGITAL OPTICAL OUT)**
- Digital data is output from this jack in the form of optical signals.
- When this jack is connected to the digital input (OPTICAL) jack on a digital processor or D/A unit, the sound from the DMD-1500 can be heard over the speakers.
- For details on the optical fiber cord used for connection, contact your nearest Denon Dealer.

㉘ **Digital input jack (DIGITAL COAXIAL IN)**
- Use this jack to input digital data.
- When connected to the coaxial digital output jack of a CD player, DAT deck, satellite broadcast tuner or another MD recorder, the sound from that unit can be recorded digitally on the DMD-1500. To do so, set the input selector (⑪ INPUT SELECT) to the "COAX" position.
- Use a commercially available 75Ω ohms coaxial pin-plug cord to connect this jack.

㉙ **Digital input jack (DIGITAL OPTICAL IN)**
- Use this jack to input digital data.
- When connected to the optical digital output jack of a CD player, DAT deck, satellite broadcast tuner or another MD recorder, the sound from that unit can be recorded digitally on the DMD-1500. To do so, set the input selector (⑪ INPUT SELECT) to the "OPT" position.
- For details on the optical fiber cord used for connection, contact your nearest Denon Dealer.

❾ **Display**



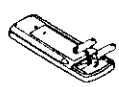
6 REMOTE CONTROL UNIT

★ **The included remote control unit (RC-257) can be used to operate the DMD-1500 from a distance.**

Inserting the batteries

① Remove the remote control unit's back lid.

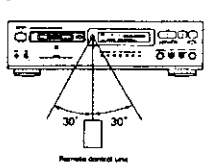
② Insert the two R6P batteries (SUM-3) in the battery compartment, in the direction indicated by the marks inside the compartment.



③ Put the back lid back on.

Cautions on batteries
- Use SUM-3 batteries in the remote control unit.
- The batteries should be replaced with new ones after approximately one year, though this depends on the frequency with which the remote control unit is used.
- Even if the batteries are less than a year old, replace them with new ones if the remote control unit no longer operates even from a short distance from the main unit.
- Be sure to set the batteries in the proper "+" and "−" directions, as indicated by the marks in the remote control unit's battery compartment.
- Remove the batteries when not using the remote control unit for long periods of time.
- To avoid explosions and fluid leakage:
  - Do not use one new battery with one old one.
  - Do not use two different types of batteries.
  - Do not short-circuit, disassemble, heat or dispose of batteries in flames.
- If the battery fluid should leak, wipe all the fluid off the battery compartment, then insert new batteries.

Using the remote control unit

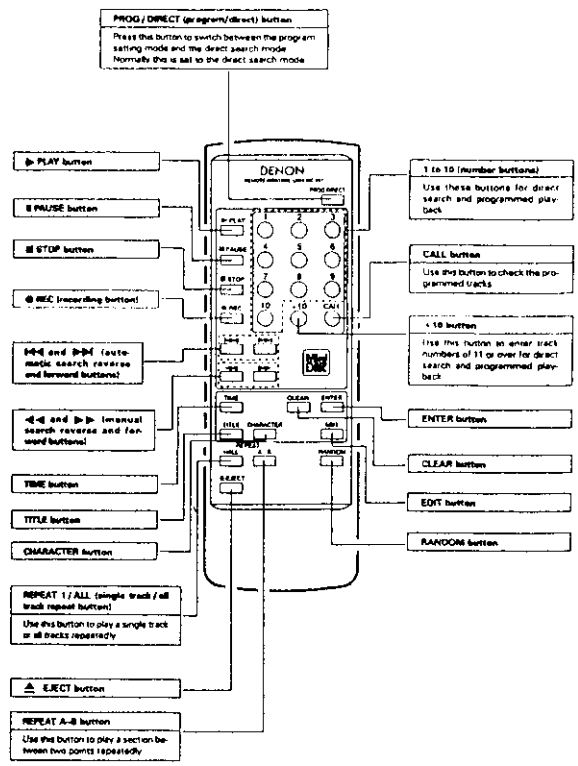


- When operating the remote control unit, point it at the main unit as shown in the diagram. The remote control unit can be operated from a direct distance of approximately 8 meters from the main unit. That distance will be shortened, however, if there are obstacles or when operated from an angle. (The remote control unit will operate from a horizontal angle of up to about 30°.)

NOTE:
- The remote control unit may not operate if the remote sensor is exposed to direct sunlight or strong artificial light, or if there is an obstacle between it and the remote sensor.
- Do not press buttons on the main unit and on the remote control unit at the same time. Doing so will result in malfunction.

Names and Functions of Remote Control Unit Buttons

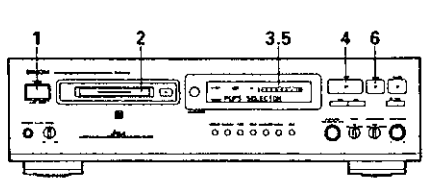
★ **Buttons not explained here function in the same way as the corresponding buttons on the main unit.**



7 NORMAL PLAYBACK

1. Starting playback

First try playing the tracks in order.



1	Turn on the power.
2	Load the disc. • Insert the disc into the disc insertion slot in the direction indicated by the arrows on the top of the disc. The disc is drawn in automatically.
3	The disc title is displayed, then the total number of tracks and the recorded time appear. • The disc title is not displayed if no disc title has been input. POPS SELECTION ⇨ 12Tr 62m 03s
4	Press the play button (▶ PLAY). • Playback begins.
5	The track title is displayed, then the track number and elapsed playing time appear. • The track title is not displayed if no track title has been input. BOY MEETS GIRL ⇨ 01Tr 05m 28s

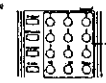
2. Stopping playback

6	Press the stop button (■ STOP). • Playback stops. • The stop mode is set automatically once all the tracks on the disc have been played.

8 VARIOUS PLAYBACK FUNCTIONS

In addition to normal playback, the DMD-1500 also offers the playback functions described below.

1. Playing a certain track (remote control unit only) ..... Direct Search



1	Use the number buttons (1 to 10) and the +10 button to input the number of the desired track. • For example: Press button [5] to listen to the 4th track, buttons [+10] and [2] to listen to the 12th track. Playback begins from that track.

2. Moving to the next track during playback ..... Automatic Search

1	Either turn the jog dial (PUSH ENTER) on the main unit clockwise (↷) or press the ▶▶| automatic search forward button on the remote control unit. • During the search operation, turn the jog dial (PUSH ENTER) on the main unit clockwise (↷) again or press the ▶▶| automatic search forward button on the remote control unit again to move further on to the beginning of the following track.

3. Moving back to the beginning of the track during playback ..... Automatic Search

1	Either turn the jog dial (PUSH ENTER) on the main unit counterclockwise (↶) or press the |◀◀ automatic search reverse button on the remote control unit. • During the search operation, turn the jog dial (PUSH ENTER) on the main unit counterclockwise (↶) again or press the |◀◀ automatic search reverse button on the remote control unit again to move further back to the beginning of previous track.

4. Finding the desired position while listening to the sound ..... Manual Search

- Use this function to skip rapidly through the disc while listening to the sound.
  This function comes in handy when you want to find a certain section within a long track.
- The manual search mode is set when one of the manual search buttons (▶▶| and |◀◀) is pressed and held in during playback. The disc moves slowly at first, then rapidly. Normal playback resumes when the button is released.
- The ▶ (play) indicator flashes when the manual search operation is started from the play mode, and the ■ (pause) indicator flashes when the manual search operation is started from the pause mode.
  (There may be a slight break in the sound when returning to normal playback from the manual search mode.)

(1) Manual search forward

1	During playback, press and hold in the manual search forward button (▶▶|). • The track number and elapsed time of the track being searched are shown on the display. • When the manual search mode is set from the pause mode, no sound is heard, and the disc moves faster than when set from the play mode. • Playback stops at the end of the last track on the disc is reached while pressing the manual search forward button (▶▶|).

(2) Manual search reverse

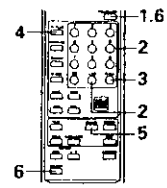
2	During playback, press and hold in the manual search reverse button (|◀◀). • The display is the same as during the manual search forward operation. • When the manual search mode is set from the pause mode, no sound is heard, and the disc moves faster than when set from the play mode. • Manual search stops and playback starts if the beginning of the first track on the disc is reached while pressing the manual search reverse button (|◀◀).

5. Stopping playback temporarily ..... Pause

- Use this function to stop playback temporarily then resume from the same point.

1	Press the pause button (■ PAUSE). • To resume playback, press the play button (▶ PLAY).

6. Playing tracks in a certain order (remote control unit only) ..... Programmed Playback



- Use this function to select certain tracks from the disc and program them to play in a certain order.
- Up to 25 tracks can be programmed.

(1) Setting the program (remote control unit only)

1	In the stop mode, press the program/direct (PROG/DIRECT) button. • The "PROG" indicator lights.
2	Use the number buttons and the +10 button to select the tracks for programmed playback. • For example, to program the 3rd, 12th and 7th tracks, press [PROG/DIRECT], [3], [+10], [2] and [7]. • Each time a track is set, the number of the programmed track and the total program playing time are displayed. After a certain amount of time, the total number of programmed tracks appears.

(2) Checking the programmed tracks (remote control unit only)

3	Press the CALL button. • The programmed tracks appear in the programmed order on the multi-display each time the CALL button is pressed.

(3) Starting programmed playback

4	Press the play button (▶ PLAY). • The tracks are played in the programmed order. • The single track repeat and A-B repeat modes cannot be set during programmed playback.

(4) Correcting the program

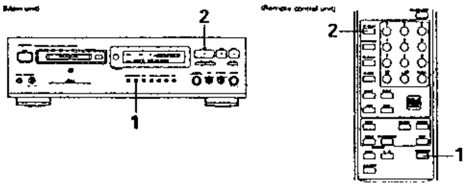
5	In the stop mode, press the CLEAR button, then input the correct track number. • The last programmed track is replaced with the newly input track.

(5) Clearing the entire program

6	In the stop mode, press the PROG/DIRECT button or the eject button (⏏). • The entire program is cleared.

7. Playing in random order .... **Random Playback**

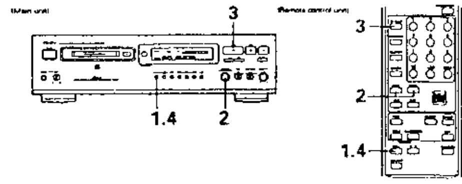
• Use this function to play all the tracks on the disc once in random order

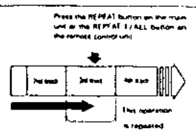


1	In the stop mode, press the RANDOM button • The "RANDOM" indicator lights • To cancel random playback, press the RANDOM button again while in the stop mode.
2	Press the play button (▶ PLAY) • The tracks are automatically selected and played in random order • If the RANDOM button is pressed while in the all track repeat mode, all the tracks are played once in random order, then played again in a different order.

NOTE:
• The single track repeat and A – B repeat modes cannot be set during random playback

8. Playing a single track repeatedly .... **Single Track Repeat**



1	Press the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit • The "REPEAT 1" indicators light on the display and the single track repeat mode is set
2	Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to select the track to be played repeatedly
3	Press the play button (▶ PLAY) • Playback starts • Once the selected track ends, it is played again from the beginning • The single track repeat mode can also be set by pressing the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit during playback. The current track is played repeatedly 

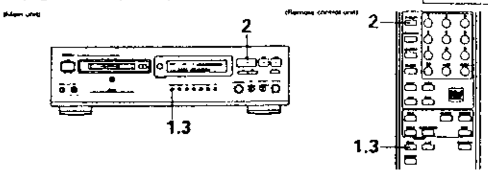
◆ **Canceling the single track repeat mode**

4	Press the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit repeatedly until the "REPEAT" indicator turns off

NOTE
• The single track repeat mode cannot be set during programmed playback or random playback

10

9. Playing all tracks repeatedly .... **All Track Repeat**



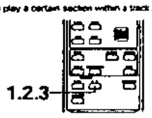
1	Press the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit twice • The "REPEAT ALL" indicators light on the display and the all track repeat mode is set
2	Press the play button (▶ PLAY). • The disc is played repeatedly. • The all track repeat mode can also be set by pressing the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit twice during playback. • If the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit is pressed during programmed playback, the tracks are played repeatedly in the programmed order

◆ **Canceling the all track repeat mode**

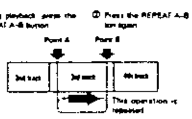
3	Press the REPEAT button on the main unit or the REPEAT 1/ALL button on the remote control unit until the "REPEAT" indicator turns off

10. Playing a certain section repeatedly (remote control unit only) .... **A—B Repeat**

• This function allows you to play a certain section within a track repeatedly. Use it for karaoke or instrument practice.



1	While listening to the sound being played, press the REPEAT A – B button at the position at which you want to start repeating (point A). • The "REPEAT A-" indicators light on the display.
2	Press the REPEAT A – B button at the end of the section you want to play repeatedly (point B). • The "REPEAT A-B" indicators light on the display, the pickup returns to point A, and repeat playback begins.



◆ **Canceling the A-B repeat mode**

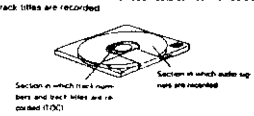
3	Press the REPEAT A-B button again • The "REPEAT A-B" indicators turn off and normal playback resumes

NOTE:
• The A-B repeat mode cannot be set during programmed playback and random playback.
• Points A and B must be in the same track.

9 RECORDING

Recording on discs

Mini-discs include a section in which the audio signals are recorded and a section in which such data as track numbers and track titles are recorded

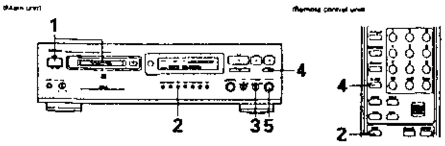


■ **The TOC**

With mini-discs, after the audio signals are recorded, data used for checking the tracks (TOC — Table of Contents) is also recorded on the disc. This TOC data is used when playing the disc. In addition, editing is performed by rewriting the TOC data.
The DMD-1500 is designed so that the TOC data is recorded on the disc when the POWER switch is pressed to turn off the power and when the eject button (⏏) is pressed. The "TOC" indicator flashes while the TOC data is being recorded. Do not subject the recorder to shocks while the [TOC] indicator is flashing. If the data is not recorded properly, it will not be possible to play the disc.

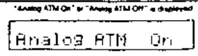
• When recording on an already recorded disc, recording automatically starts from the end of the section last recorded. When doing so, pay attention to the remaining time.
• To clear the entire content of the disc and record from the beginning, first erase the entire disc. (For instructions on erasing the entire disc, refer to " 12 Editing " on Page 14.)
• To record on a disc, make sure the accidental erasure prevention tab is closed and the hole is covered.

1. Preparations for recording



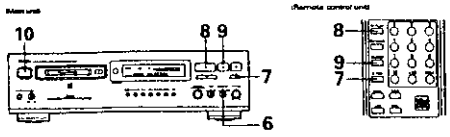
1	Turn on the power and insert the mini-disc on which you want to record.
2	When using an already recorded mini-disc, press the TIME button to check the recordable time • The time display switches between the total recorded time and the recordable time each time the TIME button is pressed

(1) **Analog recording**

3	Set the input selector (INPUT SELECT) to the "ANALOG" position • "Analog ATM On" or "Analog ATM Off" appears on the multi-display • When the analog A.T.M. (Auto Track Marking) function is on (when "Analog ATM On" is displayed): Track numbers are automatically added when soundless sections are detected in the recording input signal • When the analog A.T.M. function is off (when "Analog ATM Off" is displayed): Track numbers are not automatically added. (For instructions on adding track numbers, refer to " 12 Editing — (2) Dividing tracks" on Page 15.) • Press the dial to enter editing settings or to turn the analog ATM (Auto Track Marking) function on and off "Analog ATM On" or "Analog ATM Off" is displayed 
4	Press the record button (● REC) • The recording indicator lights and the recording standby mode is set
5	Use the INPUT LEVEL control to adjust the recording level. • Adjust the INPUT LEVEL control so that the "OVER" indicator does not light even when the volume is loudest. After adjusting, set the standby mode at the beginning of the track you want to record

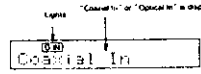
NOTE:
• During digital recording from CDs or mini-discs, the track number may not change if the same track is programmed twice in a row or if the single track repeat mode is set.
• Monaural recording is not possible on this recorder

11



(2) Digital recording

6	Set the input selector (INPUT SELECT) to the "COAX" or "OPT" position. • "Coaxial In" or "Optical In" appears on the multi-display.
7	Press the record button (● REC). • If the "ON" indicator is flashing, check the connections to the digital input jacks.



2. Starting recording

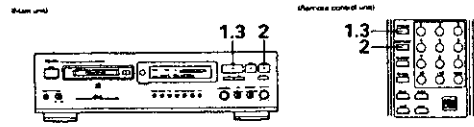
8	Press the play button (▶ PLAY). • Recording starts. • Start playing the track you want to record.

3. Stopping recording

9	Press the stop button (■ STOP). • The stop mode is set automatically once the end of the recordable time is reached.
10	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while the indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.

NOTE:
- When performing digital recording, there is no need to adjust the recording level. The position of the INPUT LEVEL control does not affect the recording level.
- When performing digital recording of CDs or mini-discs, the track numbers are recorded automatically. (Depending on the recorded content on the CD or mini-disc and on the type of CD player, the track numbers may differ from those on the original CD or mini-disc.)
- It is not possible to make digital recordings of mini-discs which have already been recorded digitally. The DMD-1500 includes a serial copy management system. This system limits reproduction of digital signals on digital audio devices to "one generation". Use analog recording to record mini-discs originally recorded digitally.
- The DMD-1500 is equipped with a sampling rate converter which converts the sampling frequency of sources whose sampling frequency is different from that of mini-discs (44.1 kHz), such as DATs and satellite broadcasts (32 kHz and 48 kHz), to 44.1 kHz when recording.
- When recording DATs digitally, track numbers are automatically added when soundless sections are detected when the sampling frequency is other than 44.1 kHz.
- Use analog recording to record sources that cannot be recorded digitally.

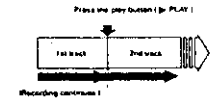
10 VARIOUS RECORDING FUNCTIONS



1. Adding track numbers during recording

- Track numbers can be added during recording regardless of the recording mode (Analog ATM on/off, Digital).

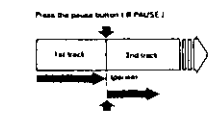
1	Press the play button (▶ PLAY). • When the play button (▶ PLAY) is pressed during recording, a track number is added at that point. • It is not possible to add another track number less than 2 seconds after a track number has been added.



2. Stopping recording temporarily

- Recording can be stopped temporarily then resumed from the same point.

2	Press the pause button (⏸ PAUSE). • When the pause button (⏸ PAUSE) is pressed during recording, the pause mode is set at that point and the track number changes.
3	Press the play button (▶ PLAY) to resume recording.

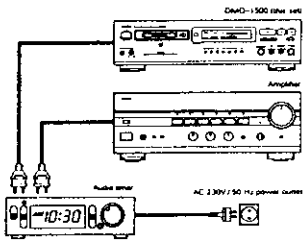


NOTE:
- The DMD-1500 is designed so that the TOC data is recorded on the disc when the POWER switch is pressed to turn off the power and when the eject button (⏏) is pressed.
- After recording, press the eject button (⏏) to record the TOC data before performing other operations.
- The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while this indicator is flashing. Doing so will result in a loss of the recorded data.

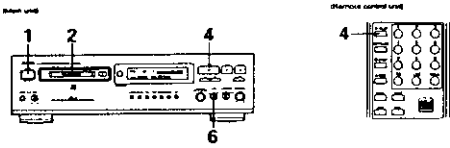
11 TIMER PLAYBACK AND RECORDING

- A separately sold audio timer can be used to start playback or recording at a specific time.
- Also refer to the operating instructions for the audio timer and amplifier.

1. Connections

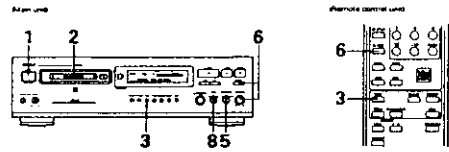


2. Timer playback



1	Turn on the power of the DMD-1500 and the connected components.
2	Load the mini-disc for timer playback into the DMD-1500.
3	Set the tape monitor button or the input selector button on the amplifier or receiver to the input source for the DMD-1500.
4	Press the play button (▶ PLAY). • Play the disc to check the volume.
5	Set the audio timer for the desired time.
6	Set the DMD-1500's TIMER selector to "PLAY". • When the set time is reached, the power turns on and playback begins.

3. Timer recording



1	Turn on the power of the DMD-1500 and the connected components.
2	Load the mini-disc for timer recording into the DMD-1500.
3	When using an already recorded mini-disc, press the TIME button to check the recordable time.
4	Set the input selector button on the amplifier or receiver to the source to be recorded.
5	Set the input selector (INPUT SELECT) on the DMD-1500 to the source to be input.
6	Press the record button (● REC). • Set the recording pause mode and check the recording level.
7	Set the audio timer for the desired time.
8	Set the DMD-1500's TIMER selector to "REC". • When the set time is reached, the power turns on and recording begins.

NOTE:
- The recording mode using timer recording is stored on the disc the next time the power is turned on. During this, the TOC indicator flashes. Do not subject the unit to vibrations or unplug the power cord while this indicator is flashing.
- To operate the DMD-1500 again after timer recording, first eject the disc, then reload it.
- The recording mode using timer recording may be cleared if the DMD-1500's power is not turned on for 2 or 3 days. Be sure to turn on the DMD-1500 within 2 or 3 days.
- Be sure to set the DMD-1500's TIMER selector to the "OFF" position when not using timer playback or recording.
- It takes several seconds from the time the timer recording start time is reached until the power is turned on and recording actually starts. Take this into consideration when setting the timer's start and stop times.
- The recordable time may be shortened by several seconds when using timer recording on discs on which editing (erasing tracks, etc.) has been performed repeatedly.
- Only the TIME button and the POWER switch will function during timer recording.
- To stop recording during timer recording, set the TIMER selector to "OFF", then press the stop button (■ STOP).
- Timer recording is not possible when the disc's accidental erasure prevention tab is open or when the disc is already full ("Disc Full").
- The DMD-1500 is set to the following modes when the power cord is plugged in (and the main power switch on the rear panel is turned on).
  1) When the POWER switch is at the OFF position (⏻):
  2) When the POWER switch is at the ON position (—):
  a) If the TIMER selector is at "PLAY": Timer playback begins.
  b) If the TIMER selector is at "OFF": The stop mode is set automatically.
  c) If the TIMER selector is at "REC": Timer recording begins.
  However, if the DMD-1500's power has not been turned on for 2 or 3 days, the disc may automatically be ejected and timer playback or recording not performed. If this happens, turn on the DMD-1500's power before performing timer playback or recording.

12 EDITING

The editing functions can be used to add track numbers, combine tracks, erase unwanted sections, etc. It is also possible to give titles to discs and tracks.
Use the editing functions to get the best of the excellent operability that mini-discs offer.

1. Editing

The DMD-1500 is equipped with the following four editing functions:

Editing functions

ERASE	DIVIDE	COMBINE	MOVE
• Erasing single tracks • Erasing all tracks	• Dividing tracks	• Combining trace	• Moving tracks

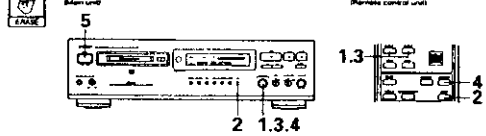
These four editing functions can be combined for a variety of editing possibilities. Press the EDIT button to switch between the editing functions.

• When editing or adding titles, close the accidental erasure prevention tab to cover the hole.

(1) Erasing tracks

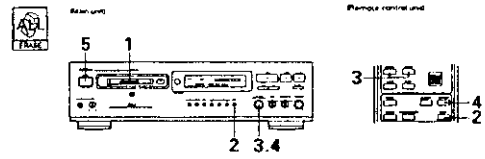
• Once a track is erased, it can no longer be retrieved. Be sure to check the track before erasing it.

[Erasing one track at a time]



1	In the stop mode, display the number of the track to be erased. • Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display the number of the track to be erased. • This step is unnecessary when you want to erase the currently playing or paused track.
2	Press the EDIT button. • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or press one of the automatic search buttons (⏮ and ⏭) on the remote control unit. • Display "Track Erase?".
4	Press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • Pressing the jog dial (PUSH ENTER) or ENTER button sets the erasing operation and erases the track. • "Complete" is displayed then turns off, and the specified track is erased. • The unit is set back to the stop mode when the erasing operation is completed. • In the play or pause mode, the current track is erased. • When a track is erased, the numbers of the following tracks are decreased by one. • When erasing two or more tracks, start from the track with the largest number, since the numbers of the following tracks decrease when a track is erased.
5	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations or unplug the power cord while this indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.
• The erasing operation can be canceled by pressing the stop button (■ STOP) or CLEAR button and turning off the "Track Erase?" display before pressing the jog dial (PUSH ENTER) or ENTER button in step 4.	

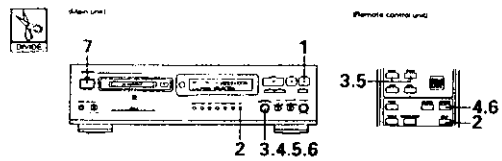
[Erasing all tracks]



1	Load the disc you want to erase.
2	In the stop mode, press the EDIT button. • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or press one of the automatic search buttons (⏮ and ⏭) on the remote control unit. • Display "ALL Erase?".
4	Press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • The "Erase OK?" message appears. • If it is OK to erase all the tracks, press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit.
5	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while the indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.
• To cancel the erasing operation, press the stop button (■ STOP) or CLEAR button to turn off the "ALL Erase?" or "Erase OK?" display. • When the all erase function is used, both the tracks and the disc titles are erased.	

(2) Dividing tracks

• A recorded track can be divided, adding a new track number to the second part.
• Use this function to add a track number at the desired position to make it easy to search for that position.

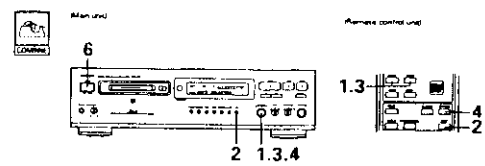


1	Set the pause mode at the position at which you want to divide the track.
2	Press the EDIT button. • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or press one of the automatic search buttons (⏮ and ⏭) on the remote control unit. • Display "Divide?".
4	Press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • A section of approximately 4 seconds starting from that position is played repeatedly and "Position OK?" is displayed.
5	Turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to fine-adjust the dividing position. • The section being played repeatedly can be fine-adjusted within a range of −128 to +127 points (1 point corresponds to approximately 0.06 seconds). • "Position ± (no. points)" is displayed.
6	If it is OK to divide the track, press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • A track can also be divided in the same way during playback by pressing the EDIT button. In this case, the track is divided at the point at which the ENTER button is pressed. • Press the stop button (■ STOP) or CLEAR button to cancel the dividing operation. • To put a divided track back together, see "(3) Combining tracks" on Page 15.
7	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while this indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.

(3) Combining tracks

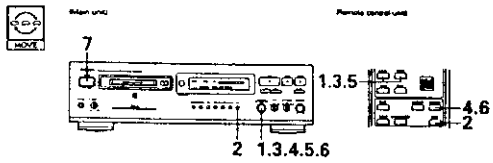
• Use this function to combine two adjacent tracks.

[Combining two adjacent tracks]



1	In the stop mode, display the number of the second of the adjacent tracks. • Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display the number of the second track.
2	Press the EDIT button. • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or press one of the automatic search buttons (⏮ and ⏭) on the remote control unit. • Display "Combine?".
4	If it is OK to combine the tracks, press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • Press the stop button (■ STOP) or CLEAR button to cancel the combining operation.
5	To divide tracks that have been combined: • See "(2) Dividing tracks" on Page 15.
6	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while this indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.
• Tracks can also be combined in the same way during the play or pause modes by pressing the EDIT button. In this case, the track at the point where the jog dial (PUSH ENTER) or ENTER button is pressed is combined with the previous track. • Note that the track numbers change when tracks are combined during playback.	

(4) Moving tracks



1	In the stop mode, display the number of the track to be moved. • Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display the number of the track to be moved.
2	Press the EDIT button. • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or press one of the automatic search buttons (⏮ and ⏭) on the remote control unit. • Display: "Move?"
4	Press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • Display: "007/Move 007".
5	Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to specify the position to which the track is to be moved. • This position will be the track's number after it is moved.
6	To move the track, press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • Press the stop button (■ STOP) or CLEAR button to cancel the moving operation.
7	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while the indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.

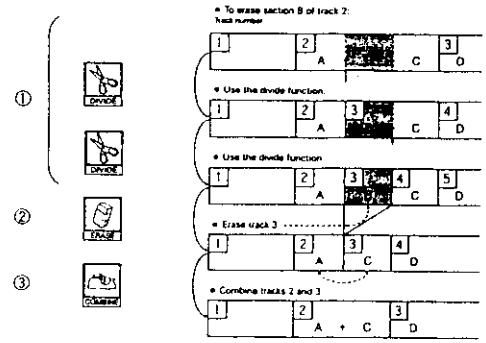
2. Examples of editing applications

The four editing functions can be combined for a variety of editing possibilities. Here we give two examples. Use these as reference to make your own original discs.

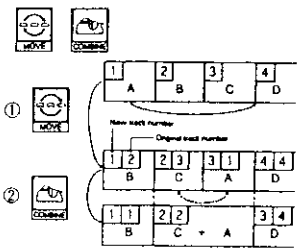
[Erasing part of a track]

To erase part of a track, give a track number to the section you want to erase, then erase that track number.

① Isolate the section of the track you want to erase by giving it a track number. (Divide function)
② Erase the section to which you have given a track number. (Erase function)
③ Combine parts A and C of the original track. (Combine function)



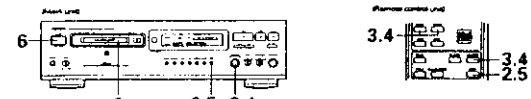
[Combining two non-adjacent tracks]

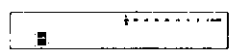
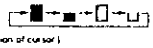


3. Adding titles

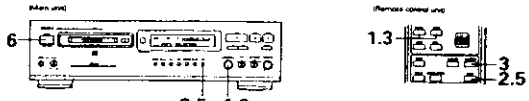
• Track and disc titles with up to 100 characters can be added.

(1) Adding disc titles



1	Load the disc to which you want to give a title.
2	Press the EDIT button after the total number of tracks on the disc and the total playing time are displayed (in the stop mode). • "Edit Mode" is displayed.
3	Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display "Disc Name In?", then press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit. • The cursor flashes, indicating the title input standby mode. 
4	Input the title. • Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to select the desired character. • Some characters that can be input on the DMD-1500 cannot be displayed on other models.  • The shape of the cursor changes each time the CHARACTER button is pressed.  (Explanation of cursor) ■ Capital letter / number input mode ■ Small letter / number input mode □ Special character input mode ␣ Katakana (Japanese character) input mode [Available characters and numbers] Capital letter / number input mode A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5 6 7 8 9 Small letter / number input mode a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 Special character input mode Space ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [¥] ^ _ ` {	} ~ Katakana (Japanese character) input mode ｱ ｲ ｳ ｴ ｵ ｶ ｷ ｸ ｹ ｺ ｻ ｼ ｽ ｾ ｿ ﾀ ﾁ ﾂ ﾃ ﾄ ﾅ ﾆ ﾇ ﾈ ﾉ ﾊ ﾋ ﾌ ﾍ ﾎ ﾏ ﾐ ﾑ ﾒ ﾓ ﾔ ﾕ ﾖ ﾗ ﾘ ﾙ ﾚ ﾛ ﾜ ｦ ﾝ ｧ ｨ ｩ ｪ ｫ ｬ ｭ ｮ ｯ ｰ ﾞ ﾟ • When the manual search forward button (⏭) or the ENTER button is pressed, the selected character is set, and the unit is set to the input standby mode for the next character. • The cursor can be moved back by pressing the manual search reverse button (⏮). Use this to correct input characters. • To erase a character, move the cursor to that character then press the CLEAR button. To correct a character, first erase it, then input the correct character.
5	Set the input title. • Press the EDIT button again to set the input title.
6	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while this indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.

(2) Adding track titles



1	In the stop mode, either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display the track number.
2	Press the EDIT button. • "Edit Mode" is displayed. • In the play, pause or recording modes, press the EDIT button to give a title to the current track.
3	Either turn the jog dial (PUSH ENTER) on the main unit or use the automatic search buttons (⏮ and ⏭) on the remote control unit to display "Track Name In?", then press the jog dial (PUSH ENTER) on the main unit or the ENTER button on the remote control unit.
4	Input the title. • For instructions, see step 4 under "(1) Adding disc titles" on Page 17.
5	Set the input title. • Press the EDIT button again to set the input title. • In the play or recording mode, when adding the title before the track ends: If the track changes, the characters that have been input up to that point are no longer valid.
6	Press the POWER switch to turn the power off. • The TOC data is recorded and the power turns off. The TOC indicator flashes while the TOC data is being recorded. Do not subject the unit to vibrations, turn off the main power switch on the rear panel or unplug the power cord while the indicator is flashing. Doing so will result in a loss of the recorded data. • The TOC data can also be recorded by pressing the eject button (⏏) to eject the disc.

NOTE:
• Katakana titles added on the DMD-1500 will not be displayed properly on units not compatible with katakana. They may also not be displayed properly on some units that are katakana compatible.

13 MESSAGES

Messages may appear on the display while using the DMD-1500. The meanings of these messages are explained below.

Message	Meaning
Blank Disc	Nothing is recorded on the loaded disc.
Complete	Editing is completed.
Copy Prohibit	The SCMS (Serial Copy Management System) prohibits digital copying of that source.
Digital Unlock	During digital recording, this indicates that signals are not being input properly due to incomplete connection of the digital input jacks, etc.
Disc Error	Problem with the disc. (Disc is damaged or there is a problem with the TOC data.)
Disc Full	There is no remaining time on the disc. There are already 255 tracks on the disc.
Impossible	This indicates that the editing operation is not possible.
No Name	This means that no title has been input.
No Track	The disc has a title but no tracks on it.
Playback Only	This appears when you try to record or edit on a disc for playback only.
Protected	The disc is protected against accidental erasure.

14 SYSTEM LIMITATIONS

The recording method used on mini-disc (MD) systems is different from conventional recording methods. Because of this, there are several system limitations.
Note that the following are not malfunctions.

1. Track number limitations

- Up to 255 tracks can be recorded on blank discs or discs with no tracks on them when the tracks are recorded in order starting from track 1. If a disc has been edited repeatedly, however, it may not be possible to record 255 tracks on the disc.
- If there is peripheral data or other signals between tracks during digital recording, this will be treated as a break within the track (the track number will not change), and recording may not be possible, regardless of the recording time or number of tracks.

2. Recording limitations

- If 255 tracks are already recorded on the disc, no further recording is possible, even if the recorded time is less than the maximum recordable time.
- In some cases, the disc's remaining time may not increase when short tracks (only several seconds in length) are erased.
- Recording is performed in units of about 2 seconds. About 2 seconds of disc space is used even if the section is less than 2 seconds long. Thus, the actual recordable time becomes shorter.
- If there are scratches on the disc, recording is not possible in the scratched sections, and the recordable time decreases accordingly.
- When digitally recording CDs, depending on the recording on the CD, blank sections of several seconds may be created and the number of tracks may differ from the number on the original CD.
- When the analog A.T.M. function is on and track numbers are added automatically, the track numbers may not be added properly, depending on the original recording.
- In some cases, the remaining time may not decrease when short tracks are erased. This is because sections of 12 seconds and less are ignored when displaying the remaining time on the MD.

3. Editing limitations

- In some cases it is not possible to combine short tracks created through editing.
- There may be breaks in the sound during manual search on mini-discs which have been recorded or edited repeatedly.

15 TROUBLESHOOTING

Check the following before assuming there is a problem with the set.

- Are connections proper?
- Are you operating as described in these operating instructions?
- Be sure to check that the main power switch on the rear panel is turned on.

If the set does not seem to be operating properly, check the items listed on the table below.
If the cause of the problem cannot be found, the set may be malfunctioning. Immediately turn off the power and unplug the power cord, then contact your store of purchase or your nearest Denon dealer.

Problem	Cause	Measure	Page
Set does not operate.	• No disc is loaded. • Disc is damaged or dirty.	• Load a disc. • Replace with another disc.	9
Disc does not play.	• Connections are wrong. • Nothing is recorded on the disc. ("Blank Disc" or "No Track" is displayed.)	• Check the connections. • Replace with a recorded disc.	5 15
Recording is not possible.	• Disc is protected. ("Protected" is displayed.)	• Move the disc's accidental erasure protection tab to cover the hole.	4, 18
	• There is no remaining time on the disc. ("Disc Full" is displayed.)	• Replace the disc. If there are any sections you do not need, erase them to increase the recording time.	18
	• 255 tracks are already recorded on the disc. ("Disc Full" is displayed.)	• Replace the disc. If there are any tracks you do not need, erase them to increase the recording time.	18
	• You are attempting to digitally record a digital source. (See the description of the SCMS system.) ("Copy Prohibit" is displayed.)	• Use analog recording.	11, 12
	• The input selector (INPUT SELECT) is not set properly.	• Check the recording input mode.	11
	• The INPUT LEVEL control is turned down.	• Adjust the INPUT LEVEL control for analog recording level.	11

MAIN SPECIFICATIONS

Type:	Mini-disc digital audio system
Wow & flutter:	Below measurable limits (±0.001% W. peak or less)
Sampling frequency:	44.1 kHz
Recording method:	Magnetic modulation overwriting
Light source:	Semiconductor
Power supply:	AC 230 V, 50 Hz
Power consumption:	17 W
Maximum external dimensions:	434 (width) × 114 (height) × 290 (depth) mm (including feet, controls and terminals)
Weight:	4.3 kg
■**Remote control unit:**	(RC-257)
Remote control method:	Infrared pulse
No. buttons:	31
Power supply:	DC 3V using two R6P (SUM 3) batteries
Maximum external dimensions:	60 (width) × 177 (height) × 18 (depth) mm
Weight:	100 g (including batteries)

• For improvement purposes, specifications and design are subject to change without notice.

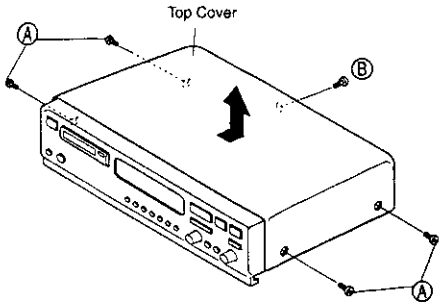
"US and foreign patents licensed from Dolby Laboratories Licensing Corporation"

DISASSEMBLY

(Perform reverse method when assembling.)

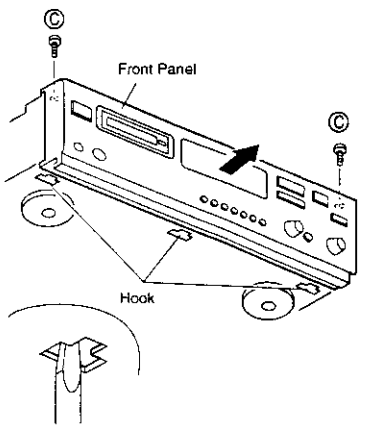
1. Top Cover

(1) Remove 4 screws Ⓐ mounting both sides of the top cover and a screw Ⓑ fixing the rear side of the top cover.
(2) Remove the top cover by lifting in the arrow direction.



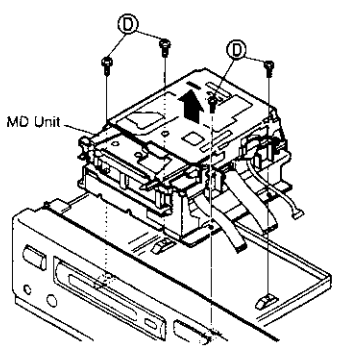
2. Front Panel Ass'y

(1) Remove 2 screws Ⓒ mounting the top of the front panel.
(2) While disengaging 3 hooks at the lower side of the front panel detach the front panel in the arrow direction.



3. MD MECHANISM Unit

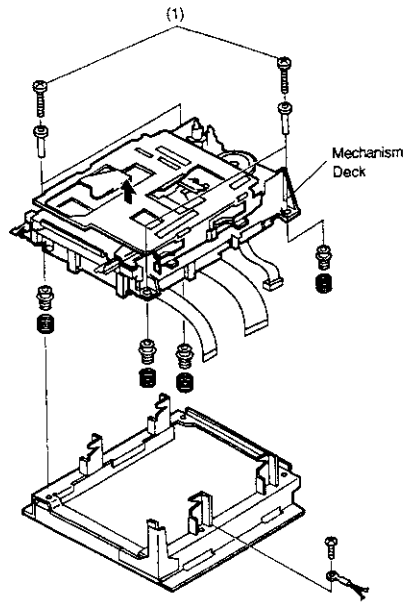
(1) Remove 4 screws Ⓓ fixing the MD unit.
(2) Dismount the MD unit in the arrow direction.



MD MECHANISM UNIT

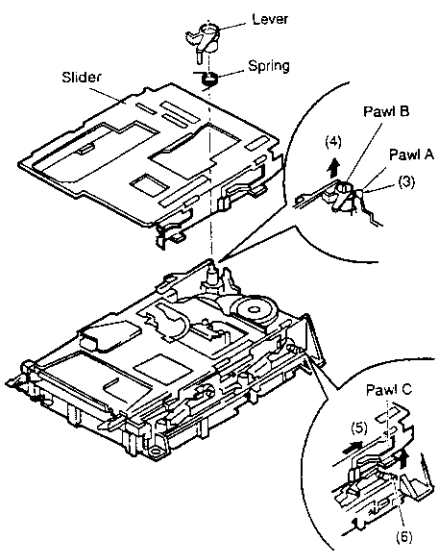
1. Mechanism Deck

(1) Remove 4 screws fixing the mechanism deck.
(2) Detach the mechanism deck in the arrow direction.



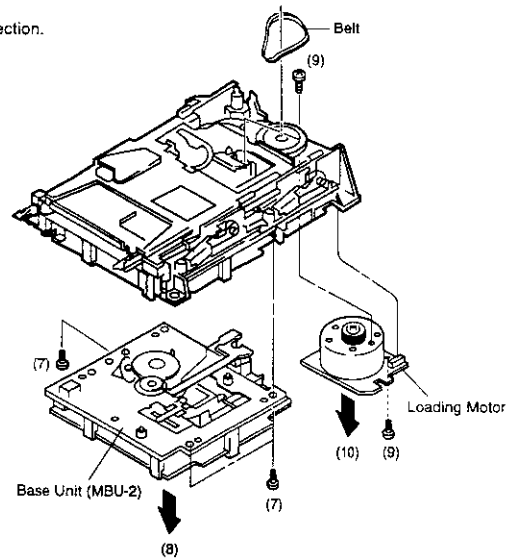
2. Slider

(3) Disassemble the spring from the pawl A.
(4) While releasing the pawl B disassemble the lever in the arrow direction.
(5) Move the pawl C of the slider in the arrow direction until bumping the base slot.
(6) Disassemble the slider in the arrow direction.



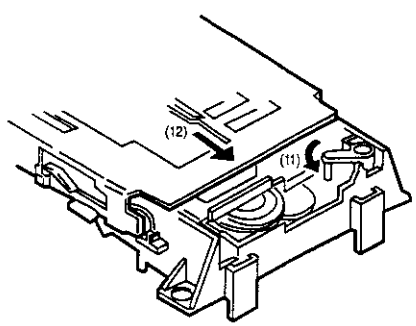
3. Base Unit and Loading Motor

(7) Remove 3 screws mounting the base unit.
(8) Detach the base unit in the arrow direction.
(9) Remove 2 screws fixing the loading motor.
(10) Disassemble the loading motor in the arrow direction.



4. Installing the Slider

(11) Turn the lever fully in the arrow direction.
(12) Move the slider in the arrow direction, and lock it on the lever.

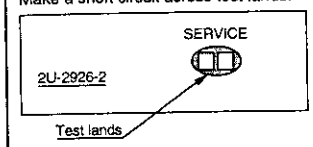


SERVICE MODE

Service Mode

Setting Service mode

Make a short circuit across test lands.



Connect the power plug to the AC outlet.

Note:
- If you want to cancel the service mode, disconnect the AC power plug with the state installing a disk, and disconnect the short circuit across the test lands. Also connect a 10ohm resistor 10W across C655 to check the voltage less than +1.0V at the + side of the C655, then disconnect the 10ohm resistor.
- Connect the AC power plug again to the AC outlet. In this time, check for the disk is ejected automatically. (If the disk is not ejected, repeat the process above.)
- In the end, turn the power switch on to check for the unit operates properly.

- Temperature compensation offset adjustment TEMP ADJUST — Don't perform this adjustment in normal state.
- Laser power adjustment LDPWR ADJUST Page 16
- Traverse adjustment EFBAL ADJUST Page 18
- Focus bias adjustment FBIAS ADJUST Page 19
- Focus bias adjustment check FBIAS CHECK Page 21
- Nonvolatile memory mode EEP MODE — This mode is not used in service. If you have this mode while servicing, cancel this mode immediately by pressing the TITLE key.

The mode switches every time by pressing the automatic search key.

Key Functions

Key name	Function
Automatic Search key	Settlement of Parameter, Mode.
TIME	Proceed forward. Settled.
TITLE	Back to previous. Cancelled.
PLAY	Continuous Play when pressing it in STOP status, and Tracking Servo ON/OFF when pressing it while continued playing.
STOP	Stop of Continuous Playing / Continuous Recording.
Manual Forward Search key	The slider moves to the outer periphery direction while pressing.
Manual Reverse Search key	The slider moves to the inner periphery direction while pressing.
REC	Recording ON/OFF by pressing it while continuous playing.
POWER	Switching between Pit and Group modes by each pressing.
PAUSE	Switching for Spindle Servo mode (CLVS/CLVA).
INPUT SELECT	Switching the contents of displaying. The display is changed by each sliding of the switch.
EJECT (Remote Control)	Ejecting a disk.

Note:
- The eject key of the remote control is used for ejecting a disk.
  Press the eject key after stopping or closing each mode since if the eject key is pressed while adjusting or checking, the disk will be ejected independent of operating status.
- In service mode, the function of the erase protection knob is not detected. If you press REC key, in Traverse mode or Continuous recording mode, your recorded disk may be erased. Pay attention to your disk used for it.

Notice of adjustment
When replacing the following parts, adjust and check the items marked with ○.

Adjustment	Optical Pick-up	Mechanism P.W. Board		
		IC171	D101	IC101, 121, 191
1. Temperature compensation offset adjustment	×	○	○	○
2. Laser power adjustment	○	×	×	○
3. Traverse check	○	○	×	○
4. Focus bias adjustment	○	○	×	○
5. Error rate check	○	○	×	○

- Don't turn the semi-fixed resistor RV105 on the Mechanism P.W. Board. When it is replaced with new one, adjust it to the mechanical center position.

Creating the MO disk of continuous recording

- This disk is used for the focus adjustment bias and the error rate check. The following describes how to create the MO disk of continuous recording.

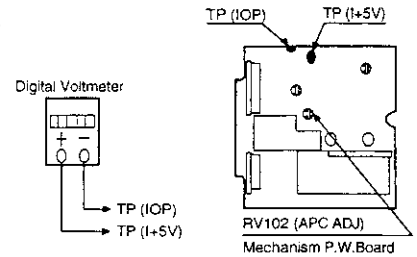
1. Load a MO disk (blank disk) sold in the market.
2. Press Automatic Search key to display [CREC MODE].
3. Press TIME key to display [CREC IN].
4. Press TIME key again to display [CREC MID].
   Recording will be started. Recording term should be within 5 minutes.
5. Press TITLE key to stop recording.
6. Press EJECT key to eject the MO disk.

Note:
- Do not apply any vibration while perforing continuous recording.

Laser Power adjustment
LDPWR ADJUST

Note:
- Don't look the emit lighting of the laser diode from just above to prevent you from the loss of eyesight.
- Pay special attention to handle the laser diode of the optical pick-up, since it is easy to have an electrostatic break.

Connection Diagram
- Connect the digital voltmeter to TP(IOP) and TP(I+5V).



Adjustment Method

1. Set the laser power meter on the object lens of the optical pick-up.
   (The optical pick-up is moved by pressing the manual search key.)
2. Press Automatic Search key to display [LDPWR ADJUST].
3. Press TIME key twice to display [LD$4B+3.5mW].
4. Adjust the RV102 (APC ADJ) of the Mechanism P.W.Board so that the reading of the laser power meter becomes 3.4 to 3.5mW.
5. Press TIME key to display [LD$96=7mW]. : Writing laser power adjustment
6. Check that the readings of the laser power meter and the digital voltmeter are within specified values below.

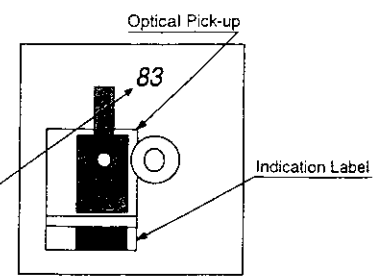
Specification

Reading of the laser power meter: 7.0 ±0.3mW
Reading of the digital voltmeter: ±10% of indicated value on the Optical Pick-up.

(Indication of the optical pick-up)

KMS210A
XXXXX
B 0 8 2 5

The value with handwriting is Iop value.
The value indicated on the label is rounded off. In case of 82.5mA, the value 83 is shown.



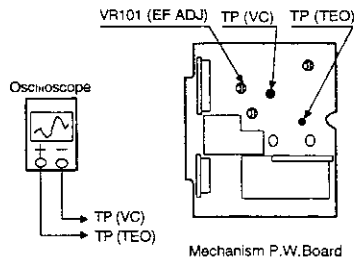
In this example, Iop=82.5mA
Iop(mA)=The reading(mV) of digital voltmeter ÷1 (ohm)

7. Press TIME key to display [LD$0F=0.7mW].
   Check that the reading of the laser power meter is 0.70 ±0.1mW.
8. Press TITLE key to display [LDPW ADJUST], and stop the laser emit lighting.
   (TITLE key is accepted any time to press, and the laser emit lighting can be stopped.)

Note:
- Laser power adjustment and check should be performed at the ambient temperature 22°C ±2°C and humidity 50% ±5%. (If the ambient condition differs, the deviation values should be corrected.)

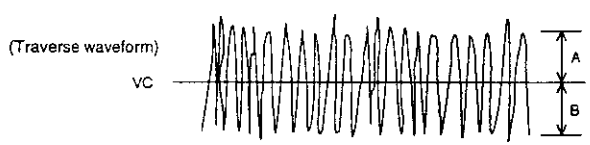
Traverse Adjustment
EFBAL ADJUST

Connection Diagram
- Connect the oscilloscope to TP(TEO) and TO(VC)



Adjustment Method

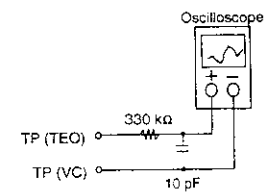
1. Load a MO disk sold in the at a market.
2. Press the manual search key to move the optical pick-up from the pit portion to outer periphery.
3. Press the automatic search key to display [EFBAL ADJUST].
4. Press TIME key to display [EFBAL MO-W].
5. Adjust the RV101 on the Mechanism P.W.Board so that the waveform on the oscilloscope becomes A=B.



6. Press TIME key. (MO groove read power traverse adjustment)
7. Press the automatic search key so that the waveform on the oscilloscope becomes A=B.
   (The waveform is changed when pressing the automatic search key. The waveform is changed in approximate 3% steps by this adjustment, and it should be adjusted closest to A=B.)
8. Press TIME key to save the adjustment result into the nonvolatile memory. In that time, [EFB=$_SAVE] is displayed in a moment, then the display will be changed to [EFBAL MO-P].
9. Press TIME key to display [EFB=$_ MO-P].
   The optical pick-up moves to the pit portion area automatically, and it is controlled by the servo.
10. Press the automatic search key so that the waveform on the oscilloscope becomes A=B.
    (The waveform is changed when pressing the automatic search key. The waveform is changed in approximate 3% steps by this adjustment, and it should be adjusted closest to A=B.)
11. Press TIME key to save the adjustment result into the nonvolatile memory. In that time, [EFB=$_SAVE] is displayed in a moment and the display will be changed to [EFBAL CD], then the rotation of the disk automatically stops.
12. Press EJECT key to eject the MO disk.

13. Load the test disk TDYS-1.
14. Press TIME key to be controlled by the servo.
15. Press the automatic search key so that the waveform on the oscilloscope becomes A=B.
    (The waveform is changed when pressing the automatic search key. The waveform is changed in approximate 3% steps by this adjustment, and it should adjusted closest to A=B.)
16. Press TIME key to save the adjustment result into the nonvolatile memory. At that time, [EFB=$_SAVE] is displayed in a moment and the display will be changed to [EFBAL ADJUST].
17. Press EJECT key to eject the test disk TDYS-1.

Note:
- If the recorded disk is used for this adjustment, the data is erased when writing into the MO disk.
- If the traverse waveform is difficult to see, it becomes better by connecting the filter as shown below.



Focus Bias Adjustment
FBIAS ADJUST

Adjustment Method

1. Load the continuous recorded disk (Refer to "Creating the MO disk of continuous recording").
2. Press the automatic search key to display [CPLAY MODE].
3. Press TIME key twice to display [CPLAY MID].
4. Press TITLE key after displaying [C1=_____AD=____].
5. Press the automatic search key to display [FBIAS ADJUST].
6. Press TIME key to display [_____/ ___a=___].
   The first 4 digit numerals show C1 error rate, the numerals after [/] show ADER, and the numerals after [a=] show the amount of focus bias.
7. Press the automatic search forward key to find the amount of focus bias which has 220 of C1 error rate.
   (When pressing the automatic search key of the main unit, don't press it continuously. If it is done, the adjustment can not be performed since the function is switched to the manual operation. If it is necessary to press the automatic search key continuously, press the automatic search key of the remote control.
8. Press TIME key to display [_____/ ___b=___].

9. Press the automatic search reverse key to find the amount of focus bias which has 220 of C1 error rate.

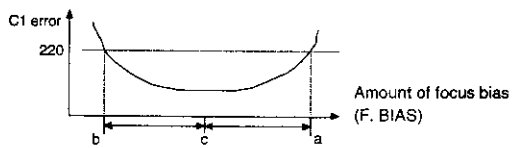
10. Press TIME key to display [____/ __c=___].

11. At that time, check that the C1 error rate is less than 50 and ADER is 00, then press TIME key.

12. If the value of display [(____)] in the [____-____- (____)] shows more than 20, press TIME key. If it is less than 20, press TITLE key and perform the adjustment again from the step 2 above.

13. Press TITLE key and press EJECT key to eject the continuous recorded disk.

Note:
- The relation between C1 error and the amount of focus bias is shown in the figure below. Find the point a and b in the figure below after adjusting the process described above. The best focus point c can be obtained by calculating automatically from the points a, b.
- Adjust the C1 error rate by reading the average value since it has fluctuation.



Checking error rate

Checking CD error rate

Check Method

1. Load the test disk TDYS-1.

2. Press the automatic search key to display [CPLAY MODE].

3. Press TIME key twice to display [CPLAY MID]. [C1=_____ AD= – –] is displayed.

4. Check that the C1 error rate is less than 20.

5. Press TITLE key to stop playing-back, and press EJECT key to eject the test disk.

Checking MO error rate

Check Method

1. Load a continuous recorded disk.

2. Press the automatic search key to display [CPLAY MODE].

3. Press TIME key twice to display [CPLAY MID]. [C1=_____ AD=___] is displayed.
C1=_____ shows C1 error, AD=___ shows ADER.

4. Check that the C1 error rate is less than 50, and ADER is 00.

5. Press TITLE key to stop playing-back, and press EJECT to eject the continuous recorded disk.

Focus Bias Check
FBIAS CHECK

Check Method

1. Load the continuous recorded disk.

2. Press the automatic search key to display [CPLAY MODE].

3. Press TIME key twice to display [CPLAY MID].
Press TITLE key after displaying [C1=_____AD=____].

4. Press the automatic search key to display [FBIAS CHSCK].

5. Press TIME key to display [_____/ ___c=___].
The first 4 digit numerals show C1 error rate, the numerals after [/] show ADER, and the numerals after [c=] show the amount of focus bias.
At this time, check that the C1 error rate is less than 50 and ADER is 00.

6. Press TIME key, changes the display to [_____/ ___b=___].
At this time, check that the C1 error rate is less than 220 and ADER is always 00.

7. Press TIME key, changes the display to [_____/ ___a=___].
At this time, check that the C1 error rate is less than 220 and ADER is always 00.

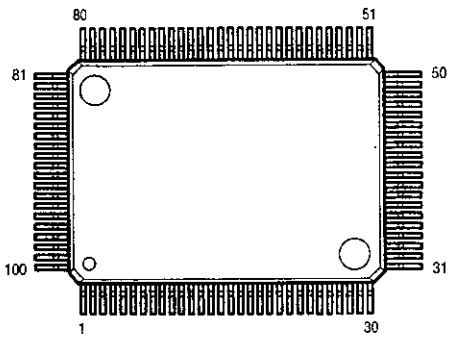
8. Press TITLE key, and press EJECT key to eject the continuous recorded disk.

Note:
- In case C1 error or ADER rate exceeds 00 at the points a or b, focus bias adjustment may deviated. Perform readjustment.

SEMICONDUCTORS

● IC's

M37610MD (IC800)



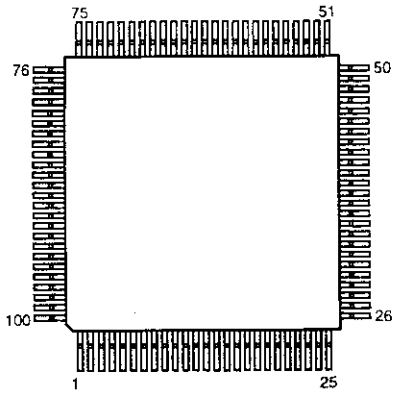
M37610MD Terminal Function

Pin No.	Symbol	I/O	Function
1	EMPHASIS	O	Emphasis ON at "H".
2		I	Fixed on "L".
3		I	Fixed on "L".
4		I	Fixed on "H".
5		I	Fixed on "H".
6		I	Fixed on "H".
7		I	Fixed on "L".
8	XINT	I	Interrupt status input from CXD2536R.
9	SENS	I	Inner status (SENSE) input from CXD2535R.
10	SHCK	I	Track jump signal input from CXD2535R.
11		I	Fixed on "L".
12		O	Open.
13		I	Fixed on "L".
14	REC/OTHER	O	Recording : "L", Other : "H".
15		O	Open.
16		I	Fixed on "L".
17	CNVss	—	Ground.
18	SYSTEM RST	I	System reset signal input Inputs "L" for a few hundred msec after the power rising up, and then make "H".
19			Fixed on "L".
20			Fixed on "L".
21	Vss	—	Ground.
22	XIN	I	Clock input (8MHz).
23	XOUT	O	Clock output (8MHz).
24	Vcc	—	Power input +5V.
25	STB	O	Strobe signal output for power supply circuit Power ON: "H", Stand-by: "L".
26		I	Fixed on "L".
27		I	Fixed on "L".
28		O	Open.
29		I	Fixed on "L".
30		I	Not used.
31		I	Not used.
32	LED0	O	Power ON : "H", Stand-by : "L".
33		I	Fixed on "L".
34		I	Fixed on "L".
35		I	Fixed on "L".
36		I	Fixed on "L".
37		I	Fixed on "L".
38		I	Fixed on "L".
39	SDA	I/O	Data signal input/output with backup memory.
40	SCL	O	Clock signal output to backup memory.

Pin No.	Symbol	I/O	Function
41	POWER DOWN	I	Power down detection input Normal: "H".
42		I	Fixed on "H".
43	ATSY	I	Connected to SQSY of CXD2535R, Input of ATIP SYNC or SUBQ SYNC.
44	DQSY	I	SUBQ SYNC input for U-bit CD format of digitalin-in from CXD2535R.
45		I	Fixed on "L".
46		I	Fixed on "L".
47		I	Fixed on "L".
48		I	Fixed on "L".
49	SCLK	I/O	Clock signal output to serial bus.
50	SWDT	I/O	Writing data signal output to serial bus.
51	SRDT	I	Reading data signal input from serial bus.
52		I	Connected to pin 51.
53		O	Open.
54		O	Open.
55		O	Open.
56		I	Fixed on "L".
57		I	Fixed on "L".
58	TEST1	O	Reset signal output to CXD2536R.
59		I	Fixed on "L".
60		I	Fixed on "L".
61		I	Fixed on "L".
62		I	Fixed on "L".
63	LDON	O	Laser ON/OFF control output ON at "H".
64		I	Fixed on "L".
65	FOK	I	FOK signal input from CXD2535R.
66		I	Pull-down.
67	LOCK	I/O	Spindle servo lock monitor output Lock at "H".
68	WRPWR	I/O	Laser power switching signal output to optical block and CXD2535R.
69	DIG RST	I/O	Reset signal output to CXA1981R, CXD2535R and motor driver.
70	DA RST	I/O	Reset signal output to D/A converter or A/D converter.
71	SCMD1	I/O	Not used.
72	SCMD0	I/O	Serial command control mode output to CXD2536R with SCMD1.
73	MOD	I/O	Laser modulation switching signal output. Record, Playback : "L", Stop: "H".
74	REC/PB	I/O	Record/Playback switching signal output to CXD2535R. Record : "H", Playback : "L".
75	WR/WN	I/O	Write/Monitor mode switching signal output to CXD2535R.
76	SCTX	I/O	Write data transmit timing output to CXD2536R and ON/OFF output to magnetic head.
77	XLATCH	I/O	Latch signal output to serial bus.
78	DFLATCH	I/O	Latch signal output to D/A converter.
79		I/O	Pull-down.
80	AMUTE	I/O	Line out mute output. Mute at "L".
81	LDOUT	O	Loading motor control output.
82	LDIN	O	Loading motor control output.
83	CHKIN	I	Chucking switch detection input Chucking : "L".
84	INSW	I	Detection input from loading-in switch, Magnetic head descended position : "L".
85	OUTSW	I	Detection input from loading-out switch Load out position : "L".
86	PROTECT	I	Recording protection flap detection input from protect detection switch. Protection: "H".
87	REFLECT	I	Disk reflection rate detection input from reflect detection switch. Low reflection rate disk: "H".
88	LIMIT IN	I	Detection input from limit-in switch. Sled limit in : "L".
89	CTS	I	RS232C terminal.
90	RTS	O	RS232C terminal.
91	TXD	O	RS232C terminal.
92	RXD	I	RS232C terminal.
93		I	Fixed on "L".
94		I	Fixed on "L".
95		I	Fixed on "L".
96		I	Fixed on "L".
97	AVss	—	Ground.
98	VREF	—	Reference voltage input +5V.
99		I	Fixed on "L".
100		I	Fixed on "L".

Note: I/O terminals are specified as input terminals at POWER OFF (STANDBY) status except pin No. 39 of SDA.

HD6433836 (IC308)
Microcomputer

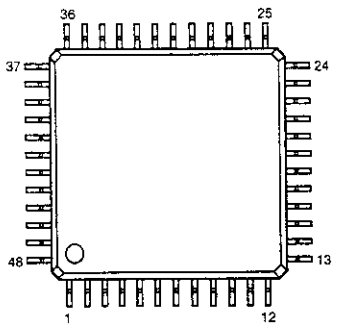


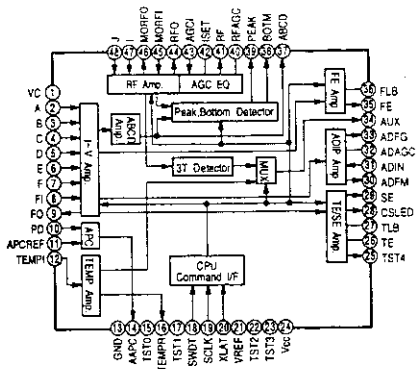
HD6433836 Terminal Function

Pin No.	Symbol	Port Name	I/O	Ini	Ext	Function
1	Pc3/AN11	TMPLY	I	—	P.UP	Timer PLAY signal input.
2	AVss	AVss	I	—	—	Connect with GND (GND for A/D converter).
3	TEST	TEST	I	—	—	Connect with GND (Test terminal).
4	X2	X2	I	—	—	Open (Sub clock output).
5	X1	X1	O	—	—	Connect with +5V (Sub clock input terminal).
6	Vss	Vss	I	—	—	Connect with GND for system.
7	OSC1	OSC1	I	—	—	Ceramic oscillator input.
8	OSC2	OSC2	O	—	—	Ceramic oscillator output.
9	RES	RESET	I	—	—	Reset signal input (oscillation stable time: 40 msec).
10	MD0	MD0	I	—	—	Connect with +5V (Reset control).
11	P20/IRQ4/ADTRG	JOGA	I	—	P.UP	Pulse noninverting input terminal of jog A.
12	P21/UD	SRVICE	I	—	P.UP	Service mode judgment input ("H": normal mode, "L": service mode
13	P22	FLDA	O	L	—	Data output to FL tube controller.
14	P23	FLCK	O	L	—	Clock output to FL tube controller.
15	P24	FLCS	O	L	—	Chip selection output to FL tube controller.
16	P25		O	L	—	Open (Not used).
17	P26		O	L	—	Open (Not used).
18	P27	CE	O	L	—	Latch output for LC8903 microcomputer interface.
19	P30/SCK1	CL	O	L	—	Clock output for LC8903 microcomputer interface.
20	P31/SI1	DO	I	L	—	Data input for LC8903 microcomputer interface.
21	P32/SO1	DI	O	L	—	Address output for LC8903 microcomputer interface.
22	P33/SCK2	SHT	O	L	—	Open (Not used).
23	P34/SI2	SO	O	L	—	Open (Not used).
24	P35/SO2	SI	O	L	—	Open (Not used).
25	P36/STRB	C/D	O	L	—	Open (Not used).
26	P37/CS	CS	O	L	—	Open (Not used).
27	Vss	Vss	I	—	—	Connect with GND (GND for system).
28	V3		I	—	—	Open (power supply for LCD).
29	V2		I	—	—	Open (power supply for LCD).
30	V1		I	—	—	Open (power supply for LCD).
31	Vcc	Vcc	I	—	—	Connect with +5V (power supply for system).
32	PA3/COM4	EMPHA	I	—	(UP)	Emphasis signal input ("H": emphasis, "L": non-emphasis).
33	PA2/COM3	ERROR	I	—	P.DW	Error signal input "H": error (lock NG), "L": non-error (lock OK)).
34	PA1/COM2	SUB1	I	—	(UP)	fs input1 "L" ┐ 44.1 "L" ┐ 48 "H" ┐ 32(kHz) "H" ┐ unlock
35	PA0/COM1	SUB2	I	—	(UP)	fs input2 "L" ┘ "H" "H" "L" ┘
36	P50/WKP0/SEG1	COPY	O	H	(UP)	COPY bit setting terminal ("H": non-rights reserved, "L": rights reserved).
37	P51/WKP1/SEG2	CTG1	O	H	(UP)	Category setting terminal 1 "H" ┐ "L" ┐
38	P52/WKP2/SEG3	CTG2	O	H	(UP)	Category setting terminal 2 "H" ├ sample rate converter "L" ├ general
39	P53/WKP3/SEG4	CTG3	O	L	(UP)	Category setting terminal 3 "H" ┘ "L" ┘
40	P54/WKP4/SEG5	LBIT	O	H	(UP)	L bit setting terminal ("H": original, "L": high order).

Pin No.	Symbol	Port Name	I/O	Ini		Function
41	P55/WKP5/SEG6		O	L	—	Open (Not used).
42	P56/WKP6/SEG7		O	L	—	Open (Not used).
43	P57/WKP7/SEG8		O	L	—	Open (Not used).
44	P60/SEG9		O	L	—	Open (Not used).
45	P61/SEG10		O	L	—	Open (Not used).
46	P62/SEG11		O	L	—	Open (Not used).
47	P63/SEG12		O	L	—	Open (Not used).
48	P64/SEG13		O	L	—	Open (Not used).
49	P65/SEG14		O	L	—	Open (Not used).
50	P66/SEG15		O	L	—	Open (Not used).
51	P67/SEG16		O	L	—	Open (Not used).
52	P70/SEG17		O	L	—	Open (Not used).
53	P71/SEG18		O	L	—	Open (Not used).
54	P72/SEG19		O	L	—	Open (Not used).
55	P73/SEG20		O	L	—	Open (Not used).
56	P74/SEG21		O	L	—	Open (Not used).
57	P75/SEG22		O	L	—	Open (Not used).
58	P76/SEG23		O	L	—	Open (Not used).
59	P77/SEG24		O	L	—	Open (Not used).
60	P80/SEG25		O	L	—	Open (Not used).
61	P81/SEG26		O	L	—	Open (Not used).
62	P82/SEG27		O	L	—	Open (Not used).
63	P83/SEG28		O	L	—	Open (Not used).
64	P84/SEG29		O	L	—	Open (Not used).
65	P85/SEG30		O	L	—	Open (Not used).
66	P86/SEG31		O	L	—	Open (Not used).
67	P87/SEG32		O	L	—	Open (Not used).
68	P90/SEG33		O	L	—	Open (Not used).
69	P91/SEG34		O	L	—	Open (Not used).
70	P92/SEG35	ADRST	O	L	—	Open (Not used).
71	P93/SEG36	AMUTE	O	L	—	Open (Not used).
72	P94/SEG37/M	XRST	O	L	—	Open (Not used).
73	P95/SEG38/DO	RECLED	O	L	—	Open (Not used).
74	P96/SEG39/CL2	BKLIGHT	O	L	—	Open (Not used).
75	P97/SEG40/CL1	STB	I	L	P.UP	Strobe signal input.
76	Vcc	Vcc	I	—	—	Connect with +5V (power supply for system).
77	P10/TMOW	C/O.OUT	O	L	—	COAX/OPT switching signal output ("H": COAX, "L": OPT).
78	P11/TMOFL	D/A.OUT	O	L	—	Digital/Analog switching signal output ("H": Digital, "L": Analog).
79	P12/TMOFH	POWER	O	L	—	Open (Not used).
80	P13/TMIG		O	L	—	Open (Not used).
81	P14/PWM		O	L	—	Open (Not used).
82	P15/IRQ1/TMIB	REMOTE	I	—	P.UP	Remote control receiving interrupt terminal.
83	P16/IRQ2/TMIC	75E	O	—	—	Connect with GND "H": DMD-7.5E, L: DMD-1500.
84	P17/IRQ3/TMIF	JOGA	O	—	P.UP	Pulse input for jog A.
85	P40/SCK3	RTS	O	H	P.UP	Status receive control. "H": Inhibit receive, "L": Permit receive.
86	P41/RXD	RXD	I	H	P.UP	Status receive terminal.
87	P42/TXD	TXD	O	H	P.UP	Command transmit terminal.
88	P43/IRQ0	CTS	I	H	P.UP	Command transmit control terminal. "H": Inhibit transmit, "L": Permit transmit.
89	AVcc	AVcc	I	—	—	Connect with +5V (power supply for A/D converter).
90	PB0/AN0	KEY0	I	—	P.UP	Key matrix input 0 (A/D conversion use).
91	PB1/AN1	KEY1	I	—	P.UP	Key matrix input 1 (A/D conversion use).
92	PB2/AN2	KEY2	I	—	P.UP	Key matrix input 2 (A/D conversion use).
93	PB3/AN3	KEY3	I	—	—	Connect with GND.
94	PB4/AN4		I	—	—	Connect with GND.
95	PB5/AN5		I	—	—	Connect with GND.
96	PB6/AN6		I	—	—	Connect with GND.
97	PB7/AN7	JOGB	I	—	P.UP	Pulse input of jogB.
98	PC0/AN8	D/A.IN	I	—	P.UP	Switching input for DIG/ANA "H": digital, "L": analog.
99	PC1/AN9	C/O.IN	I	—	P.UP	Switching input for COAX/OPT "H": COAX, "L": OPT.
100	PC2/AN10	TMREC	I	—	P.UP	Input for timer REC.

CXA1981 (IC101)





CXA1981 Terminal Function

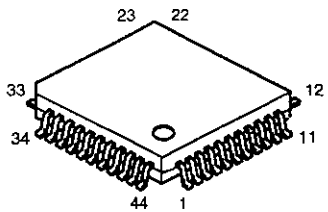
Pin No.	Symbol	I/O	Function
1	VC	O	Vcc/2 voltage output.
2	A	I	Current input of main beam-servo signal A.
3	B	I	Current input of main beam-servo signal B.
4	C	I	Current input of main beam-servo signal C.
5	D	I	Current input of main beam-servo signal D.
6	E	I	Current input of side beam-servo signal E.
7	F	I	Current input of side beam-servo signal F.
8	FI	I	EF balance adjustment.
9	FO	O	EF balance adjustment.
10	PD	I	Radiation quantity monitor signal input.
11	APCREF	I	Laser power setting reference voltage input.
12	TEMPI	I	Temperature sensor connection terminal.
13	GND	—	Ground.
14	AAPC	O	Analog APC output.
15	TSTO	O	Test terminal used at open status.
16	TEMPR	O	Reference voltage output for temperature sensor.
17	TST1	I	Test terminal Connect to Vcc.
18	SWDT	I	Data input for microcomputer serial interface.
19	SCLK	I	Shift lock input for microcomputer serial interface.
20	XLAT	I	Latch input for microcomputer serial interface. Latch at "L".
21	VREF	O	Reference voltage output.
22	TST2	O	Test terminal Used at open status.
23	TST3	—	Test terminal Used at open status.
24	Vcc	—	Power supply.
25	TST4	I	Test terminal Connect to VC.
26	TE	O	Tracking error signal output.
27	TLB	—	Low boost capacitor connection terminal for tracking error signal.
28	CSLED	—	Thread error signal LPF capacitor connection terminal.
29	SE	O	Thread error signal output.
30	ADFM	O	FM signal output of ADIP.
31	ADIN	I	ADIP signal comparator input.
32	ADAGC	—	ADIP AGC capacitor connection terminal.
33	ADFG	O	ADIP binarization output.
34	AUX	O	I3 output/temperature signal output.
35	FE	O	Focus error signal output.
36	FLB	—	Capacitor connection terminal for focus error signal low boost.
37	ABCD	O	Radiation quantity signal output of main beam-servo detector.
38	BOTM	O	Bottom signal output of RF/ABCD.
39	PEAK	O	Peak signal output of RF/ABCD.
40	RFAGC	—	RF AGC capacitor connection terminal.
41	RF	O	RF equalizer output.
42	ISET	—	BPF (fo=720kHz, 22kHz) and RF equalizer setting.
43	AGCI	I	RF AGC input.
44	RFO	O	RF amp output Check point of eye patterns.
45	MORFI	I	Terminal for inputting groove RF signal with AC couple.
46	MORFO	O	Groove RF signal output.
47	I	I	Input of I-V converted RF signal I.
48	J	I	Input of I-V converted RP signal J.

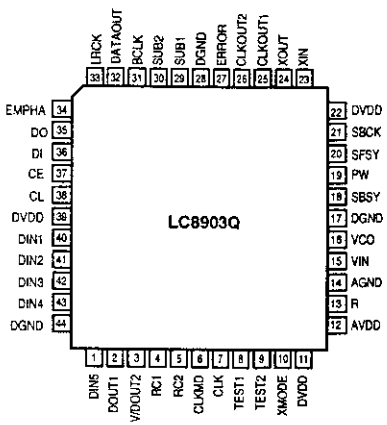
LC8903Q Terminal Function

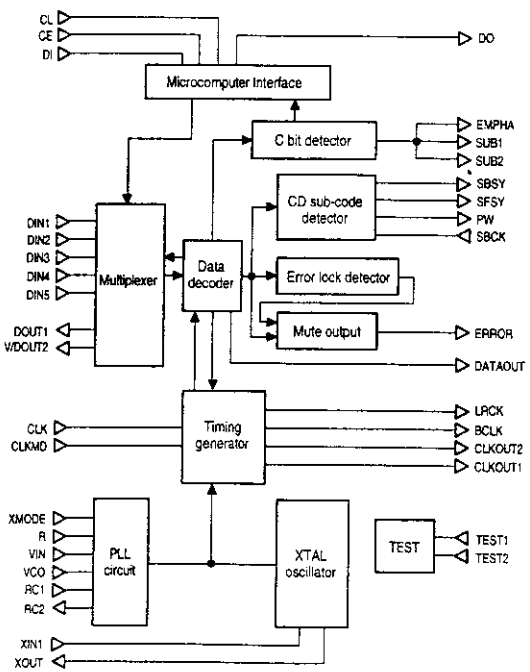
Pin No.	Symbol	I/O	Function
1	DIN5	I	Non built-in amp data input.
2	DOUT1	O	EIAJ data data through output.
3	V/DOUT2	O	Parity flag output. EIAJ data through output by microcomputer interface.
4	RC1	I	Input for RC oscillator. Detecting error lock of PLL and generating clock for resetting PLL system.
5	RC2	O	Output for RC oscillator. Output of approx. 40kHz clock using time constant of sample circuit.
6	CLKMD	I	Output clock switch for CLKOUT2 : 256fs=[L], 128fs=[H].
7	CLK	I	Clock mode switch : 512fs=[H], 384fs=[L].
8	TEST1	I	Test terminal (Normally [L]).
9	TEST2	I	
10	XMODE	I	Start system operation after power ON.
11	DVDD	—	Power supply for digital circuit.
12	AVDD	—	Power supply for analog circuit.
13	R	I	VCO oscillating range adjustment.
14	AGND	—	Analog ground.
15	VIN	I	VCO free run oscillation setting.
16	VCO	O	LPF for PLL.
17	DGND	—	Digital ground.
18	SBSY	O	Sub-code interface block sync signal.
19	PW	O	Sub-code interface data output.
20	SFSY	O	Sub-code interface frame sync signal.
21	SBCK	I	Sub-code interface bit clock input.
22	DVDD	—	Power supply for digital circuit.
23	XIN	I	X-tal oscillator input.
24	XOUT	O	X-tal oscillator output.
25	CLK OUT1	O	Clock output for VCO, X-tal oscillator.
26	CLK OUT2	O	256fs, 128fs clock output.
27	ERROR	O	Error mute signal output.
28	DGND	—	Digital ground.
29	SUB1	O	Sampling frequency output.
30	SUB2	O	
31	BCLK	O	Bit clock output.
32	DATA OUT	O	Audio data output.
33	LRCK	O	L, R clock output.
34	EMPHA	O	Emphasis = [H], No emphasis = [L]; Analog mode = [L].
35	DO	O	Microcomputer interface output.
36	DI	I	Microcomputer interface input.
37	CE	I	Microcomputer interface chip enable input.
38	CL	I	Microcomputer interface clock input.
39	DVDD	—	Power supply for digital circuit.
40	DIN1	I	Built-in amp data input.
41	DIN2	I	
42	DIN3	I	
43	DIN4	I	
44	DGND	—	Digital ground.

Sampling frequency	32 kHz	44.1 kHz	48 kHz	ERR
SUB1	H	L	L	H
SUB2	H	H	H	L

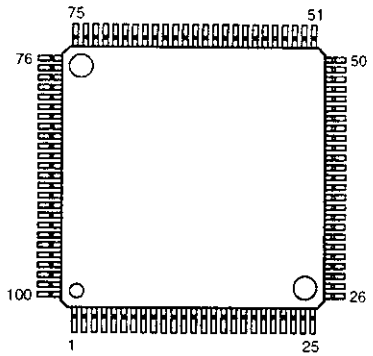
LC8903Q (IC413)

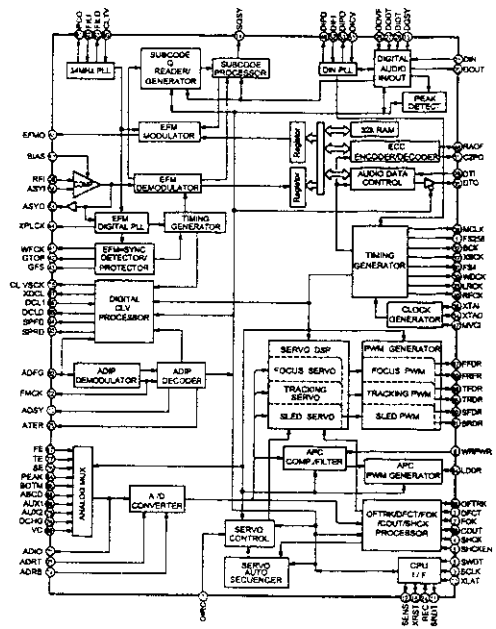






CXD2535BR (IC121)





CXD2535BR Terminal Function

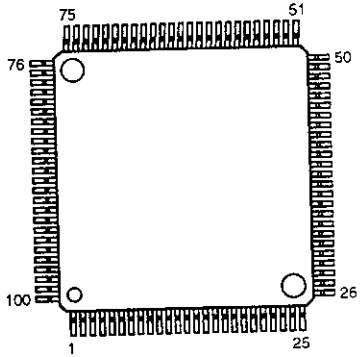
Pin No.	Symbol	I/O		Function
1	FS256	O	H,L	256Fs output (11.2896MHz).
2	FOK	O	H,L	Focus OK signal output. "H" = Focus OK
3	DFCT	O	H,L	Defect detection output. "H" = Track jump
4	SHCK	O	H,L	Track jump detection output. "H" = Track jump
5	SHCKEN	I		Track jump detection enable output. "H" = enable
6	WRPWR	I		Laser power switching input. "H" = Record power, "L" = Playback power
7	DIRC	I		Track jump control signal.
8	SWDT	I		Microcomputer serial interface data input.
9	SCLK	I		Microcomputer serial interface shift clock input.
10	XLAT	I		Microcomputer serial interface latch input. Latching at power fall.
11	SRDT	O	H,Z,L	Microcomputer serial interface data output.
12	SENS	O	H,Z,L	Internal status output in response to adress of microcomputer serial interface.
13	ADSY	O	H,L	ADIP sync output.
14	SQSY	O	H,L	Disc sub-code Q sync / ADIP sync output.
15	DQSY	O	H,L	Sub-code Q sync output for Ubit CD or MD format at digital source is CD or MD.
16	XRST	I		Reset input. "L" = Reset
17	TEST4	I		Test terminal. Connect to GND.
18	CLVSCK	O	H,L	Clock output for spindle servo evaluation (5.6448MHz).
19	TEST5	I		Test terminal. Connect to GND.
20	DOUT	O	H,L	Digital audio interface signal output.

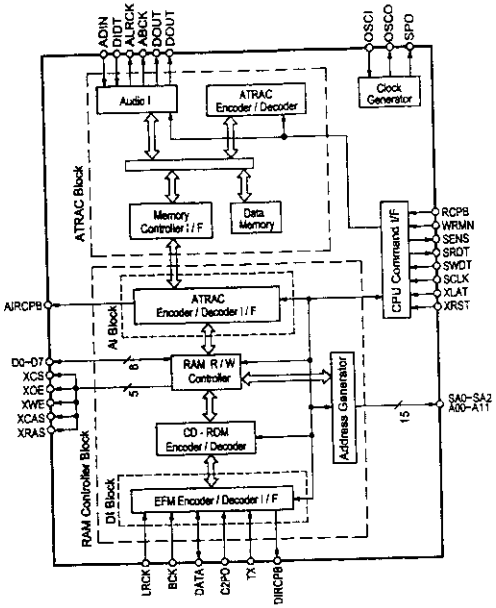
Pin No.	Symbol	I/O		Function
21	DIN	I		Digital audio interface signal output.
22	FMCK	O	H,L	FM decoder clock output for ADIP.
23	ATER	O	H,L	ADIP CRC flag output. "H" = Error
24	REC	I		Record/Playback switch. "H" = Record, "L" = Playback.
25	DVss			Digital GND.
26	DOVF	I		Input for Vbit of output signal from DOUT.
27	DODT	I		Audio data input of output signal from DOUT and peak level detection.
28	DIDT	O	H,L	Audio data output of input signal from DIN.
29	DTI	I		Record data input from CXD2536.
30	DTO	O	H,Z,L	Playback data output to CXD2536 at playback. "Z" = Record
31	C2PO	O	H,L	C2 pointer output of playback data at playback. Vbit output of digital in at digital Rec. "L" at analog Rec.
32	BCK	O	H,L	64Fs output (2.8224MHz).
33	LRCK	O	H,L	Fs output (44.1kHz).
34	XTAO	O		X-tal oscillator circuit output (Reverse output of XTAL terminal).
35	XTAI	I		X-tal oscillator circuit input (512Fs=22.5792MHz).
36	MCLK	O	H,L	Master lock output (512Fs=22.5792MHz).
37	XBCK	O	H,L	BCK reverse output.
38	DVDD			Power supply for digital circuit.
39	WDCK	O	H,L	2Fs output (88.2kHz).
40	RFCK	O	H,L	Read Frame Clock output (Fs/6).
41	WFCK	O	H,L	Write Frame Clock output.
42	GTOP	O	H,L	Operating status monitor of frame sync protection window. Releasing frame sync protection window at "H".
43	GFS	O	H,L	Frame sync OK at "H".
44	XPLCK	O	H,L	PLL clock output of EFM recorder (98Fs=4.3218MHz).
45	EFMO	O	H,L	"L" at playback. EFM (Encode data) output at record.
46	RAOF	O	H,L	RAM-over flow output at playback.
47	MVCI	I		External VCO Clock input for digital in PLL.
48	TEST2	I		Test terminal. Connect to GND.
49	DIPD	O	H,Z,L	Digital in PLL phase comparator output.
50	DVss			Digital GND.
51	DICV	I	analog	Internal VCO control voltage input for digital in PLL.
52	DIFI	I	analog	Filter input when using VCO for digital in PLL.
53	DIFO	O	analog	Filter output when using VCO for digital in PLL.
54	AVDD			Power supply for analog circuit.
55	ASYO	O	H,L	Playback EFM full swing output ("L"=Vss, "H"=VDD).
56	ASYI	I	analog	Playback EFM comparator slice voltage input.
57	BIAS	I	analog	Playback comparator slice current input.
58	RFI	I	analog	Playback EFM RF signal input.
59	AVss			Analog GND.
60	CLTV	I	analog	Internal VCO control voltage input for master PLL of playback digital PLL and recording EFM PLL.
61	PCO	O	H,Z,L	Phase comparator output for master PLL of playback digital PLL and recording EFM PLL.
62	FILI	I	analog	Filter input for master PLL of playback digital PLL and recording EFM PLL.
63	FILO	O	analog	Filter output for master PLL of playback digital PLL and recording EFM PLL.
64	PEAK	I	analog	Peak hold signal input for radiation quantity.
65	BOTM	I	analog	Bottom hold signal input for radiation quantity.
66	ABCD	I	analog	Radiation quantity signal input.
67	FE	I	analog	Focus error signal input.
68	AUX1	I	analog	Auxiliary input 1.
69	VC	I	analog	Center voltage input.
70	ADIO	O	analog	Monitor output of A/D converter input signal.
71	TEST3			Test terminal. Connect to GND.
72	AVDD			Power supply for analog circuit.
73	ADRT	I	analog	A/D converter operating range upper limit voltage input.
74	ADRB	I	analog	A/D converter operating range lower limit voltage input.

Pin No.	Symbol	I/O		Function
75	ABss			Analog GND.
76	SE	I	analog	Sled error signal input.
77	TE	I	analog	Tracking error signal input.
78	AUX2	I	analog	Auxiliary input 2.
79	DCHG	I		Connect to GND.
80	TEST6	I		Test terminal. Connect to GND.
81	TEST1	I		Test terminal. Connect to GND.
82	ADFG	I		ADIP binarization FM signal (22.05 ±1kHz) input.
83	TS25	I		Test terminal. Connect to GND.
84	LDDR	O	H,L	Laser APC drive output.
85	TRDR	O	H,L	Tracking servo drive output. (–)
86	TFDR	O	H,L	Tracking servo drive output. (+)
87	FFDR	O	H,L	Focus servo drive output. (+)
88	DVDD			Digital GND.
89	FRDR	O	H,L	Focus servo drive output. (–)
90	FS4	O	H,L	4Fs output (176.4kHz).
91	SRDR	O	H,L	Sled servo drive output. (–)
92	SFDR	O	H,L	Sled servo drive output. (+)
93	SPDR	O	H,L	Spindle servo drive output. (–)
94	SPFD	O	H,L	Spindle servo drive output. (+)
95	DCLO	O	H,L	Spindle servo evaluation serial data output.
96	DCLI	O		Spindle servo evaluation serial data input.
97	XDCL	I	H,L	Spindle servo evaluation serial data load signal output.
98	OFTRK	O	H,L	Off track signal output. Off track at "H".
99	COUT	O	H,L	Track jump count signal output.
100	VDss	O		Digital GND.

* DIRC terminal : This terminal is used when performing track jump without using auto sequencer. When auto sequencer is not used, set this terminal to "H".
* The terminals between XTALI and XTAO have built-in feed back resistor.
* GFS terminal : When frame sync and installed protection timing coincide, this terminal becomes "H".
* RAOF terminal : In playback, if the internal 32kRAM exceeds the jitter margin of ±4 frame, this terminal becomes "H".
* MVCI terminal : When using the internal VCO for digital in PLL, connect this terminal to GND.
* DICV terminal : When using the external VCO for digital in PLL, connect this terminal to "H".
* DCHG terminal : Connect this terminal to the low impedance GND.
* AUX1, AUX2 terminals : If not used, connect them to GND.

CXD2536AR (IC801)



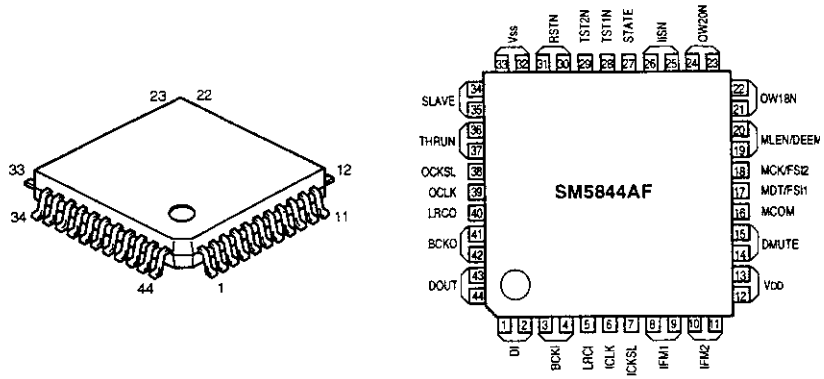


CXD2536AR Terminal Function

Pin No.	Symbol	I/O		Function
1	VDD			Power supply.
2	SWDT	I		Data input for microcomputer serial interface.
3	SCLK	I		Shift clock input for microcomputer serial interface.
4	XLAT	I		Latch input for microcomputer serial interface. Latched at falling.
5	SRDT	O	H,Z,L	Data output for microcomputer serial interface.
6	SENS	O	H,Z,L	Internal status output in response to address of microcomputer serial interface.
7	SMD0	I		Control mode of serial command.
8	SMD1	I		Control mode of serial command.
9	XINT	O	H,L	Interrupt request output. "L" at generating of interrupt status.
10	RCPB	I		"L" Playback mode / "H" Record mode.
11	WRMN	I		"H" Write mode / "L" Monitor mode.
12	TX	I		Enable signal input of recording data output. Enable at "H".
13	Vss			Connect to GND.
14	TST0	I		Test terminal. Connect to GND.
15	TST1	I		Test terminal. Connect to GND.
16	TST2	I		Test terminal. Connect to GND.
17	XRST	I		Reset input. Reset at "L".
18	TS0	I		Test terminal. Connect to GND.
19	TS1	I		Test terminal. Connect to GND.
20	TS2	I		Test terminal. Connect to GND.
21	TS3	I		Test terminal. Connect to GND.
22	TST3	I		Test terminal. Connect to GND.
23	TST4	I		Test terminal. Connect to GND.
24	TST5	I		Test terminal. Connect to GND.
25	Vss			Connect to GND.
26	AIRCPB	O	H,L	Record/Playback mode output of ATRC block. Record mode at "H". Playback mode at "L"
27	TST6	O		Test terminal. Used at open.
28	TST7	O		Test terminal. Used at open.
29	TST8	O		Test terminal. Used at open.
30	TST9	O		Test terminal. Used at open.

Pin No.	Symbol	I/O		Function
31	TST10	O		Test terminal. Used at open.
32	TST11	O		Test terminal. Used at open.
33	TST12	O		Test terminal. Used at open.
34	TST13	O		Test terminal. Used at open.
35	TST14	O		Test terminal. Used at open.
36	OSCO	O		X-tal oscillator circuit output (1024Fs).
37	OSCI	I		X-tal oscillator circuit input (1024Fs).
38	Vss			Connect to GND.
39	TST15	O		Test terminal. Used at open.
40	TST16	O		Test terminal. Used at open.
41	DOUT	O	H,L	REC monitor output / Decode audio data output.
42	ADIN	I		Analog record input. (Connect external A/D converter output.)
43	ABCK	O	H,L	XBCK (64Fs) output to external audio block.
44	ALRCK	O	H,L	LRCK (Fs) output to external audio block.
45	SA2	O	H,L	SRAM address bus.
46	SA1	O	H,L	SRAM address bus.
47	SA0	O	H,L	SRAM address bus.
48	A11	O	H,L	RAM address bus.
49	A10	O	H,L	RAM address bus.
50	Vss			Connect to GND.
51	VDD			Power supply.
52	A03	O	H,L	RAM address bus.
53	A02	O	H,L	RAM address bus.
54	A01	O	H,L	RAM address bus.
55	A00	O	H,L	RAM address bus.
56	A04	O	H,L	RAM address bus.
57	A05	O	H,L	RAM address bus.
58	A06	O	H,L	RAM address bus.
59	A07	O	H,L	RAM address bus.
60	A08	O	H,L	RAM address bus.
61	XOE	O	H,L	RAM output enable.
62	XCAS	O	H,L	DRAM $\overline{CAS}$ output.
63	Vss			Connect to GND.
64	XCS	O	H,L	RAM chip select. DRAM at "H", SRAM at "L".
65	A09	O	H,L	RAM address bus.
66	XRAS	O	H,L	DRAM $\overline{RAS}$ output.
67	XWE	O	H,L	RAM write enable.
68	D1	I/O	H,L	RAM data bus.
69	D0	I/O	H,L	RAM data bus.
70	D2	I/O	H,L	RAM data bus.
71	D3	I/O	H,L	RAM data bus.
72	D4	I/O	H,L	RAM data bus.
73	D5	I/O	H,L	RAM data bus.
74	D6	I/O	H,L	RAM data bus.
75	Vss			Connect to GND.
76	D7	I/O	H,L	RAM data bus.
77	ERR	I/O	H,L	Data input/output to exclusive RAM of C2PO.
78	EXTC2R	I		Exclusive RAM selection of C2PO. "H": to use, "L": not to use.
79	BUSY	O	H,L	RAM access busy output. RAM access: "H".
80	EMP	O	H,L	Signal output to show empty or just before full of ATRAC data.
81	FUL	O	H,L	Signal output to show full or just before empty of ATRAC data.
82	EQL	O	H,L	Empty of ATRAC data. (ASC=DSC at "H").
83	MDLK	O	H,L	Main/Sub of record/playback data are shown. Sub or linking at "H", Main at "L".
84	CPSY	O	H,L	Installed sync output.
85	CTMD0	O	H,L	Internal counter mode output.
86	CTMD1	O	H,L	Internal counter mode output.
87	SQO	O	H,L	512Fs output.
88	Vss			Connect to GND.
89	MDSY	O	H,L	Main data sync detection output.
90	LRCK	I		LRCK (=Fs) input from EFM encoder/decoder.
91	BCK	I		BCK (=64Fs) input from EFM encoder/decoder.
92	C2PO	I		C2PO input from EFM encoder/decoder.
93	DATA	I/O	H,L	Data input/output from EFM encoder/decoder.
94	DIDT	I		Digital record input.
95	DODT	O	H,L	REC monitor output/decode audio data output.
96	DIR CPB	O	H,L	Record/playback mode output to EFM encoder/decoder. Record mode at "H", Playback mode at "L".
97	MIN	I		External monitor signal input. Input the signal you want to monitor.
98	TST17	I		Test terminal. Connect to VDD.
99	TST18	O		Test terminal. Use at open.
100	Vss			Connect to GND.

SM5844AF (IC431)



SM5844AF Terminal Function

Pin No.	Symbol	I/O	Function
1 2	DI	ip	Input data.
3 4	BCKI	ip	Input for bit clock.
5	LRCI	ip	Input for word clock (fsi).
6	ICLK	I	Input for system clock.
7	ICKSL	ip	Input for system clock (ICLK) selection H: 384fsi L: 256fsi.
8 9	IFM1	ip	Setting input format using IFM1 and IFM2.
10 11	IFM2	ip	

IFM1 terminal	IFM2 terminal	Word length	Order of data	Data position
L	L	16 bits	MSB first	Right alignment
L	H	20 bits	MSB first	Right alignment
H	L	20 bits	MSB first	Left alignment
H	H	20 bits	LSB first	Right alignment

12 13	VDD	—	Power supply (5V).
14 15	DMUTE	ip	(Direct) Mute.
16	MCOM	ip	Function switching for pin 17 ~ 20.
17	MDT/FSI1	ip	MCOM = "H" Microcomputer data input. : MDT MCOM = "L" De-emphasis frquency setting. : FSI1
18	MDK/FSI2	ip	MCOM = "H" Bit clock for microcomputer data input. : MCK MCOM = "L" De-emphasis frquency setting. : FSI2
19 20	MLEN/DEEM	ip	MCOM = "H" Microcomputer data word Latch clock. : MLEN MCOM = "L" De-emphasis ON/OFF control. : DEEM

Setting input sample frequency (for de-emphasis)

fsi	FSI1	FSI2
32.0 kHz	H	H
44.1 kHz	x	L
48.0 kHz	L	H

Pin No.	Symbol	I/O	Function
21 22	OW18N	ip	Output format setting with OW18N,OW20N
23 24	OW20N	ip	

at IISN = H (Normal mode)

Output format		OW20N	OW18N
16 bit	Right alignment	H	H
18 bit	Right alignment	H	L
20 bit	Right alignment	L	H
20 bit	Left alignment	L	L

at IISN = L (IIS mode)

Output format		OW20N	OW18N
16 bit	IIS mode Left alignment	H	H
18 bit	IIS mode Left alignment	H	L
20 bit	IIS mode Left alignment	L	H
20 bit	IIS mode Left alignment	L	L

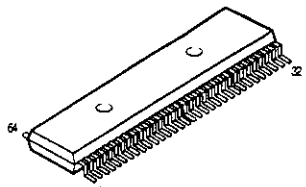
25 26	IISN	ip	IIS output mode selection "H" : Normal mode "L" : IIS mode
27	STATE	O	Output for showing internal operating state (for operation check).
28	TST1N	ip	Output dither control "H" : Dither Off "L" : Dither ON
29	TST2N	ip	Test terminal Set to H
30 31	RSTN	ip	Reset
32 33	Vss	—	GND (0V)
34 35	SLAVE	ip	Mode setting for BCKO and LRCO "H" : Output (Master mode) "L" : Input (Slave mode)
36 37	THRUN	ip	DOUT through mode setting "H" : Normal mode "L" : Through mode
38	OCKSL	ip	Output side system clock (OCLK) selection "H" : 384fs "L" : 256fs
39	OCLK	I	Output system clock input
40	LRCO	O/I	Output side word clock output/input (fso) Output/input mode is set by SLAVE.
41 42	BCKO	O/I	Output side bit clock output/input Output/input mode is set by SLAVE.
43 44	DOUT	O	Data output

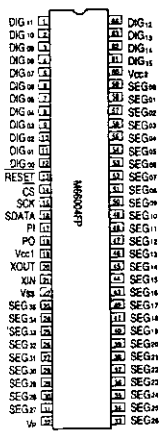
Note 1: [fsi] described above means the frequency of input side word clock (LRCI), and [fso] means the frequency of output side word clock (LRCO).

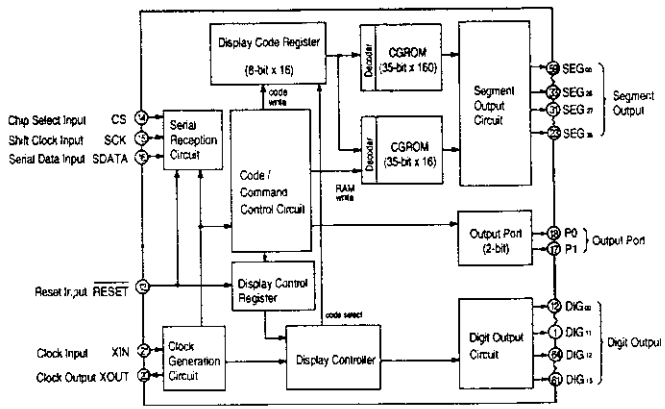
Note 2: I: Input terminal ip: Input terminal with pull-up resistor O: Output terminal (When setting H level, this terminal can be used with open state.)

Note 3: The terminals which have multiple terminal number to the same terminal name can be used connecting to either terminal or both terminals which have same name.

M66004FP (IC301)







M66004FP Terminal Function

Symbol	Name	Function
$\overline{RESET}$	Reset Input	Initializes internal state of M66004.
$\overline{CS}$	Chip Select Input	Able to communicate with MCU in "L" mode. Command from MCU will be disregareded in "H" mode.
SCK	Shift Clock Input	Shifts input data at rise from "L" to "H".
SDATA	Serial Data Input	Inputs character code or command data needed to display from MSB.
XIN XOUT	Clock Input Clock Output	Sets oscillation frequency by connecting external resistor and capacitor (maximum oscillation frequency fosc (max)=1MHz). Also feasible to apply external clock. In this case, injects external clock to Xin terminal and opens Xout terminal.
DIG 00 ~ DIG15	Digit Output	Connect to digit terminal of VFD. DIG00~DIG15 correspond to the 1st figure and 16th figure respectively.
DIG 00 ~ DIG35	Segment Output	Connect to segment terminal of VFD. For corresponding SEG00~SEG35 to segment terminal of VFD, refer to the figure right.
P0, P1		Output port (static movement).
Vcc1		Positive power supply terminal for internal logic.
Vcc2		Positive power supply terminal for high tension output port.
Vss		GND terminal.
Vp		Negative power supply terminal for VFD drive.

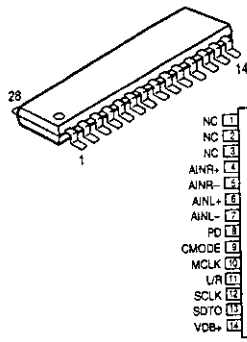
(Forwarding connection of segment output terminal.)

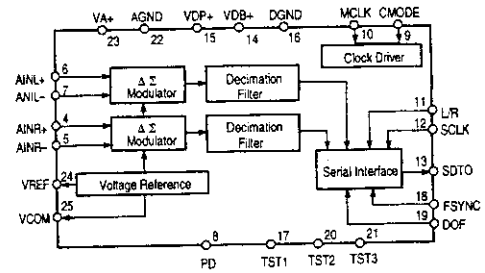
00	01	02	03	04
05	06	07	08	09
10	11	12	13	14
15	16	17	18	19
20	21	22	23	24
25	26	27	28	29
30	31	32	33	34

35

☐ in the right figure indicates 1 dot of segment, the figure in ☐ shows the segment output terminal number (00 ~ 35) to be connected.

AK5345-VS-E1 (IC109)



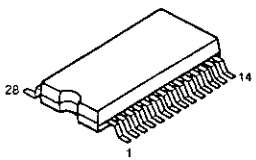


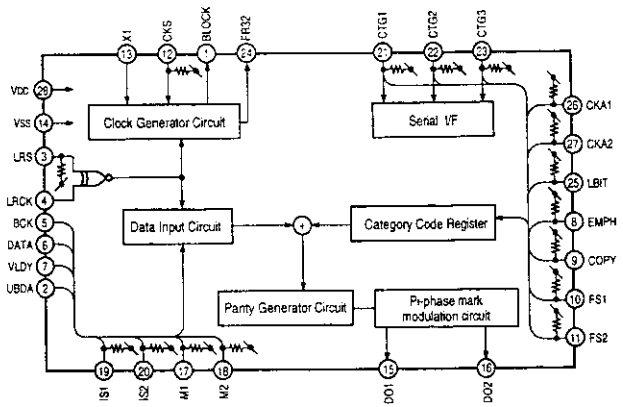
AK5345-VS-E1 Terminal Function

Pin No.	Symbol	I/O	Function
4	AINR+	I	Rch analog positive input terminal.
5	AINR–	I	Rch analog negative input terminal.
6	AINL+	I	Lch analog positive input terminal.
7	AINL–	I	Lch analog negative input pin.
8	PD	I	Power down terminal. Becomes "H" in power down mode. From "↓" offset calibration will start. When tuning ON the power or shift the frequency, make sure to perform calibration once.
9	CMODE	I	Master clock selection terminal. "L": CLK=256 fs (12.288 MHz @ fs=48 kHz) "H": CLK=384 fs (18.432 Mhz @ fs=48 kHz)
10	MCLK	I	Master clock input terminal. CMODE="H": 384 fs CMODE="L": 256 fs
11	L/R	I	Input channel selection terminal. Inputs fs clock. When DOF="L", outputs Lch at "H", Rch at "L". When DOF="H", polarity is reversed.
12	SCLK	I	Serial data clock terminal. With "↓" of this terminal, outputs 1-bit of output data. Inputs 32 fs – 64 fs clock.
13	SDTO	O	Serial data output terminal. Data is output by close forwarded 2's compliment, MSB first, 16-bit. After output 16-bit, outputs "L". Mode is "L" at a time power down (PD="H").
14	VDB+	—	Power supply terminal of digital section, +5V (silicon PWB potential).
15	VDP+	—	Power supply terminal of digital section, +5V.
16	DGND	—	Ground terminal of digital section.
17	TST1	I	Test pin. Make this terminal opened or "L".
18	FSYNC	I	Frame sync clock terminal. SDATA will be shifted by SCLK at "H".
19	DOF	I	Digital output format terminal. "L": Close to forward "H" I²S interchange format
20	TST2	O	Test terminal. Use as opened.
21	TST3	O	Test terminal. Use as opened.
22	AGND	—	Analog ground terminal.
23	VA+	—	Analog power supply terminal. +5V.
24	VREF	O	Reference voltage output terminal, (VA+) –3.0V Between VA+ connect a 10μF or lesser electrolytic capacitor and a 0.1μF ceramic capacitor.
25	VCOM	O	Common voltage output terminal, (VA+) –2.5V. Between VA+ connect a 0.1μF ceramic capacitor.

Note: All other terminals except the above are no connection (NC). NC terminals are not bonded internally.

TC9271F (IC432)





TC9271F Terminal Function

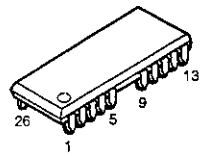
Pin No.	Symbol	I/O	Function	Remarks
1	BLOCK	O	Block head position output.	
2	UBDA	I	User bit data input.	
3	LRS	I	LRCK polarity selection.	with pull-up resistor
4	LRCK	I	LR clock input.	
5	BCK	I	Bit clock input.	
6	DATA	I	2ch: Data input. / 4ch: Data input 1.	
7	VLDY	I	2ch: Compensation flag input. / 4ch: Data input 2.	
8	EMPH	I	Emphasis flag setting.	with pull-up resistor
9	COPY	I	P: Copy flag setting. / S: "H" fixed.	with pull-up resistor
10	FS1	I	Sampling frequency setting 1.	with pull-up resistor
11	FS2	I	Sampling frequency setting 2.	with pull-up resistor
12	CKS	I	Clock dividing count selection.	with pull-up resistor
13	XI	I	Clock input.	
14	Vss	—	Ground.	
15	DO1	O	Digital data output 1.	
16	DO2	O	Digital data output 2.	
17	M1	I	Channel mode setting 1. / Setting 2ch or 4ch.	with pull-up resistor
18	M2	I	Channel mode setting 2. / Setting 2ch or 4ch.	with pull-up resistor
19	IS1	I	Data input mode setting 1.	with pull-up resistor
20	IS2	I	Data input mode setting 2.	with pull-up resistor
21	CTG1	I	P: Category code setting 1. / S: Data input.	with pull-up resistor
22	CTG2	I	P: Category code setting 2. / S: Clock input.	with pull-up resistor
23	CTG3	I	P: Category code setting 3. / S: Latch pulse input.	with pull-up resistor
24	FR32	O	ER32 output.	
25	LBIT	I	P: LBIT input. / S: 32/192 bits switching.	with pull-up resistor
26	CKA1	I	P: Clock accuracy setting 1. / S: "H" fixed.	with pull-up resistor
27	CKA2	I	P: Clock accuracy setting 2. / S: Output, inhibit at "H".	with pull-up resistor
28	VDD	—	Power supply	

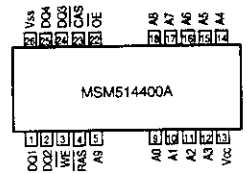
LRS / LRCK

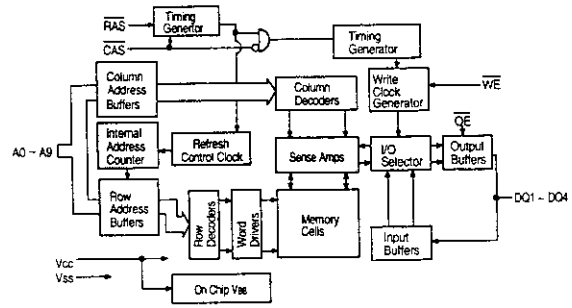
LRS	LRCK L	LRCK H
L level	R channel data	L channel data
H level	L channel data	R channel data

Note: 2ch described in the function above means 2 channel mode, and 4ch means 4 channel mode.
Also P means parallel setting mode, and S means serial setting mode.
Use FS1 (pin 10) and FS2 (pin 11) for these mode setting.

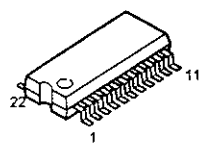
SM514400A-70SJ-ADR1 (IC802)

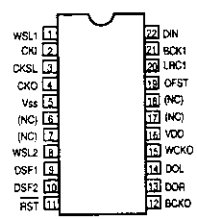




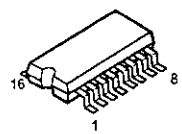


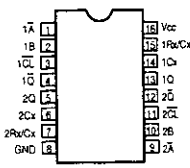
SM5841HS (IC610)



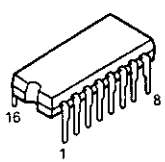


TC74HC123AF (IC414)

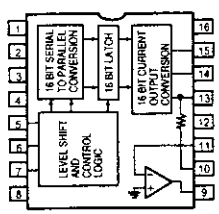




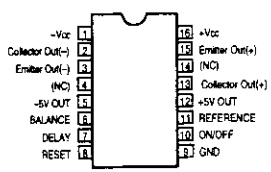
PCM61P-L (IC611, 612)
M5290P (IC601)



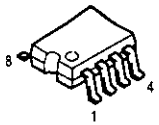
PCM61P



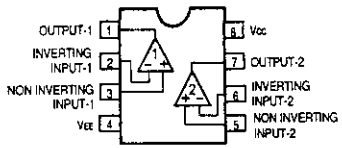
M5290P



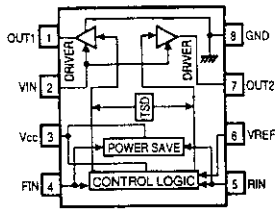
BA4510F (IC107, 108)
BA6287F (IC104)



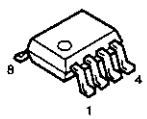
BA4510F

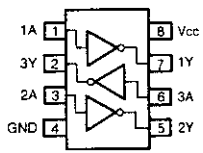


BA6287F

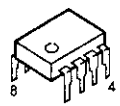


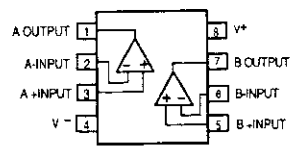
TC7WU04F (IC304, 541, 614, 804)



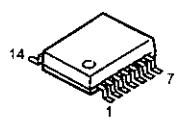


TC7WU04F (IC304, 541, 614, 804)

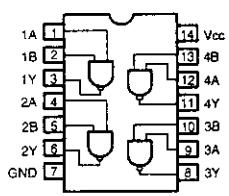




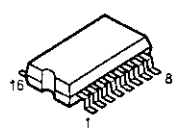
TC74HC00AF

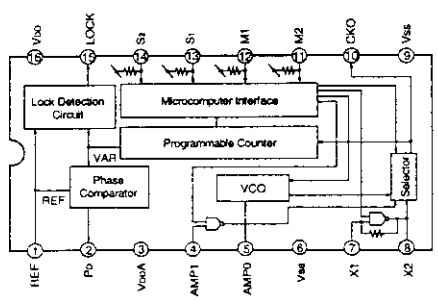


TC74HC00AF

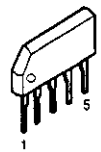


TC9246F (IC803)

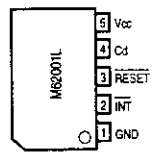


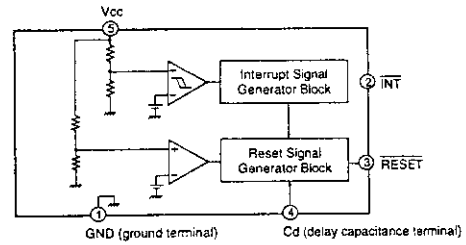


M62005L (IC602)

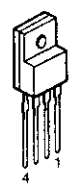


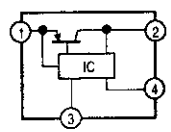
PIN CONNECTION DIAGRAM (Upper)





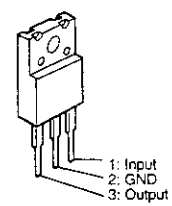
PQ30RV21 (IC608)



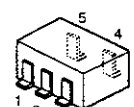


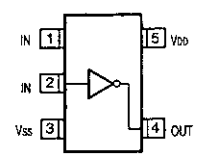
1: DC Input (Vin)
2: DC Output (Vo)
3: GND
4: ON/OFF Control terminal

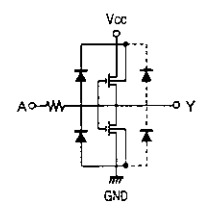
NJM7805FA (IC609)
NJM7806FA (IC616)



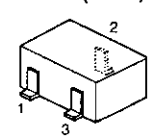
TS7SU04F (IC433, 805)



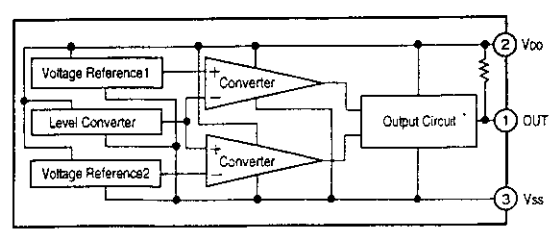




MN1382-S (IC305)

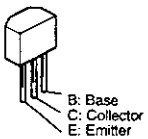


Pin	Symbol	Function
1	OUT	Reset Signal Output
2	Vdd	Power Supply
3	Vss	Ground

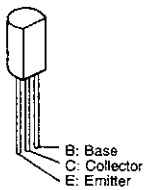


● TRANSISTOR

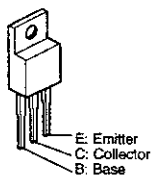
2SA1048 (Y/GR)
2SA933S (S)



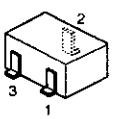
2SB562 (C)



2SB1274
2SD1913

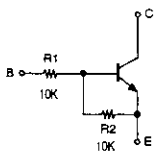


DTA124XKA
DTC114EK
DTC124EK
DTC144EK
DTC323TK

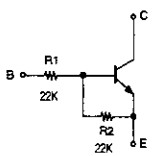


1: Emitter
2: Base
3: Collector

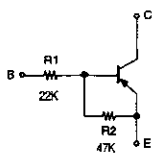
DTC114EK



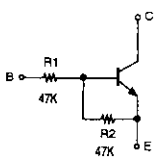
DTC124EK



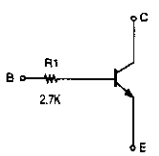
DTA124XKA



DTC144EK

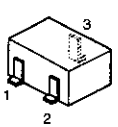


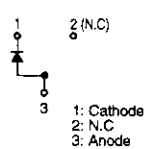
DTC323TK



● DIODE

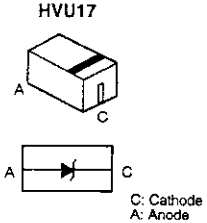
MA151A





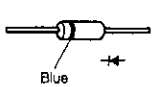
1: Cathode
2: N.C
3: Anode

HVU17

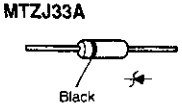


C: Cathode
A: Anode

1SR35-200A

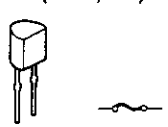


MTZJ7.5A
MTZJ33A

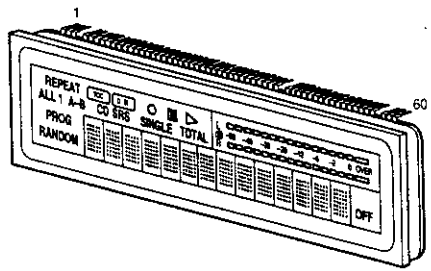


● IC PRODECTOR

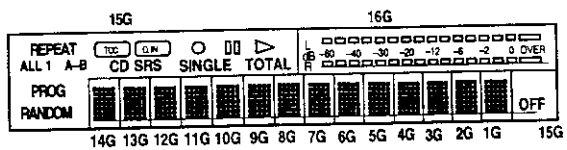
ICP-N15 (IC603, 605, 607)
ICP-N20 (IC604, 606)

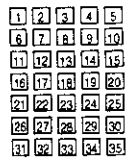


● FL DISPLAY FIP14XM1DA (Part No. : 393 8019 005) (FL301)



Grid partition





Pin Connection

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Electrode	F1	F1	F1	NP	P S35	P S34	P S33	P S32	P S31	P S30	P S29	P S28	P S27	P S26	P S25	P S24	P S23	P S22	P S21	P S20
Pin No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Electrode	P S19	P S18	P S17	P S16	P S15	P S14	P S13	P S12	P S11	P S10	P S9	P S8	P S7	P S6	P S5	P S4	P S3	P S2	P S1	NP
Pin No.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Electrode	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NP	F2	F2	F2

Note: F: Filament G: Grid P: Anode NP: No Pin

Internal Connection

	1-14G	15G	18G
S1	1	TOTAL	1
S2	2	▶	2
S3	3	SINGLE	3
S4	4	▮▮	4
S5	5	○	5
S6	6	CD SRS	6
S7	7	D. IN	7
S8	8	TOC	8
S9	9	B	9
S10	10	A-	10
S11	11	1	11
S12	12	REPEAT	12

	1-14G	15G	18G
S13	13	ALL	13
S14	14	RANDOM	14
S15	15		15
S16	16		16
S17			
S18	18		18
S19	19		19
S20	20		20
S21	21		21
S22	22		22
S23	23		23
S24	24		24

	1-14G	15G	18G
S25	25	ALL	25
S26	26	RANDOM	26
S27	27		27
S28	28		28
S29	29		29
S30	30		30
S31	31		31
S32	32		32
S33	33		33
S34	34		34
S35	35	OFF	

NOTE FOR PARTS LIST

- Part indicated with the mark * ◉ * are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "l" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:
Parts marked with this symbol ⚠ ■ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

● Resistors

Ex.: RN (Type) 14K (Shape and performance) 2E (Power) 182 (Resistance) G (Allowable error) FR (Others)

RD : Carbon RC : Composition RS : Metal oxide film RW : Winding RN : Metal film RK : Metal mixture	2B : 1/8W 2E : 1/4W 2H : 1/2W 3A : 1W 3D : 2W 3F : 3W 3H : 5W	F : ±1% G : ±2% J : ±5% K : ±10% M : ±20%	P : Pulse-resistant type NL : Low noise type NB : Non-burning type FR : Fuse-resistor F : Lead wire forming

• Resistance

1 8 2 ⇒ 1800 ohm = 1.8 kohm
1-8: Indicates number of zeros after effective number.
2: 2-digit effective number
• Units: ohm

1 R 2 ⇒ 1.2 ohm
1: 1-digit effective number.
R: Indicates decimal point
2: 2-digit effective number, decimal point indicated by R.
• Units: ohm

● Capacitors

Ex.: CE (Type) 04W (Shape and performance) 1H (Dielectric strength) 2R2 (Capacity) M (Allowable error) BP (Others)

CE : Aluminum foil electrolytic CA : Aluminum solid electrolytic CS : Tantalum electrolytic CQ : Film CK : Ceramic CC : Ceramic CP : Oil CM : Mica CF : Metallized CH : Metallized	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V 2A : 100V 2B : 125V 2C : 160V 2D : 200V 2E : 250V 2H : 500V 2J : 630V	F : ±1% G : ±2% J : ±5% K : ±10% M : ±20% Z : +80% -20% P : +100% -0% C : ±0.25pF D : ±0.5pF ∞ : Others	HS : High stability type BP : Non-polar type HR : Ripple-resistant type DL : For charge and discharge HF : For assuring high frequency U : UL part C : CSA part W : UL-CSA type F : Lead wire forming	

• Capacity (electrolyte only)

2 2 2 ⇒ 2200μF
2-2: Indicates number of zeros after effective number.
2: 2-digit effective number.
• Units: μF.

2 R 2 ⇒ 2.2μF
2: 1-digit effective number.
R: Indicates decimal point
2: 2-digit effective number, decimal point indicated by R.
• Units: μF.

• Capacity (except electrolyte)

2 2 2 ⇒ 2200pF = 0.0022μF
2-2: (More than 2) Indicates number of zeros after effective number.
2: 2-digit effective number.
• Units: μF.

2 2 1 ⇒ 220pF
2-1: (0 or 1) Indicates number of zeros after effective number.
2: 2-digit effective number.
• Units: pF.

* When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

P.W.B UNIT ASS'Y PARTS LIST

2U-2927 INTERFACE UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC800	262 2225 106	IC M37610MD-***FP	
IC801	262 2224 000	IC CXD2536R	
IC802	262 2027 906	IC MSM514400A-70SJDR1	
IC805	262 1738 908	IC TC7SU04F	
TR800	269 0082 902	Transistor DTC114EK	
RESISTORS GROUP (Not Included Carbon Film ±5% 1/4W)			
R800-804	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R805-808	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R809	247 0014 967	Chip 1Mohm 1/10W	RM73B--105J
R810	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R811-821	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R822,823	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R824	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R825	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R826,827	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R828	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R829-834	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R835,836	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R837	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R838	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R839	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R840-845	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R846-853	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R854-859	247 0005 989	Chip 220ohm 1/10W	RM73B--221J
R868,869	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
CAPACITORS GROUP			
C800,801	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C802	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M
C804	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C806	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C807,808	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C809	257 0001 993	Ceramic (Chip) 7pF/50V	CC73SL1H7R0D
C810	257 0001 977	Ceramic (Chip) 5pF/50V	CC73SL1H5R0C
C812,813	257 0002 921	Ceramic (Chip) 10pF/50V	CC73SL1H100D
C815	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C822	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F18104Z
C825	257 0004 929	Ceramic (Chip) 68pF/50V	CC73SL1H680J
OTHER GROUP			
CN800	205 0995 914	30P FFC Connector base	
CN801	205 0995 901	18P FFC Connector base	
L800	235 0107 910	Coil LEM4532TR68M	
L801	235 0107 923	Coil LEM4532T1R2M	
L802,803	235 0049 007	Beads inductor	
X800	399 0160 002	CST9.00MTW-TF1	
X801	399 0239 904	Crystal Oscillator (45.1584MHz)	

2U-2926K MAIN UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC104	263 0994 908	IC BA6287F	
IC107,108	263 0934 900	IC BA4510F-T1	
IC109	262 2016 904	IC AK5345-VS-E1	
IC301	262 1954 009	IC M66004FP	
IC302	499 0290 007	IC GP1U271X	
IC303	262 2264 206	IC HD6433836	
IC304	262 1953 903	IC TC7WU04F	
IC305	262 1647 905	IC MN1382-S (TX)	
IC410	262 1718 902	IC TC74HC00AF	
IC412	262 1718 902	IC TC74HC00AF	
IC413	262 2183 002	IC LC8903Q	
IC414	262 1348 903	IC TC74HC123AF	
IC424	262 1718 902	IC TC74HC00AF	
IC431	262 2272 007	IC SM5844AF	
IC432	262 2271 901	IC TC9271F (EL)	
IC433	262 1738 908	IC TC7SU04F	
IC541	262 1953 903	IC TC7WU04F	
IC601	263 0693 005	IC M5290P	
IC602	262 2306 009	IC M62005L	
IC603	268 0073 905	IC ICP-N15	
IC604	268 0074 904	IC ICP-N20	
IC605	268 0073 905	IC ICP-N15	
IC606	268 0074 904	IC ICP-N20	
IC607	268 0073 905	IC ICP-N15	
IC608	263 1027 007	IC PQ30RV21	
IC609	263 0553 006	IC NJM7805FA	
IC610	262 2210 904	IC SM5841HS	
IC611,612	262 1409 004	IC :PCM61P-L	
IC613	263 0565 007	IC BA15218	
IC614	262 1953 903	IC TC7WU04F	
IC616	263 0793 002	IC NJM7806FA (S)	
IC803	262 1883 905	IC TC9246F-TP1	
IC804	262 1953 903	IC TC7WU04F	
TR201	269 0082 902	Transistor DTC114EK	
TR301	269 0102 905	Transistor DTC124EK	
TR411	269 0082 902	Transistor DTC114EK	
TR412	271 0194 009	Transistor 2SA1048 (Y/GR)	
TR601	274 0036 905	Transistor 2SD468 (C)	
TR602	272 0129 007	Transistor 2SB1566 (E/F)	
TR603	269 0054 901	Transistor DTC144EK	
TR604	269 0156 906	Transistor DTA124XKA	
TR605	269 0082 902	Transistor DTC114EK	

Ref. No.	Part No.	Part Name	Remarks
TR606,607	269 0066 902	Transistor DTC323TK	
TR608	272 0025 004	Transistor 2SB562 (C)	
TR611,612	269 0066 902	Transistor DTC323TK	
TR617,618	269 0156 906	Transistor DTA124XKA	
TR630,631	269 0082 902	Transistor DTC114EK	
TR632	271 0192 002	Transistor 2SA933S (S)	
ZD601	276 0645 965	Zener Diode MTZJ33A	
ZD602	276 0644 911	Zener Diode MTZJ7.5A	
D301	276 0438 910	Diode MA151A	
D401-405	276 0438 910	Diode MA151A	
D601-607	276 0519 004	Diode 1SR35-200A	
D608,609	276 0438 910	Diode MA151A	
D610,611	276 0519 004	Diode 1SR35-200A	
D612	276 0438 910	Diode MA151A	
D613	276 0519 004	Diode 1SR35-200A	
D614	276 0438 910	Diode MA151A	
D615,616	276 0519 004	Diode 1SR35-200A	
D617,618	276 0438 910	Diode MA151A	
D620,621	276 0519 004	Diode 1SR35-200A	
D622	276 0438 910	Diode MA1S1A	
D800	276 0625 901	Diode HVU17	
RESISTORS GROUP (Not included Carbon Film ±5% 1/4W)			
VR601	211 0868 004	Variable Resistor 10kohm A	V0920P07FA103
VR602,603	211 6093 970	Semi Fixed Resistor 100kohm	V06PB104 200
VR701	211 0867 005	Variable resistor 20kohm A	V0920P13FA203
R113,114	247 0004 964	Chip 68ohm 1/10W	RM73B--680J
R191,192	247 0009 901	Chip 4.7kohm 1/10W	RM73B--472J
R193,194	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R197,198	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R199,200	247 0011 928	Chip 39kohm 1/10W	RM73B--393J
R201-204	247 0009 901	Chip 4.7kohm 1/10W	RM73B--472J
R205,206	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R207,208	247 0018 905	Chip 0ohm 1/10W	RM73D--0R0K
R209-212	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R213-216	247 0005 947	Chip 150ohm 1/10W	RM73B--151J
R217,218	247 0009 901	Chip 4.7kohm 1/10W	RM73B--472J
R219	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R301	247 0007 945	Chip 1kohm 1/10w	RM73B--102J
R302	247 0005 947	Chip 150ohm 1/10W	RM73B--151J
R303	247 0005 963	Chip 180ohm 1/10W	RM73B--181J
R304	247 0006 904	Chip 270ohm 1/10W	RM73B--271J
R305	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R306	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R307	247 0005 963	Chip 180ohm 1/10W	RM73B--181J

Ref. No.	Part No.	Part Name	Remarks
R308	247 0006 904	Chip 270ohm 1/10W	RM73B--271J
R309	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R310	247 0005 947	Chip 150ohm 1/10W	RM73B--151J
R311	247 0005 963	Chip 180ohm 1/10W	RM73B--181J
R313	247 0005 947	Chip 150ohm 1/10W	RM73B--151J
R314	247 0005 963	Chip 180ohm 1/10W	RM73B--181J
R315	247 0006 904	Chip 270ohm 1/10W	RM73B--271J
R317,318	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R328, 329	247 0009 082	Chip 10kohm1/10W	RM73B--103J
R340	247 0010 084	Chip 27kohm 1/10W	RM73B--273J
R341-343	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R344,345	247 0005 905	Chip 1kohm 1/10W	RM73B--102J
R350	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R354-356	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R359	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R360-362	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R363	247 0014 967	Chip 1Mohm 1/10W	RM73B--105J
R364-369	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R370	247 0009 985	Chip 10kohm 1/10W	RM73B--103J
R401	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R414	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R415	247 0006 962	Chip 470ohm 1/10W	RM73B--471J
R419	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R420	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R421	247 0014 967	Chip 1Mohm 1/10W	RM73B--105J
R422	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R451	247 0004 977	Chip 75ohm 1/10W	RM73B--750J
R452	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R453	247 0013 942	Chip 330kohm 1/10W	RM73B--334J
R454	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R455	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R456	247 0011 902	Chip 33kohm 1/10W	RM73B--333J
R459-461	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R462,463	247 0006 962	Chip 4.7kohm 1/10W	RM73B--471J
R464	247 0009 914	Chip 5.1kohm 1/10W	RM73B--512J
R465	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R466	247 0013 997	Chip 510kohm 1/10W	RM73B--514J
R467	247 0005 921	Chip 120ohm 1/10W	RM73B--121J
R468,469	247 0009 927	Chip 5.6kohm 1/10W	RM73B--562J
R470	247 0010 974	Chip 24kohm 1/10W	RM73B--243J
R472	247 0005 976	Chip 200ohm 1/10W	RM73B--201J
R473	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R474-477	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R491	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R492	247 0006 962	Chip 470ohm 1/10W	RM73B--471J
R495	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R498	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R601,602	247 0009 901	Chip 4.7kohm 1/10W	RM73B--472J
R603	247 0007 945	Chip 1kohm 1/10w	RM73B--102J
R604	247 0004 922	Chip 47ohm 1/10W	RM73B--470J

Ref. No.	Part No.	Part Name	Remarks
R607	247 0012 998	Chip 200kohm 1/10W	RM73B--204J
R613-616	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R617,618	247 0012 998	Chip 200kohm 1/10W	RM73B--204J
R619,620	247 0013 984	Chip 470kohm 1/10W	RM73B--474J
R621,622	247 0014 967	Chip 1Mohm 1/10W	RM73B--105J
R623,624	247 0007 929	Chip 820ohm 1/10W	RM73B--821J
R625,626	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R627,628	247 0010 990	Chip 30kohm 1/10W	RM73B--303J
R629,630	247 0007 903	Chip 680ohm 1/10W	RM73B--681J
R631,632	247 0008 944	Chip 2.7kohm 1/10W	RM73B--272J
R635,636	247 0012 927	Chip 1Mohm 1/10W	RM73B--104J
R637,638	247 0009 969	Chip 8.2kohm 1/10W	RM73B--822J
R639,640	247 0011 902	Chip 33kohm 1/10W	RM73B--333J
R641,642	247 0004 948	Chip 56ohm 1/10W	RM73B--560J
R643	247 0013 942	Chip 330kohm 1/10W	RM73B--334J
R644	247 0008 944	Chip 2.7kohm 1/10W	RM73B--272J
R645	247 0005 905	Chip 100ohm 1/10W	RM73B--101J
R646	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R647	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R648	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R649	247 0008 944	Chip 2.7kohm 1/10W	RM73B--272J
R650	247 0003 981	Chip 33ohm 1/10W	RM73B--330J
R652	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R653	247 0008 915	Chip 2kohm 1/10W	RM73B--202J
R654,655	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R656,657	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R664	247 0010 055	Chip 20kohm 1/10W	RM73B--203J
R666	247 0009 901	Chip 4.7kohm 1/10W	RM73B--472J
R667	247 0011 902	Chip 33kohm 1/10W	RM73B--333J
R668	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R681	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R683,684	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R685	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R686	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R690	247 0008 960	Chip 3.3kohm 1/10W	RM73B--332J
R691	247 0012 927	Chip 100kohm 1/10W	RM73B--104J
R692	247 0011 944	Chip 47kohm 1/10W	RM73B--473J
R693,694	247 0005 905	Chip 100ohm 1/10W	RM73B--101J
R701,702	247 0009 082	Chip 10kohm 1/10W	RM73B--103J
R741	247 0012 998	Chip 200kohm 1/10W	RM73B--204J
R860	247 0006 962	Chip 470ohm 1/10W	RM73B--471J
R861	247 0014 967	Chip 1Mohm 1/10W	RM73B--105J
R862,863	247 0007 945	Chip 1kohm 1/10W	RM73B--102J
R864-867	247 0010 929	Chip 15kohm 1/10W	RM73B--153J
R995,996	247 0018 905	Chip 0ohm 1/10W	RM73B--0R0K
R999	247 0018 905	Chip 0ohm 1/10W	RW73B--0R0K

Ref. No.	Part No.	Part Name	Remarks
CAPACITORS GROUP			
C102	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C131,132	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C133,134	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C135,136	257 0004 929	Ceramic (Chip) 68pF/50V	CC73SL1H680J
C137,138	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C139,140	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C141,142	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C143,144	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M
C149,150	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C151,152	257 0007 942	Ceramic (Chip) 1500pF/50V	CC73SL1H152J
C155,156	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C157,158	254 4254 909	Electrolytic 10μF/16V	CE04W1C100M
C159	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C160	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M
C170	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C171	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C302	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C303	257 0014 948	Ceramic (Chip) 0.22μF/25V	CK73F1E224Z
C309	257 0004 961	Ceramic (Chip) 100pF/50V	CC73SL1H101J
C310-312	257 0007 900	Ceramic (Chip) 1000pF/50V	CC73SL1H102J
C317	257 0007 900	Ceramic (Chip) 1000pF/50V	CC73SL1H102J
C320	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C321-323	257 0005 931	Ceramic (Chip) 200pF/50V	CC73SL1H201J
C324,325	257 0012 966	Ceramic (Chip) 0.01μF/25V	CK73F1E103Z
C326	257 0004 961	Ceramic (Chip) 100pF/50V	CC73SL1H101J
C327	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C350,351	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C352	254 4252 930	Electrolytic 100μF/25V	CE04W1A101M
C353	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C354	254 4250 916	Electrolytic 47μF/6.3V	CE04W0J470M
C355	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C356	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C450	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H472K
C452	254 4260 045	Electrolytic 1μF/50V	CE04W1H010M
C453	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C458,459	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C461	257 0003 988	Ceramic (Chip) 47pF/50V	CC73SL1H470J
C462	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C463	257 0005 902	Ceramic (Chip) 150pF/50V	CC73SL1H151J
C464	257 0007 900	Ceramic (Chip) 1000pF/50V	CC73SL1H102J
C465	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C466	254 4250 916	Electrolytic 47μF/6.3V	CE04W0J470M
C467	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C470	2570009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C471	254 4254 022	Electrolytic 33μF/16V	CE04W1C330M
C472	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C473	257 0013 910	Ceramic (Chip) 0.068μF/50V	CK73F1H683Z
C474	254 4250 916	Electrolytic 47μF/6.3V	CE04W0J470M
C475,476	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K

Ref. No.	Part No.	Part Name	Remarks
C478	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C479	254 4260 003	Electrolytic 0.1μF/50V	CE04W1H0R1M
C480	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C481,482	257 0002 921	Ceramic (Chip) 10pF/50V	CC73SL1H100D
C486, 487	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H472K
C500,501	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C526	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C527	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M
C529	254 4250 932	Electrolytic 220μF/6.3V	CE04W0J221M
C530,531	257 0002 921	Ceramic (Chip) 10pF/50V	CC73SL1H100D
C532	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C598	257 0012 966	Ceramic (Chip) 0.01μF/50V	CK73F1H103Z
C601,602	254 4255 717	Electrolytic 4700μF/16V	CE04W1C472MC
C603,604	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C605,606	254 4254 941	Electrolytic 220μF/16V	CE04W1C221M
C607,608	254 4260 964	Electrolytic 3.3μF/50V	CE04W1H3R3M
C609	254 4260 948	Electrolytic 1μF/50V	CE04W1H010M
C610	254 4442 711	Electrolytic 10000μF/16V	CE04W1C103MC
C611,612	254 4254 941	Electrolytic 100μF/16V	CE04W1C101M
C613,614	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C615,616	254 4250 929	Electrolytic 100μF/6.3V	CE04W0J101M
C617	254 4254 954	Electrolytic 220μF/16V	CE04W1C221M
C619	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C620	254 4254 051	Electrolytic 220μF/16V	CE04W1C221M
C621	254 4260 980	Electrolytic 10μF/50V	CE04W1H100M
C622	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1M472K
C624-627	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73F1H472K
C628-631	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C632,633	254 4254 954	Electrolytic 100μF/16V	CE04W1C101M
C634,635	257 0006 969	Ceramic (Chip) 680pF/50V	CC73SL1H681J
C636,637	257 0009 979	Ceramic (Chip) 5600pF/50V	CK73B1H562K
C638,639	254 4250 941	Electrolytic 10μF/16V	CE04W1C100M
C642,643	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C646	254 4255 717	Electrolytic 4700μF/16V	CE04W1C472M
C650,651	254 4260 980	Electrolytic 10μF/50V	CE04W1H100M
C652	257 0012 982	Ceramic (Chip) 0.022μF/50V	CK73F1H223Z
C653,654	257 0014 935	Ceramic (Chip) 0.1mF/25V	CK73F1E104Z
C655	259 0009 001		GOLDCAP=105=
C656	257 0014 935	Ceramic (Chip) 0.1mF/25V	CK73F1E104Z
C657	254 4254 909	Electrolytic 10mF/16V	CE04W1C100M
C658	254 4258 934	Electrolytic 33mF/35V	CE04W1V330M
C670	254 4261 918	Electrolytic 47mF/50V	CE04W1H470M
C671	254 4260 980	Electrolytic 10mF/50V	CE04W1H100M
C672	254 4258 934	Electrolytic 33mF/35V	CE04W1V330M
C673	257 0014 935	Ceramic (Chip) 0.1mF/25V	CK73F1E104Z
C682,683	257 0007 900	Ceramic (Chip) 1000pF/50V	CC73SL1H102J
C690	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H472K
C816	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H472K
C817,818	257 0007 900	Ceramic (Chip) 1000pF/50V	CC73SL1H102J
C819	257 0012 924	Ceramic (Chip) 2200pF/50V	CK73F1H222Z

Ref. No.	Part No.	Part Name	Remarks
C820	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H427K
C821	257 0014 935	Ceramic (Chip) 0.1μF/25V	CK73F1E104Z
C822	254 4250 929	Electrolytic 100μF/6.3V	CE04W0J101M
C823	257 0009 966	Ceramic (Chip) 4700pF/50V	CK73B1H472K
C824	257 0004 929	Ceramic (Chip) 68pF/50V	CC73SL1H680J
OTHER GROUP			
FB108	253 0049 007	Beads Inductor	
FB601,602	253 0049 007	Beads Inductor	
FB610	253 0049 007	Beads Inductor	
L400-402	253 0049 007	Beads Inductor	
L600	253 0049 007	Beads Inductor	
L800	235 0060 950	Inductor	
L999	239 8019 002	Line Filter Coil	
X301	399 0160 002	CST8.00MTW	
X401,402	399 0165 007	Crystal Oscillator (16.9344MHz)	
	202 0040 909	Fuse Clip	
F602,603	206 1015 016	Fuse (1.25A)	
	513 0654 033	Fuse Label (1.25A)	
S301	212 0351 019	Rotary Switch (RK09K)	
S302-316	212 5604 910	Tact Switch	
S320	212 0351 019	Rotary Switch (RK09K)	
S321	212 0375 007	Rotary Encoder	
S801	212 1039 000	1P Push Switch	
FL301	393 8019 005	FL Tube FPI14XM1DA	
	461 0862 003	FL Spacer	
JK601	204 8546 003	4P RCA Pin Jack (W.SPLAT)	
JK602	204 8178 031	1P Pin Jack	
JK605	269 0098 006	Optical Input GP1F32T (OPT.OUT)	
JK606	269 0097 007	Optical output GP1F32R (OPT.IN)	
JK607	204 8341 004	Headphone Jack	
	417 0476 007	Radiator	TR602, IC616
	471 3304 015	Screw 3 x 8	3 x 8 CBS-Z
CB2D,2E	205 0581 001	2P VH Connector base	
	233 9683 002	Power supply transformer	
W601	203 0486 016	Wire 1P SIN-SRA(4T)	
	205 0452 017	Style pin	
CN101,102	205 1021 007	17P JE Connector receptacle	
CN103	205 0760 000	6P Connector base	
CN104	205 0549 098	33P FFC Connector base	

Ref. No.	Part No.	Part Name	Remarks
CN105	205 0233 045	4P EH Connector base	
CN106	205 0277 043	4P EH Connector base (Red)	
CN107	205 0343 058	5P Connector base (KR-PH)	
CN301	205 0549 098	33P FFC Connector base	
CN303	205 0343 032	3P Connector base (KR-PH)	
CN601	203 4516 050	3P Connector cord (KR-DA)	
CN602	205 0343 032	3P Connector base (KR-PH)	
CN604	205 0343 058	5P Connector base (KR-PH)	
CN605,606	205 0343 074	7P Connector base (KR-PH)	
CN701	205 0343 058	5P Connector base (KR-PH)	
CN702	203 8207 051	5P Connector cord (KR-DA)	
CN801	203 4612 006	3P Connector cord (KR-DS)	

MD MECHANISM UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC101	S87 5207 268	IC CXA1981R	
IC102	262 1738 908	IC TC7SU04F	
IC121	S87 5237 536	IC CXD2535BR	
IC122	262 1738 908	IC TC7SU04F	
IC123	S87 5905 859	IC TC7SU04FU-TE85L	
IC151	S87 5017 960	IC MPC17A38VMEL	
IC171	S87 5950 412	IC X24C01S	
IC172	S87 5914 973	IC μPC842G2	
IC181	262 1955 901	IC TC74ACT540FS	
IC182	262 1738 908	IC TC7SU04F	
IC191	S87 5982 299	IC L88MS05T-FA	
Q101	S87 2990 512	Transistor DTA144EU	Built-in Resistor
Q151	S87 2990 518	Transistor DTC144EU	Built-in Resistor
Q162	S87 2910 107	Transistor 2SB798-DL	
Q163	S87 2990 512	Transistor DTA144EU	Built-in Resistor
Q164	S87 2992 419	Transistor DTA123JU	Built-in Resistor
Q181	S87 2901 875	Transistor 2SJ278MY	
Q182	S87 2901 765	Transistor 2SK1764KY	
D101	S87 1998 862	Diode 1SS355	
D155	S87 1903 117	Diode 1SS322	
D161	S87 1942 115	Zener Diode MA8027-L	
D181	S87 1903 360	Diode F1P2STP	
D183	S87 1903 360	Diode F1P2STP	
RESISTORS GROUP (Not included Carbon Film ±5% 1/4W)			
RV101	S12 4039 711	Semi Fixed Resistor 47kohm	Metal Glaze
RV102	S12 4139 611	Semi Fixed Resistor	
RV105	S12 4139 511	Semi Fixed Resistor 10kohm	
R101	S12 1606 100	Carbon (Chip) 3.3kohm 1/10W	
R102	S12 1607 300	Carbon (Chip) 10kohm 1/10W	
R103	S12 1607 300	Carbon (Chip) 10kohm 1/10W	
R104	S12 1604 900	Carbon (Chip) 1kohm 1/10W	
R105	S12 1606 500	Carbon (Chip) 4.7kohm 1/10W	
R106	S12 1613 300	Carbon (Chip) 3.3Mohm 1/10W	
R107	S12 1611 300	Carbon (Chip) 470kohm 1/10W	
R114	S12 1602 500	Carbon (Chip) 100ohm 1/10W	
R116	S12 1606 900	Carbon (Chip) 6.8kohm 1/10W	
R117	S12 1611 300	Carbon (Chip) 470kohm 1/10W	
R120	S12 1602 500	Carbon (Chip) 100ohm 1/10W	
R121	S12 1609 700	Carbon (Chip) 100kohm 1/10W	
R122	S12 1629 500	Carbon (Chip) 0ohm 1/10W	
R123	S12 1603 700	Carbon (Chip) 330ohm 1/10W	
R124	S12 1602 500	Carbon (Chip) 100ohm 1/10W	
R125	S12 1602 500	Carbon (Chip) 100ohm 1/10W	
R128	S12 1605 300	Carbon (Chip) 1.5kohm 1/10W	
R129	S12 1603 700	Carbon (Chip) 330ohm 1/10W	
R130	S12 1604 100	Carbon (Chip) 470ohm 1/10W	

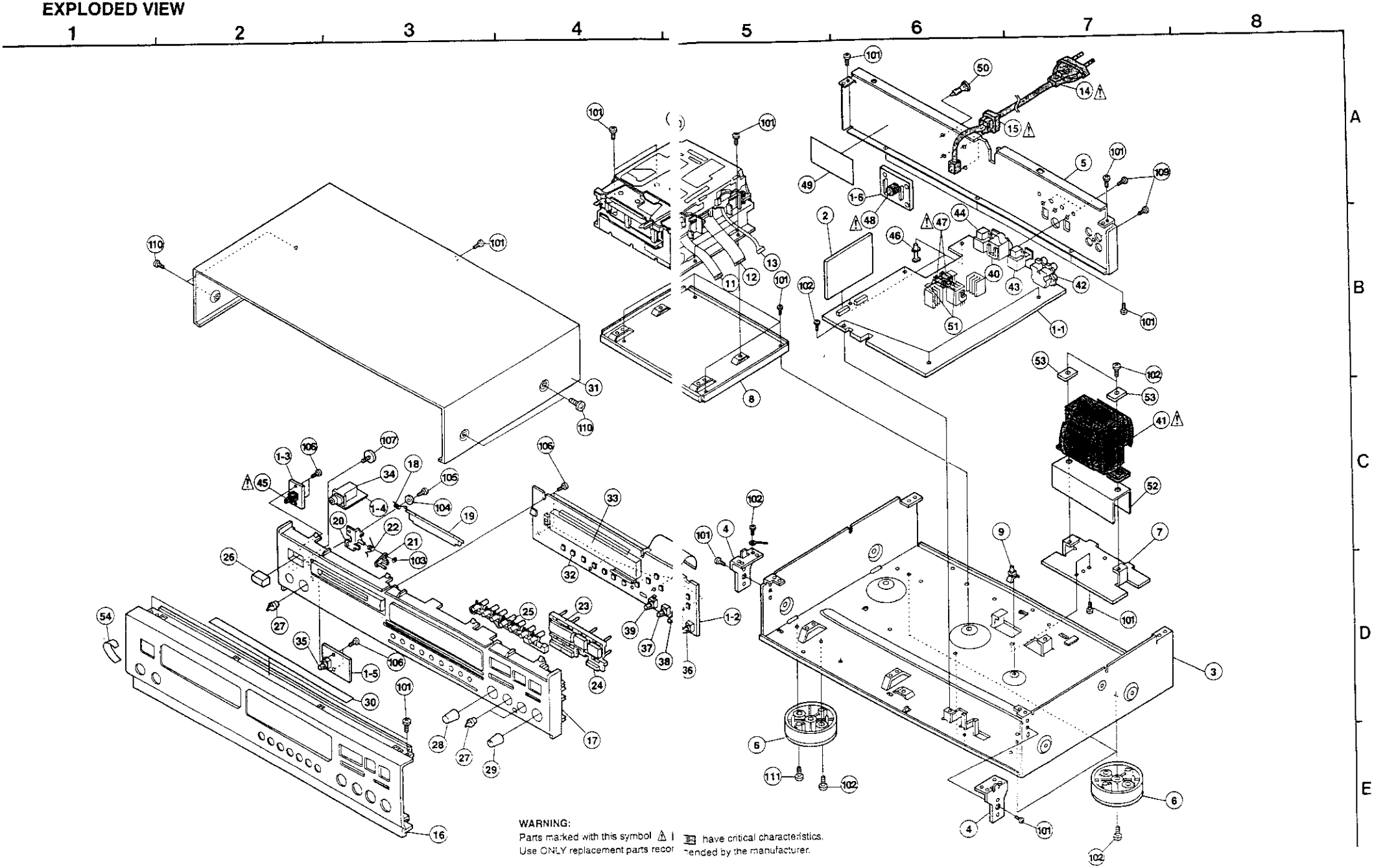
Ref. No.	Part No.	Part Name	Remarks
C164	S11 6423 211	Ceramic (Chip) 0.01μF/100V	
C166	S11 6327 511	Ceramic (Chip) 0.001μF/50V	
C167	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C168	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C169	S11 0491 311	Tantalum (Chip) 10μF/16V	
C170	S11 0491 311	Tantalum (Chip) 10μF/16V	
C171	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C175	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C176	S11 6322 711	Ceramic (Chip) 10pF/50V	
C177	S11 6322 711	Ceramic (Chip) 10pF/50V	
C178	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C181	S11 0491 311	Tantalum (Chip) 10μF/16V	
C182	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C183	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C184	S11 0783 611	Electrolytic (Chip) 22μF/8V	
[illegible]	[illegible]	[illegible]	
C186	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C191	254 4465 905	Electrolytic (Chip) 22μF/16V	
C192	S11 6303 800	Ceramic (Chip) 0.1μF/25V	
C193	S11 6434 611	Ceramic (Chip) 1μF/16V	
C194	254 4464 906	Electrolytic (Chip) 100μF/6.3V	
OTHER GROUP			
S101	S15 7246 731	Push Switch (Limit) 1key	
S102	S17 6214 811	Push Switch (2key) (REFLECT/PROTECT)	
S191	S17 6214 911	Push Switch	
S192	S17 6214 911	Push Switch	
S193	S17 6214 911	Push Switch	
CN101	S17 6650 811	FFC/FPC Connector (Z1F) 22P	
CN102	S17 6651 021	FFC/FPC Connector 30P	
CN103	S17 6650 921	FFC/FPC Connector 18P	
CN104	S17 6689 821	Connector Housing (For P.W.B) 4P	
CN191	S17 6894 411	Pin connector 6P	
CN192	S17 7001 141	Board - Board Connector (Receptacle) 4P	
CN193	S17 7001 021	Board - Board Connector (Plug) 4P	
	S16 5444 611	OWH Flexible Board	

PARTS LIST OF EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks	Q'ty
◉ 1	2U-2926K	Main Unit Ass'y		1
1-1	—	Main Unit		
1-2	—	Front Unit		
1-3	—	Power Supply Switch Unit		
1-4	—	Headphone Unit		
1-5	—	Headphone Volume Unit		
1-6	—	Power Supply Unit		
◉ 2	2U-2927	Interface Unit Ass'y		1
3	411 0962 827	Chassis		1
4	412 9324 016	Panel Bracket		2
5	105 1195 015	Rear Panel		1
6	104 0260 100	Foot Ass'y		4
7	411 1132 204	Bottom Plate		1
8	412 4108 004	Mechanical Bracket		1
9	443 0518 003	Board Holder		1
10	337 0046 005	MD Mechanism Unit MBL-2G		1
11	009 0137 022	18P FFC (0.8)		1
12	009 0137 035	30P FFC (0.8)		1
13	204 0502 016	6P CT-CT Conector Code		1
[illegible]	[illegible]	Power Supply		
[illegible]	[illegible]	Cord Pushing		
16	144 2501 111	Front Panel	Black Model	1
16	144 2501 137	Front Panel	Gold Model	1
17	146 1621 616	Inner Panel Ass'y	Black Model	1
17	146 1621 632	Inner Panel Ass'y	Gold Model	1
18	463 0825 004	Door Spring		1
19	146 1597 122	Door	Black Model	1
19	144 1597 148	Door	Gold Model	1
20	421 0721 007	D.L Bracket Ass'y		1
21	433 0624 000	Door Lever		1
22	463 0820 009	Door Lever Spring		1
23	113 1728 001	Function Knob (A)	Black Model	1
23	113 1728 014	Function Knob (A)	Gold Model	1
24	113 1776 011	Function Knob (B)	Black Model	1
24	113 1776 037	Function Knob (B)	Gold Model	1
25	113 1777 010	Series Button	Black Model	1
25	113 1777 036	Series Button	Gold Model	1
26	113 1689 043	Power Switch Button	Black Model	1
26	113 1689 014	Power Switch Button	Gold Model	1
27	112 9100 178	Knob (FUJI)	Black Model	3
27	112 9100 194	Knob (FUJI)	Gold Model	3
28	112 0779 045	Knob (Round)	Black Model	1
28	112 0779 087	Knob (Round)	Gold Model	1
29	112 0779 058	Knob (Round)	Black Model	1
29	112 0779 090	Knob (Round)	Gold Model	1
30	122 0187 113	Top Cover Spacer		1
31	102 9038 243	Top Cover	Black Model	1
31	102 9038 298	Top Cover	Gold Model	1
32	212 5604 910	Tact Switch TA	S302 - 312, 314 - 316	14
33	393 8019 005	FL Tube	FL301	1
34	204 8341 004	Headphone Jack	JK607	1

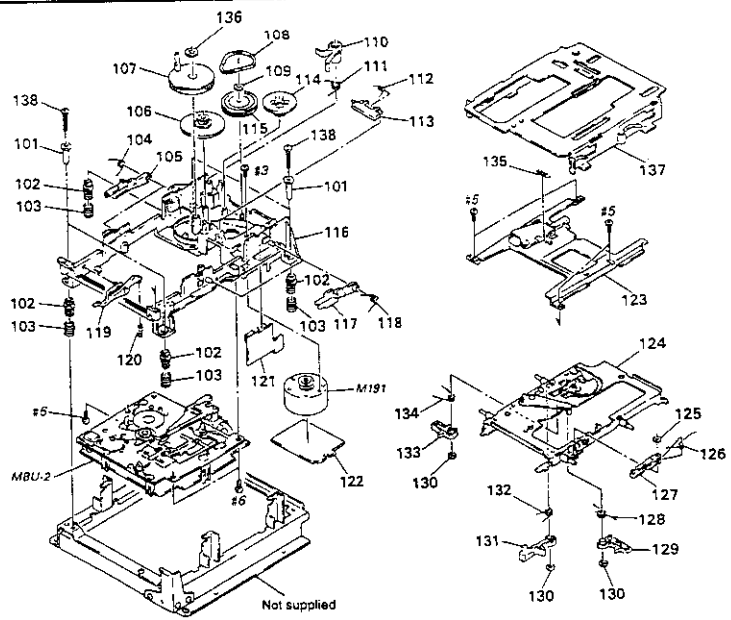
Ref. No.	Part No.	Part Name	Remarks	Q'ty
35	211 0866 004	Variable Resistor 10kohm A	VR601	1
36	211 0867 005	Variable Resistor 20kohm A	VR701	1
37	212 0351 019	Rotary Switch	S301	1
38	212 0351 019	Rotary Switch	S320	1
39	212 0376 007	Rotary Encaordar	S321	1
40	204 8178 031	1P Pin Jack	JK602	1
[illegible]	[illegible]	Power Supply Transformer	T601	
42	204 8546 008	4P RCA Pin Jack (W.SPLAT)	JK601	1
43	269 0098 006	Optical Output Terminal GP1F32T	JK605	1
44	269 0097 007	Optical Input Terminal GP1F32R	JK606	1
[illegible]	[illegible]	[illegible]		
46	412 2814 057	Card Spacer (L=12)	F603	3
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
49	513 2065 002	E2 Laser Caution		1
50	412 2741 049	Board Holder		4
51	513 0654 033	Fuse Label		2
52	412 9508 007	Bracket (TR)		1
53	WA-0120H	Washer		2
54	412 9524 007	Earth Plate		1
SCREWS (Including Washers)				
101	473 7015 018	Screw 3 x 8	3x8 CBTS (S)-B	19
102	473 7002 018	Screw 3 x 8	3x8 CBTS (S)-Z	10
103	475 1157 059	Slit Washer (T-0.5)		1
104	475 1003 006	Washer 3W		1
105	473 7505 010	Screw 2.6 x 6	2.6 x 6 CBTS (P)-Z	1
106	473 7508 017	Screw 3 x 10	3x10 CBTS (P)-B	11
107	477 0262 006	Special Screw		4
109	477 0064 107	Fixed Screw		4
110	473 7018 002	Screw 4 x 8 Black	4 x 8 CTTS (S)-B Black Model	4
110	473 4811 008	Screw 4 x 8 Nickel	4 x 8 CTTS (S)-NI Gold Model	4
111	477 0276 005	Earth Screw		1
PACKING & ACCESSORIES				
	513 9411 002	Rating Sheet	Black Model	1
	504 0092 060	Stylen Cover		1
	505 0131 076	Cabinet Cover		1
	503 9303 003	Cushion		2
	501 9296 017	Carton Case	Black Model	1
	513 9111 001	Color Label	Gold Model	2
	505 0038 030	Poly Cover		1
	511 9461 001	Operating Instruetions Manual		1
	399 0312 009	Remote Controller RC-257		1
	203 2366 004	2Pin Cord		2
	513 1389 006	Control Card		1

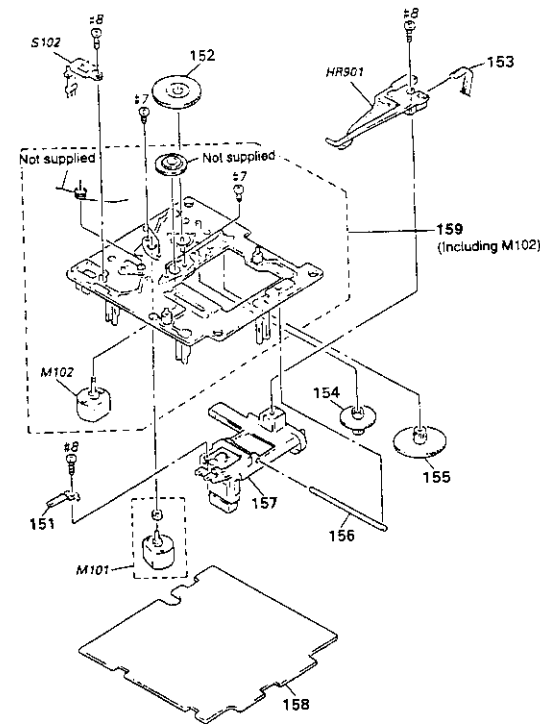
EXPLODED VIEW



WARNING:
Parts marked with this symbol ⚠ l
Use ONLY replacement parts recor
have critical characteristics.
ended by the manufacturer.

MD MECHANISM EXPLODED VIEW AND PARTS LIST





PARTS LIST OF MECHANISM UNIT

Ref. No.	Part No.	Part Name	Remarks
101	S49 6767 201	Collar	
102	S49 6767 101	Insulator (MD)	
103	S49 6767 301	Compression Spring	
104	S49 6766 801	Spring (UDL)	
105	S49 6766 701	Lever (UDL)	
106	S49 6766 501	Gear (BD-B)	
107	SX4 9450 691	Cam Ass'y	
108	S49 6765 601	Belt (BD)	
109	S49 6891 931	Washer	
110	S49 6763 701	Lever (SLM)	
111	S49 6763 801	Spring (SLM)	
112	S49 6827 301	Spring (OWH)	
113	S49 6827 201	Lever (OWH)	
114	S49 6765 401	Gear (BD-A)	
115	S49 5779 401	Gear	
116	SX4 9450 681	Base Ass'y (BD)	
117	S49 6766 901	Lever (UDR)	
118	S49 6767 001	Spring (UDR)	
119	S49 6765 701	Door Lever	
120	S49 7071 001	Compression Spring	
121	S16 5341 111	Detection SW Board	
122	S16 5341 211	Motor Board	
123	SA4 6606 47B	Installation Plate Ass'y (LVO)	
124	SX4 9463 781	Holder Ass'y	
125	S49 6891 911	Washer	

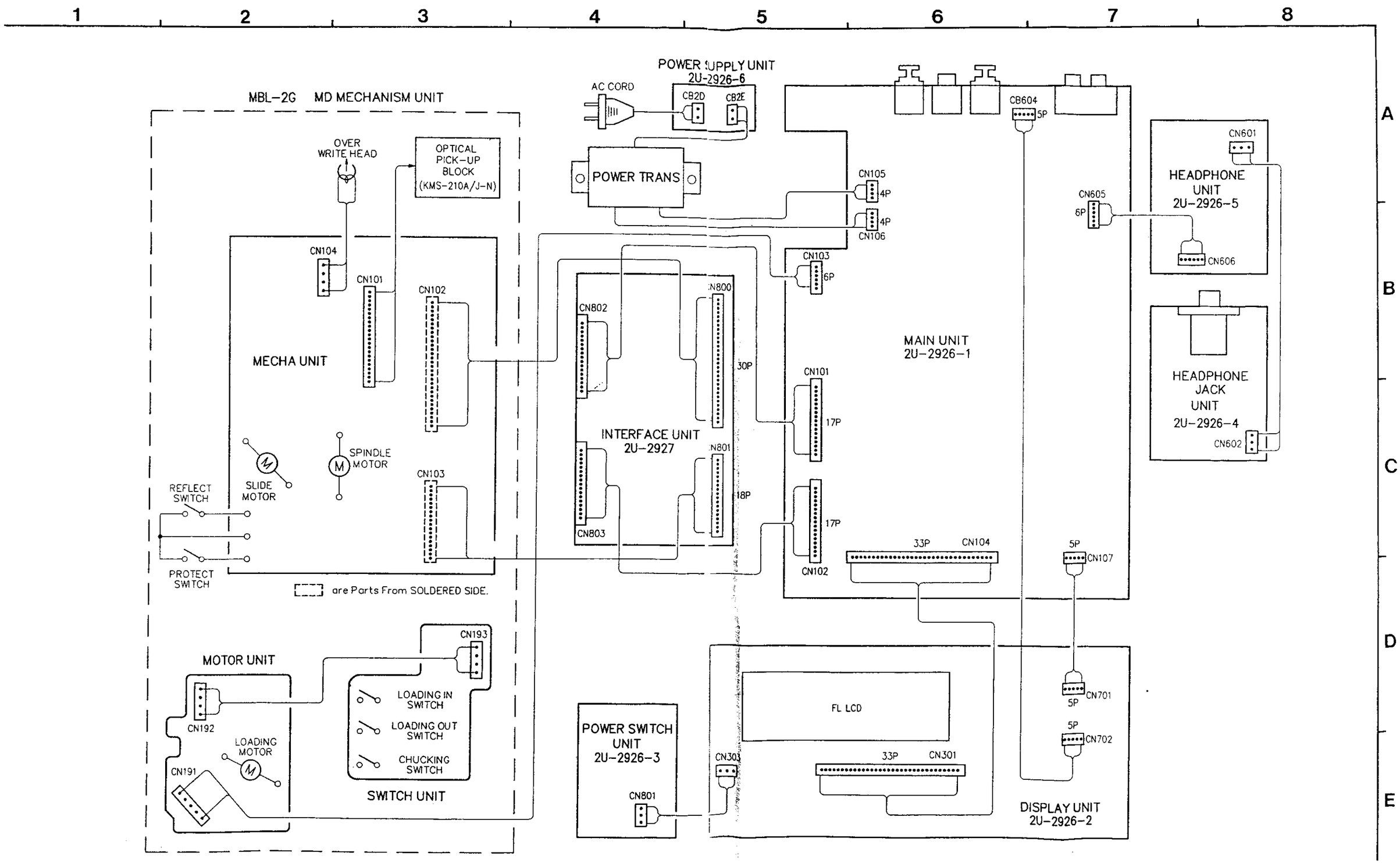
Ref. No.	Part No.	Part Name	Remarks
126	S49 6764 501	Spring (SHT)	
127	S49 6764 501	Lever (SHT)	
128	S49 7745 001	Spring (LM)	
129	S49 6763 901	Lever (LM)	
130	S49 6891 901	Washer	
131	S49 6764 101	Lever (L)	
132	S49 6764 201	Spring (L)	
133	S49 6764 201	Lever (LS)	
134	S49 6764 401	Spring (LS)	
135	S49 7174 302	Tension Spring	
136	S49 6891 921	Washer	
137	SX4 9458 721	Slide (M) Ass'y	
138	S49 9291 001	Screw +B 2.6 x 8	
M191	SA4 6606 46A	Motor (loading) Ass'y	
	SA4 6609 53B	Holder Ass'y	No. 124-134
#3	S76 2177 520	Screw +B 2.6 x 5 (EP-FE/ZNBK/CM2)	
#5	S76 8510 419	Screw +B 2 x 6 (EP-FE/ZNBK/CM2)	
#6	S76 8564 579	Screw +BVTP 3 x 6 (EP-FE/ZNBK/CM2)	
#8	S76 8587 101	Screw +BVTP 3 x 6 (EP-FE/ZN/CM2)	

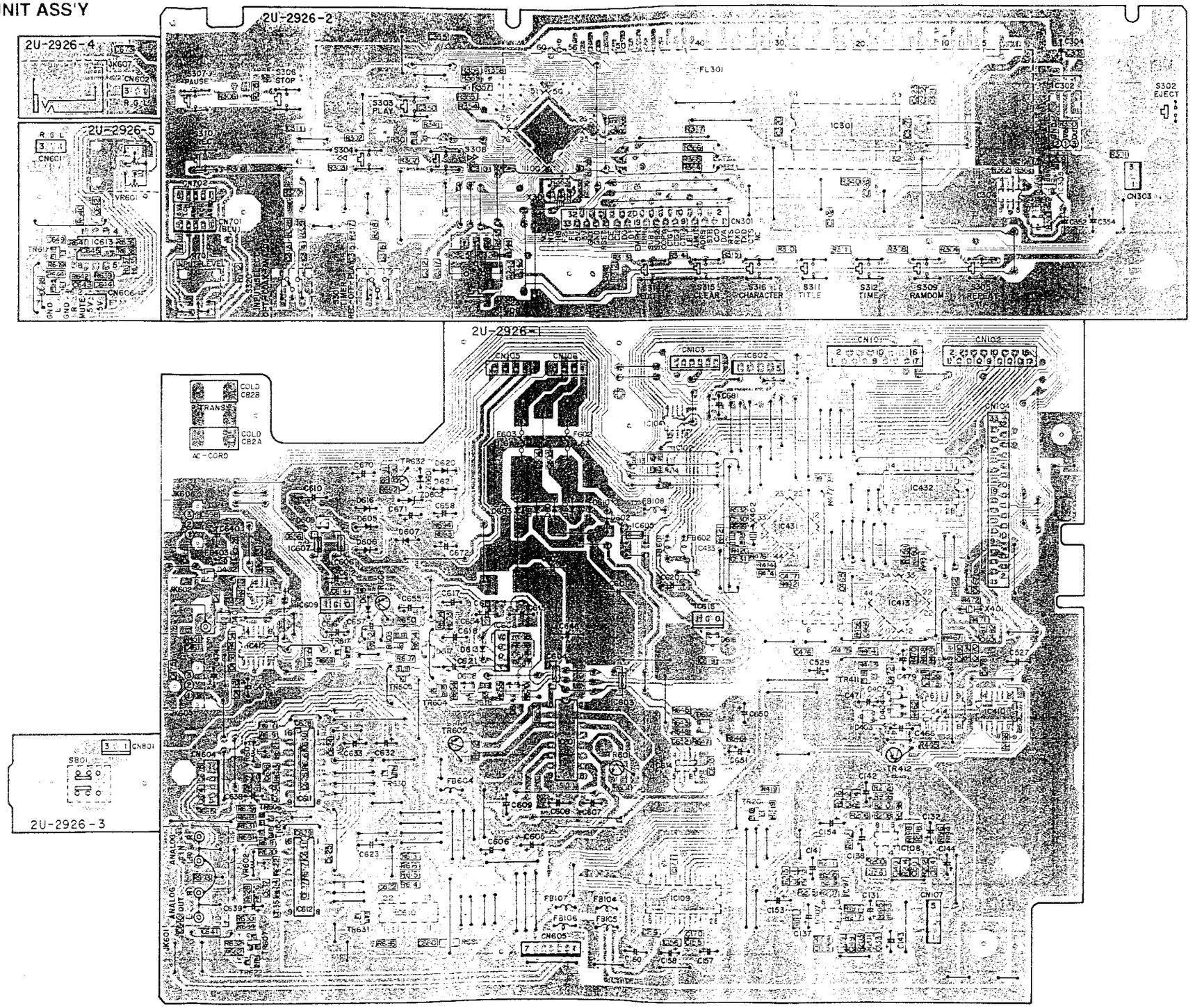
PARTS LIST OF BASE UNIT

Ref. No.	Part No.	Part Name	Remarks
151	S49 9676 901	Plate Spring	
152	S49 9676 501	Gear (SL-A)	
153	S16 5444 611	OWH Flexible Boord	
154	S49 9676 601	Gear (SL-B)	
155	S49 9676 701	Gear (SL-C)	
156	S49 9676 801	Shaft	
157	S85 8300 911	Optical Pick-up (KALS-210A/J-N)	
158	SA4 6736 56A	BD Mount (A)	

Ref. No.	Part No.	Part Name	Remarks
159	SA4 6606 50A	Chassis Ass'y (BU)	
*	SA4 6731 74A	Mount BDBoard	
HR901	S15 0017 511	Over Write Head (RF322-74A)	
M101	SA4 6606 51A	Motor Ass'y (Slide)	
S102	S17 6214 811	Push Switch (2 key) (REFLECT/PROTECT)	
#7			
#8	S76 8510 519	Screw +BVTP 2 x 8 (EP-FE/ZNBK/CM2)	

WIRING DIAGRAM





PRINTED WIRING BOARD

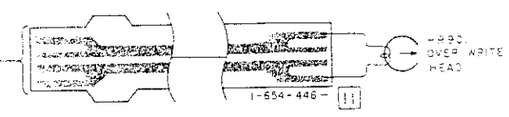
2U-2926 MAIN UNIT ASS'Y

1 2 3 4 5 6 7 8

A B C D E

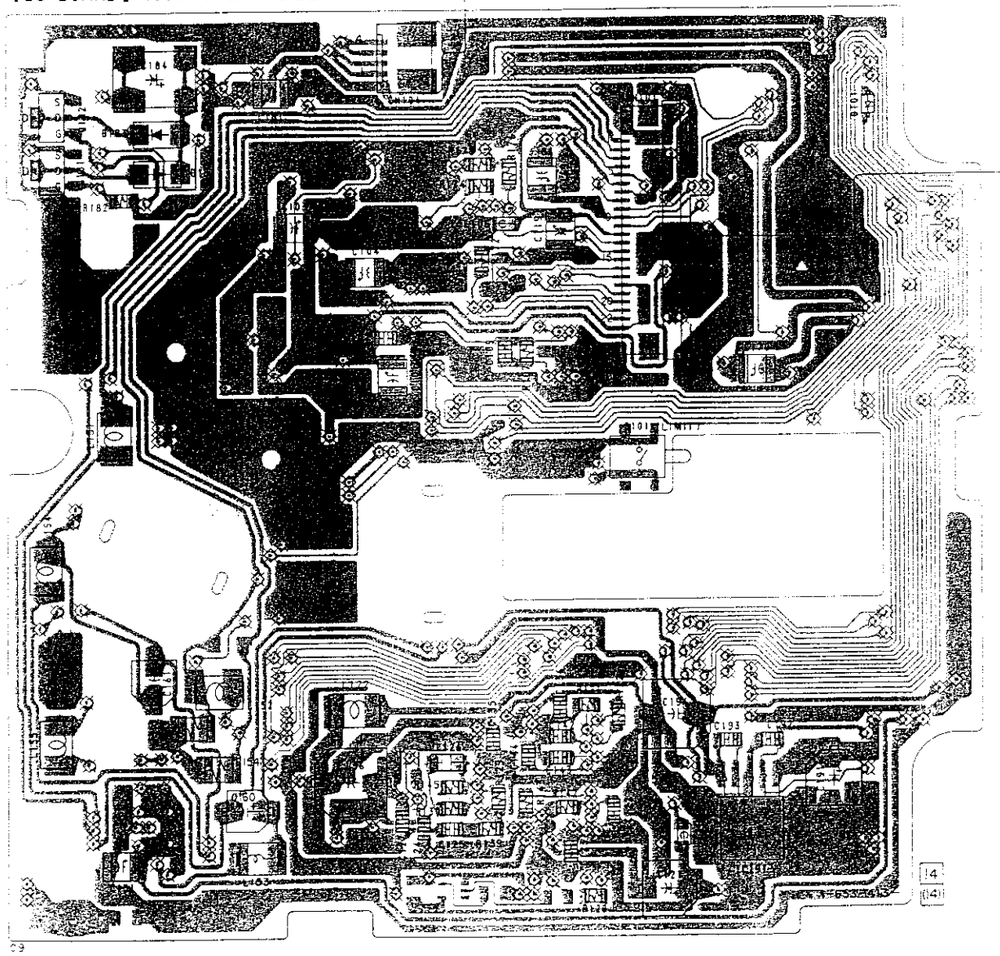
MD MECHANISM UNIT ASS'Y

【OWH FLEXIBLE BOARD】

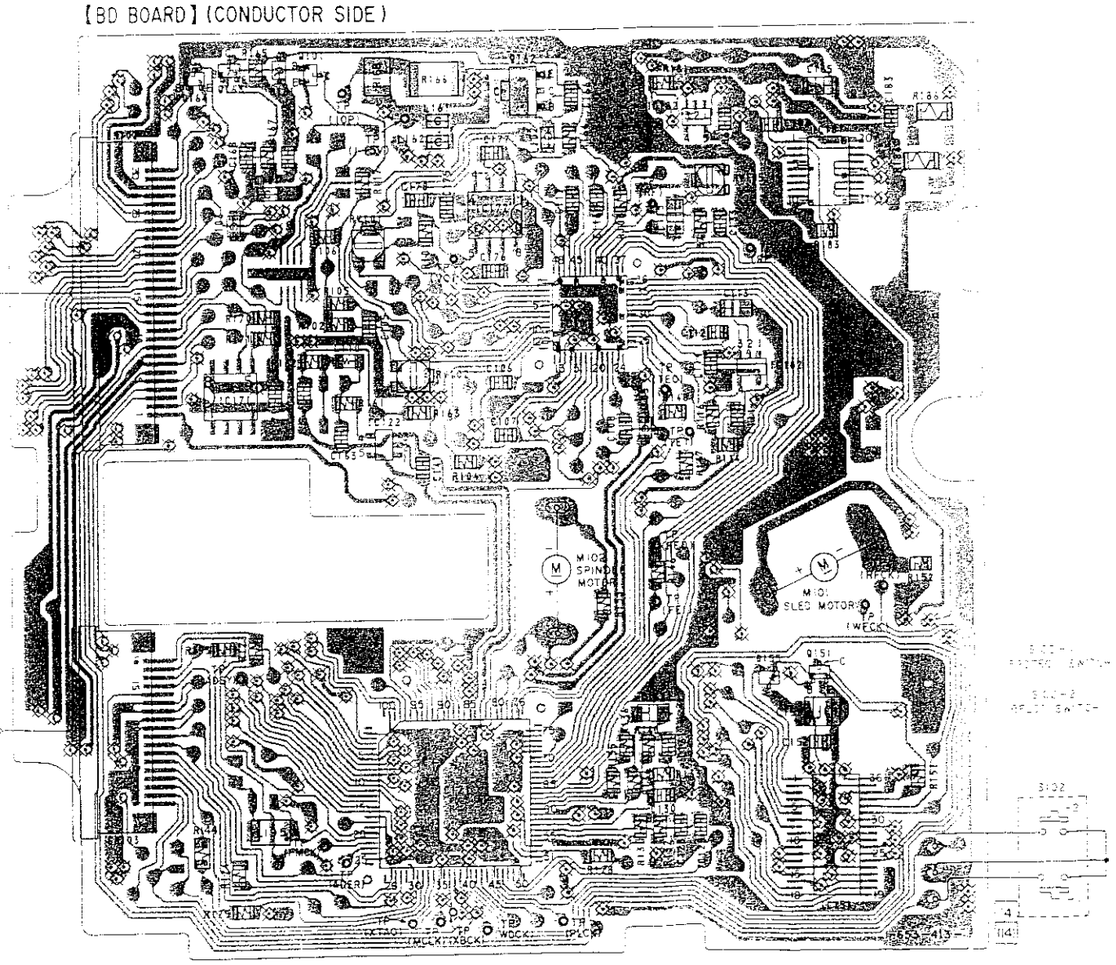


OPTICAL PICK-UP BLOCK (KMS-210A/J1N)

【BD BOARD】(COMPONENT SIDE)



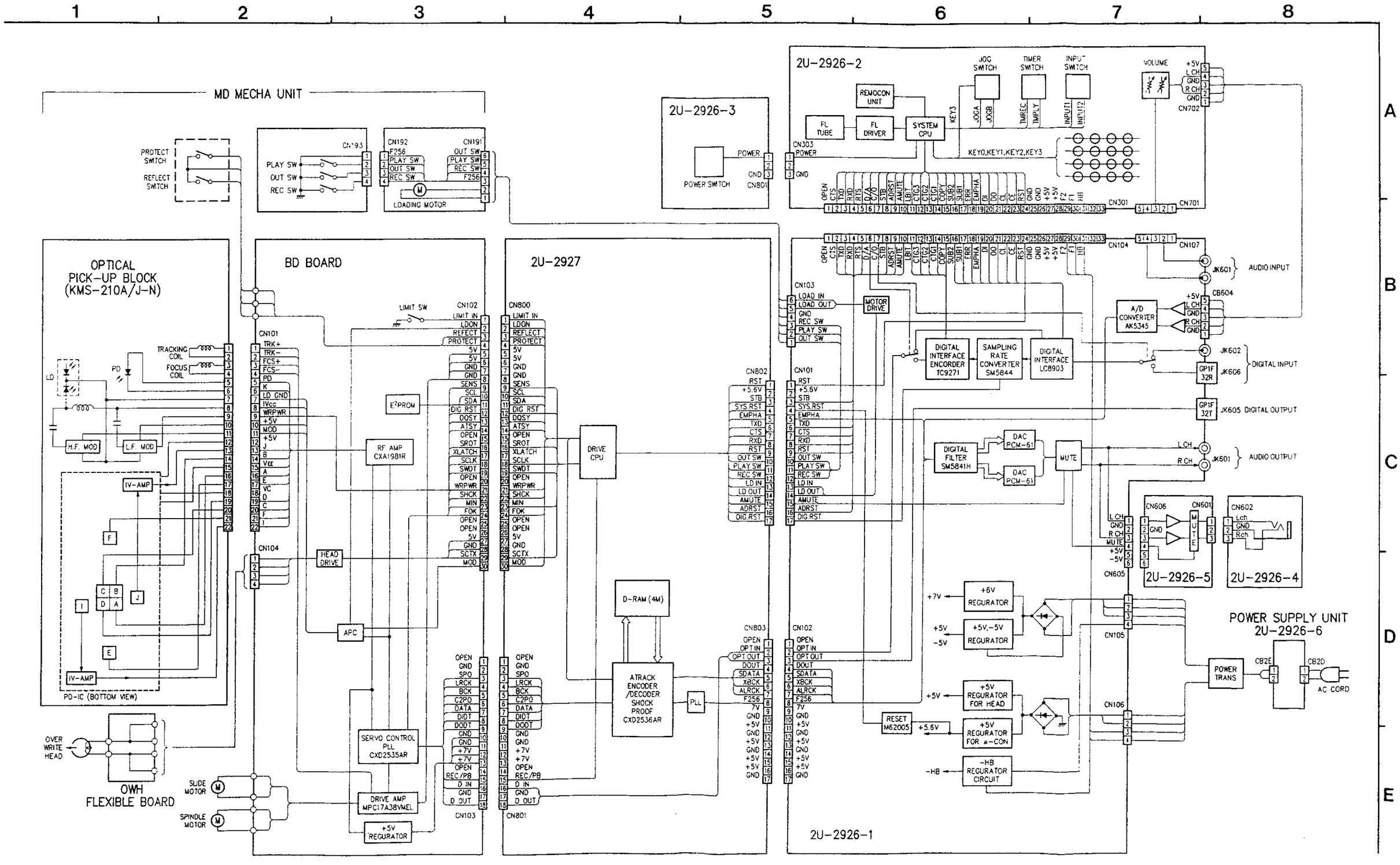
【BD BOARD】(CONDUCTOR SIDE)

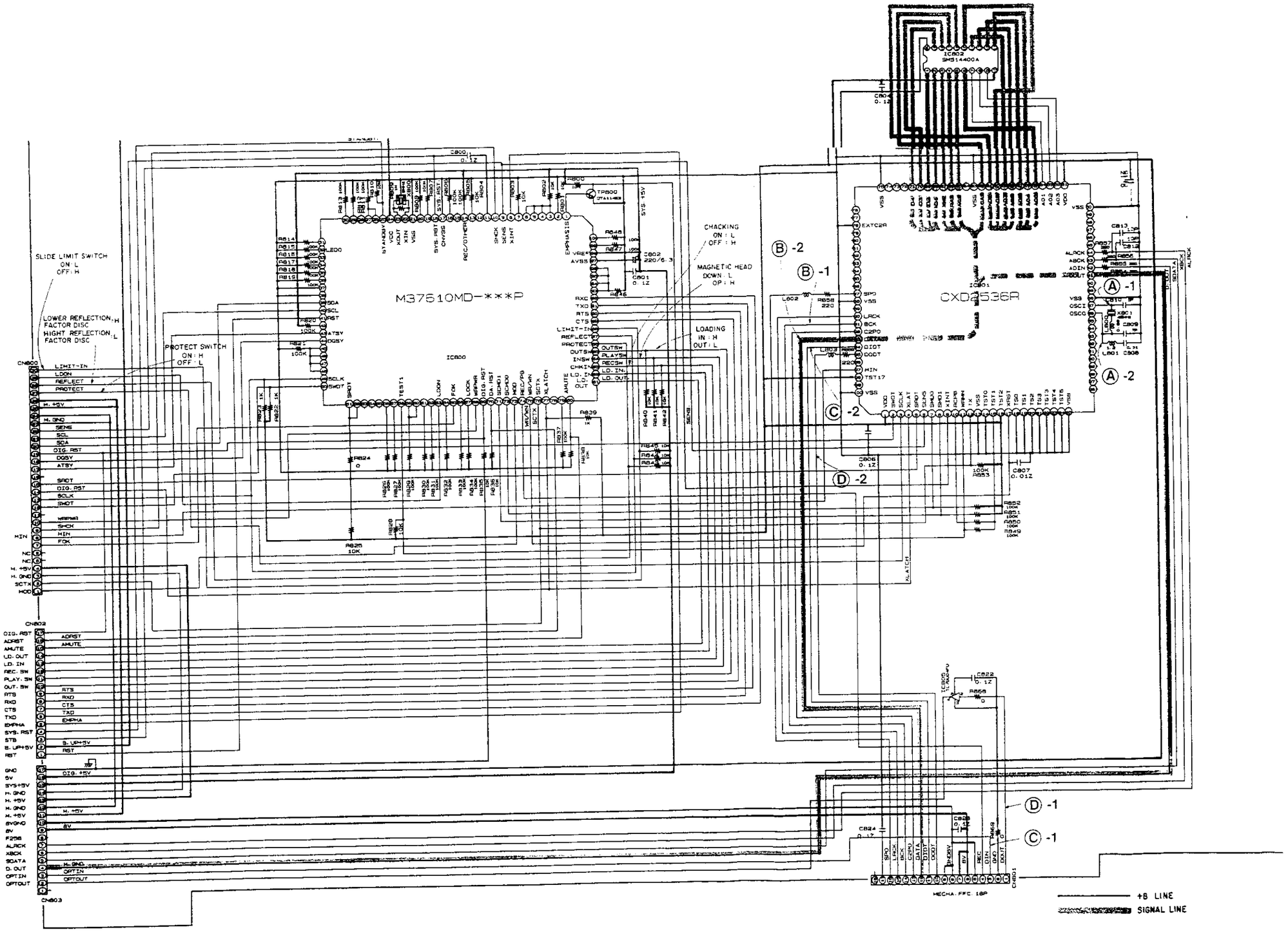


A

To DIGITAL BOARD
CN102→CN103
CN103→CN102

BLOCK DIAGRAM

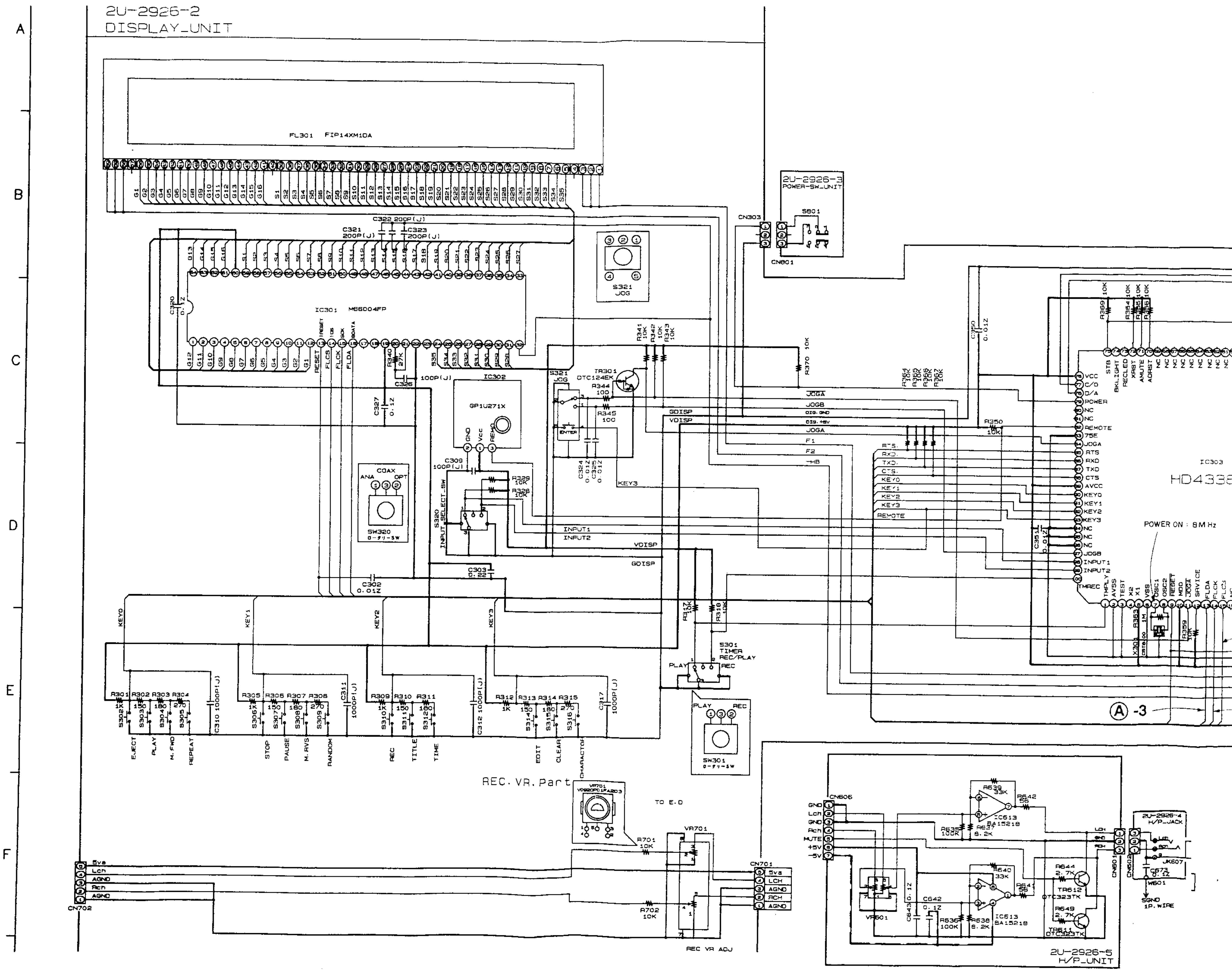




NOTES

WARNING:
Parts marked with this symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a



2U-2926-2
DISPLAY_UNIT
FL301 FIP14XM1DA
IC301 M66004FP
IC302
GP1U271X
2U-2926-3
POWER-SW-UNIT
S801
CN303
CN801
S321
JOG
TR301
DTC124EK
COAX
ANA
OPT
SW320
INPUT SELECT SW
INPUT1
INPUT2
VDISP
GDISP
JOGA
JOGB
KEY0
KEY1
KEY2
KEY3
REMOTE
IC303
HD4338
POWER ON : 8MHz
S301
TIMER
REC/PLAY
PLAY
REC
SW301
EJECT
PLAY
M.FWD
REPEAT
STOP
PAUSE
M.RVS
RANDOM
REC
TITLE
TIME
EDIT
CLEAR
CHARACTOR
REC. VR. Part
VR701
TO E-D
REC VR ADJ
CN701
CN702
5Va
Lch
AGND
Rch
AGND
CN606
GND
Lch
GND
Rch
MUTE
+5V
-5V
IC613
BA15218
TR612
DTC323TK
TR611
DTC323TK
VR601
CN601
CN502
2U-2926-4
H/P_JACK
JK607
SGND
1P. WIRE
2U-2926-5
H/P_UNIT
Ⓐ-3

2U-2926-2 DISPLAY UNIT

FL301 FIP14XM10A

2U-2926-3
POWER-SW_UNIT

CN303 CN801 S801

S321 JOG

IC301 M66004FP

IC302 GP1U271X

IC303 HD433836

IC305 MN13825(TX)

IC304 TC7WG04F

TR301 DTC124EK

S320 INPUT SELECT_SW

SW320 ロータリースイッチ

S301 TIMER REC/PLAY

SW301 ロータリースイッチ

CN606 CN801 CN802 CN701 CN301

IC613 BA15218

TR611 DTC323TK TR612 DTC323TK

2U-2926-4 H/P_JACK

2U-2926-5 H/P_UNIT

POWER ON : 8MHz

REC. VR. Part

TO E.D

REC VR ADJ

A -3

+B LINE

-B LINE

OWH
FLEXIBLE BOARD

OPTICAL
PICK-UP BLOCK
(KMS-210A/J-N)

IC182
INVERTER

IC172
BUFFER

IC101
RF AMP

IC102
INVERTER

IC122
INVERTER

IC151
SLED/SPINDLE MOTOR DRIVE
FOCUS/TRACKING COIL DRIVE

IC121
DIGITAL SIGNAL PROCESSOR
DIGITAL SERVO SIGNAL PROCESSOR
EFM/ACIRC ENCODER/DECODER

IC171
MEMORY

IC191
+5V REG.

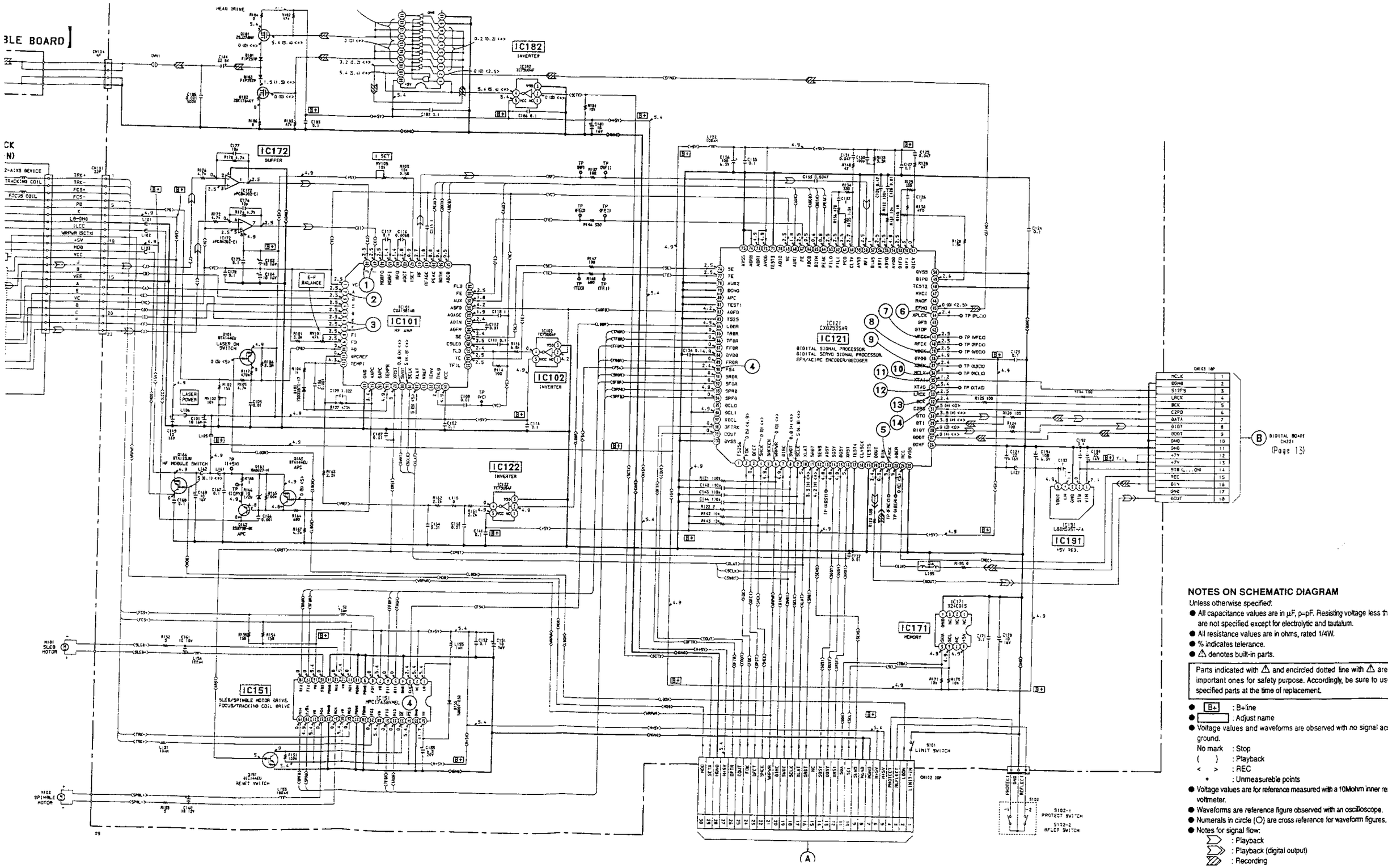
M101
SLED
MOTOR

M102
SPINDLE
MOTOR

S101
LIMIT SWITCH

S102-1
PROTECT SWITCH

S102-2
REJECT SWITCH



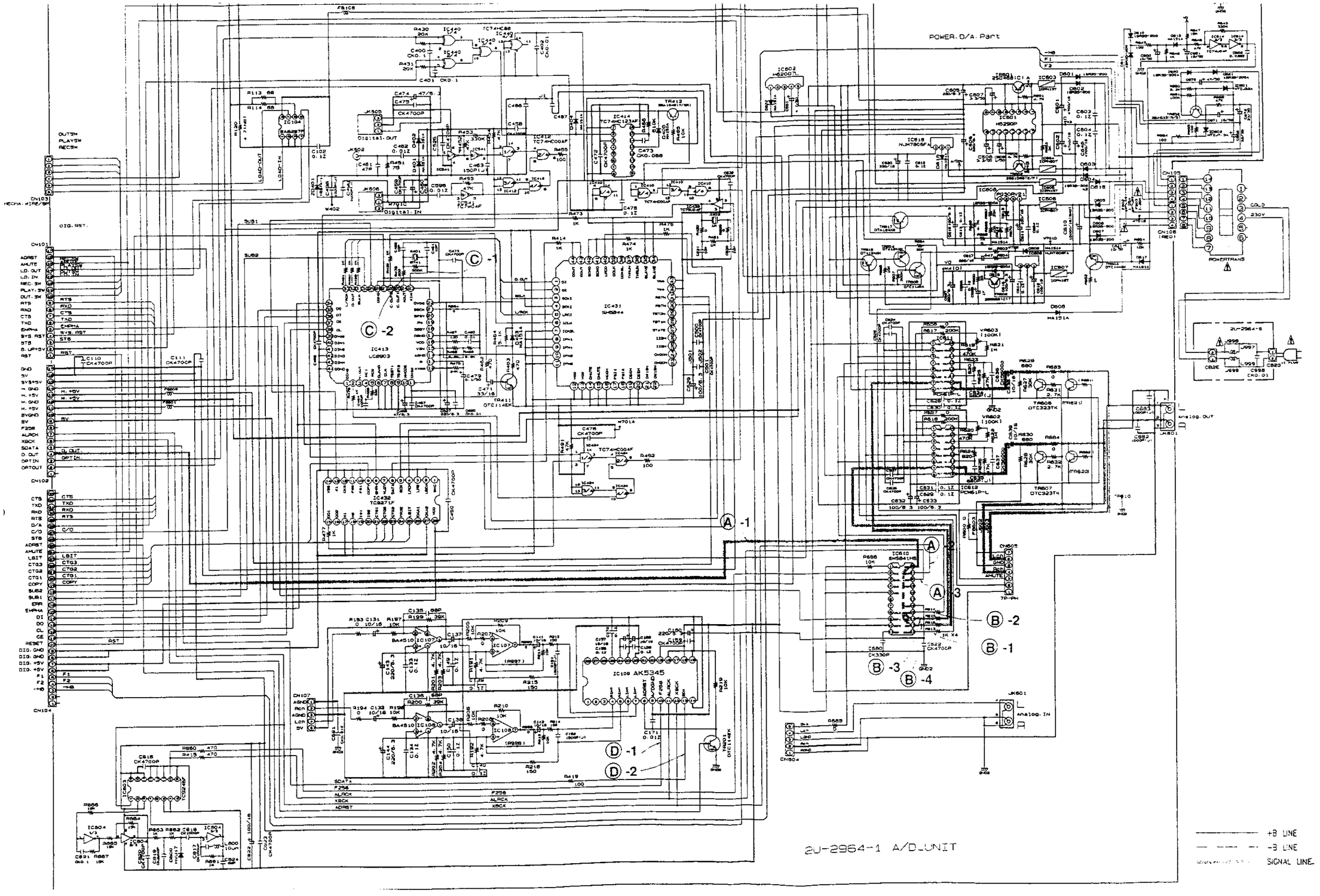
NOTES ON SCHEMATIC DIAGRAM

Unless otherwise specified:

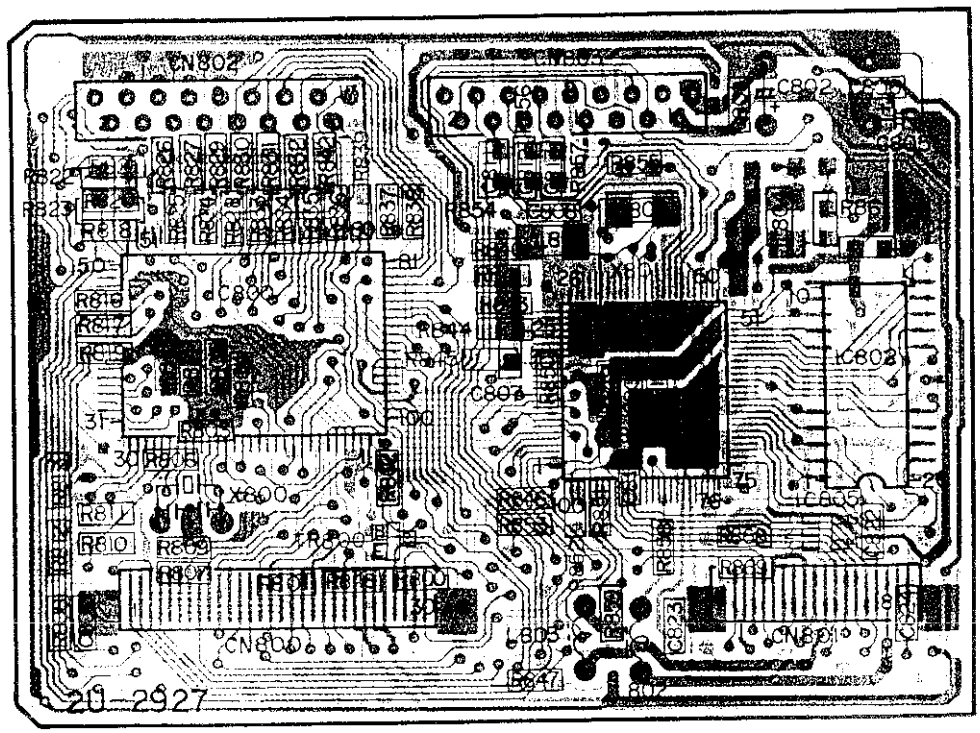
- All capacitance values are in μF, p=pF. Resisting voltage less than 50V are not specified except for electrolytic and tautalum.
- All resistance values are in ohms, rated 1/4W.
- % indicates tolerance.
- ⚠ denotes built-in parts.

Parts indicated with ⚠ and encircled dotted line with ⚠ are very important ones for safety purpose. Accordingly, be sure to use the specified parts at the time of replacement.

- B+ : B+line
- [ ] : Adjust name
- Voltage values and waveforms are observed with no signal across the ground.
  - No mark : Stop
  - ( ) : Playback
  - < > : REC
  - * : Unmeasureble points
- Voltage values are for reference measured with a 10Mohm inner resistance voltmeter.
- Waveforms are reference figure observed with an oscilloscope.
- Numerals in circle (O) are cross reference for waveform figures.
- Notes for signal flow:
  - : Playback
  - : Playback (digital output)
  - : Recording


POWER, D/A Part
2U-2964-1 A/D UNIT
+B LINE
-B LINE
SIGNAL LINE

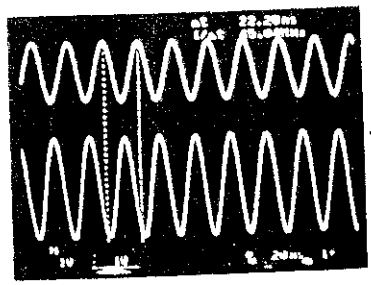
2U-2927 INTERFACE UNIT ASS'Y



2U-2927 WAVEFORM

Ⓐ -1

Ⓐ -2

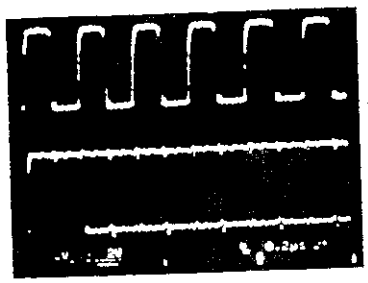


CH1: IC801 (37) OSCI
(45.1584MHz, Input signal of X'tal osc.)
1V/20nsec/div

CH2: IC802-(36) OSCO
(45.1584MHz, Output signal of X'tal osc.)
1V/20nsec/div

Ⓑ -1

Ⓑ -2



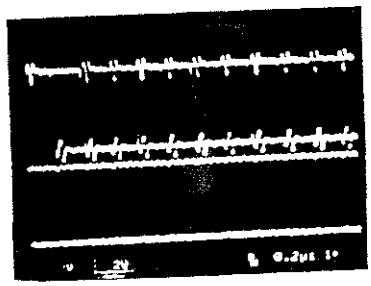
CH1: IC801-(41) BCK
(2.8224MHz, Bit clock signal)
2V/0.2μsec/div

CH2: IC801-(43) DATA (DATA signal)
2V/0.2μsec/div

Note: PLAY mode

Ⓒ -1

Ⓒ -2



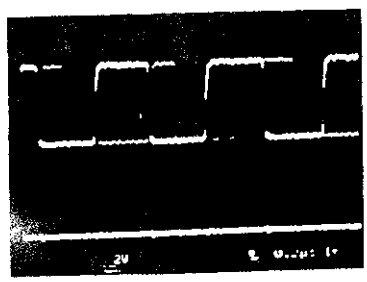
CH1: IC801-(3) DIN
(Digital Audio input signal)
2V/0.2μsec/div

CH2: IC801-(34) DOUT
(Digital Audio output signal of [uPD
2V/0.2μsec/div

Note: REC Pause mode

Ⓓ -1

Ⓓ -2



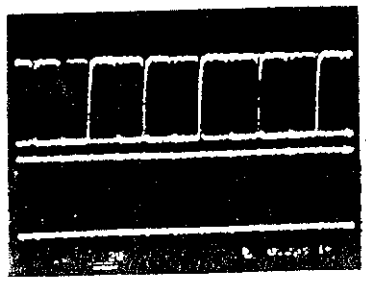
CH1: IC801-(1) DOUT
(Digital Audio output signal)
2V/0.2μsec/div

CH2: IC801-(95) DODT
(16bit Data signal)

Note: PLAY Pause mode

Ⓓ -1

Ⓓ -2



CH1: IC801-(1) DOUT
(Digital Audio output signal)
2V/0.2μsec/div

CH2: IC801-(95) DODT
(16bit Data signal)

Note: PLAY, REC mode