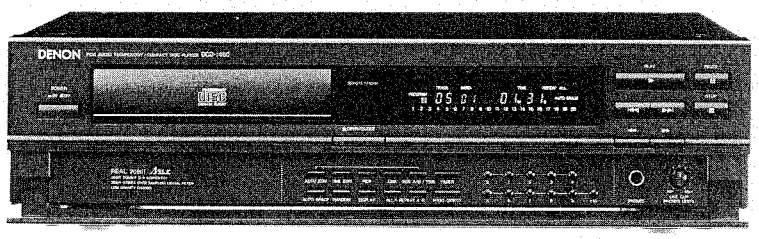
DENON

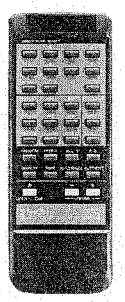
Hi-Fi Component

SERVICE MANUAL

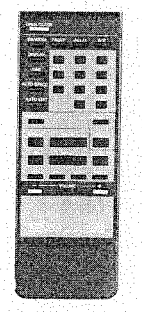
STEREO CD PLAYER

MODEL DCD-1460





RC221
for U.S.A., Canada and Australia models



RC225
for Europe and U.K. models

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NIPPON COLUMBIA CO., LTD.

IMPORTANT TO SAFETY

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:

1. **Handle the power supply cord carefully**
   Do not damage or deform the power supply cord. If it is damaged or deformed, it may cause electric shock or malfunction when used. When removing from wall outlet, be sure to remove by holding the plug attachment and not by pulling the cord.
2. **Do not open the top cover**
   In order to prevent electric shock, do not open the top cover. If problems occur, contact your DENON DEALER.
3. **Do not place anything inside**
   Do not place metal objects or spill liquid inside the CD player. Electric shock or malfunction may result.

Please, record and retain the Model name and serial number of your set shown on the rating label.
Model No. DCD-1460 Serial No. _____

IMPORTANT
(BRITISH MODEL ONLY)

The wires in this mains lead are coloured in accordance with the following code:

Blue:	Neutral
Brown:	Live

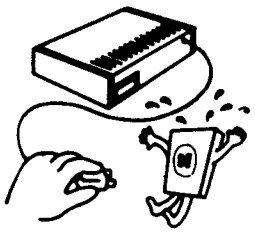
The colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

NOTE: This CD player uses the semiconductor laser. To allow you to enjoy music at a stable operation, it is recommended to use this in a room of 5°C (41°F) – 35°C (95°F).

SAFETY INSTRUCTIONS FOR AUDIO SET

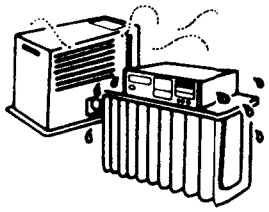
■ INSTALLATION

1. Operate the set only from a power source which is indicated on the rating label (indication) at the back of the set.
2. Frayed cords and broken plugs may cause a fire or shock hazard. Do not damage the power cord.
   - Do not cut and splice the power cord.
   - When removing the power cord from wall outlet, be sure to unplug by holding the plug attachment and not by pulling the cord. Do not hold the plug with wet hands.
   - Call your service technician for replacement of damaged cords and plugs.
3. Select a place so that the location or position does not interfere with the proper ventilation of the set for releasing heat generated during operation.
   - Select a flat and level surface allowing enough space for setting up and operation.
   - Never block the bottom ventilation holes placing the set on a bed, sofa, rug, etc.
   - Never place the set in a "built-in" enclosure unless proper ventilation is provided.
   - Never place the set near or over a radiator, heat register or stove.
   - Avoid locations where the set is exposed directly to the sun light.


Check voltage.

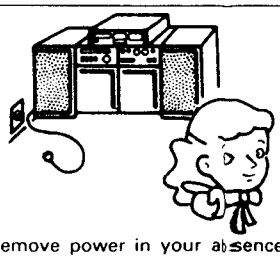

Do not pinch power cord.


Do not splice power cord.


Avoid heat.

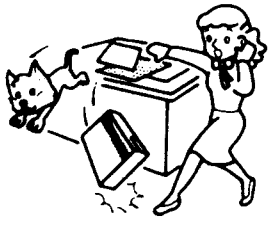
■ USE

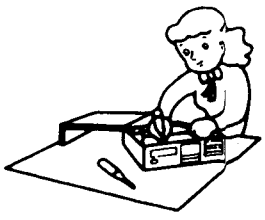
1. Do not expose the set to rain or water (liquid). Do not spill liquid or insert metal objects inside the set. Rain, water or liquid such as cosmetics as well as metal my cause electric shorts which can result in fire or shock hazard. If anything gets inside, unplug the power cord and have a DENON service technical check your set before further use.
2. Never leave your set switched on when leaving the house. For added protection of your audio system during lightning storm or when the set is to be left unused for a long period of time, be sure to unplug the power cord from the wall outlet.
3. Take care so that the set is not dropped to avoid damaging the cabinet which defeats safeguards or injuring yourself. If the set has been dropped or the cabinet has been damaged, unplug the set and have it checked by a DENON service technician to restore the safeguards.


Remove power in your absence.

■ SERVICING

1. The servicing of the set must not be attempted by yourself beyond that described in the operating instructions. In case of problems that cannot be settled by referring to your operating instructions, unplug the power cord and contact your DENON dealer. No user-serviceable parts are inside the set. Only qualified service technician can service inside your set.
2. Refer to the operating instructions for maintenance and cleaning.


Do not drop.


No user-serviceable parts inside.

Thank you for purchasing this DENON Compact Disc Player. Please read the operating instructions thoroughly in order to acquaint yourself with the CD player and achieve maximum satisfaction from it.

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Please check to make sure the following items are included with the main unit in the carton:

(1) Operating Instructions 1
(2) Connection Cord 1
(3) Remote Control Unit 1
(4) Dry Cell Battery 2

FEATURES

The DCD-1460 is a CD player which uses DENON's unique ΛS.L.C. (Super Linear Converter) for eliminating loss of sound quality in the PCM playback section to offer playback of the same sounds as those in the studio or hall where the CD was recorded. In addition, the use of carefully selected parts makes this a high performance CD player reproducing the original sound field with rich musical expression.

(1) Real 20-bit ΛS.L.C. (Super Linear Converter)
The use of DENON's unique system for preventing zero cross distortion, the main factor in loss of sound quality in the PCM playback section, plus real 20-bit D/A converters with superior resolution, offers reproduction of the original sound field with rich musical expression.

(2) High performance digital filter
The independent real 20-bit D/A converters for the left and right channels and a high precision digital filter with 8 times oversampling bring out the best of the analog filter to produce crisp, clear sound.

(3) Remote control unit with volume control
In addition to such functions as play, pause, stop and direct search using number buttons, the remote control unit also includes + and – volume buttons for remote control of the volume. The remote control functions greatly add to the operability of the set.

(4) Optical digital output
This jack makes it possible to output the data on the compact disc in its digital form to a digital processor or D/A unit for playback. The optical output eliminates noise interference and improves sound quality.

(5) Playback of 8-centimeter CD singles
8-centimeter CD singles can be played on the DCD-1460 without an adapter.

VAROITUS: **SUOJAKOTELOA EI SAA AVATA. LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ SILMILLE VAARALLISTA LASERSÄTEILYÄ.**

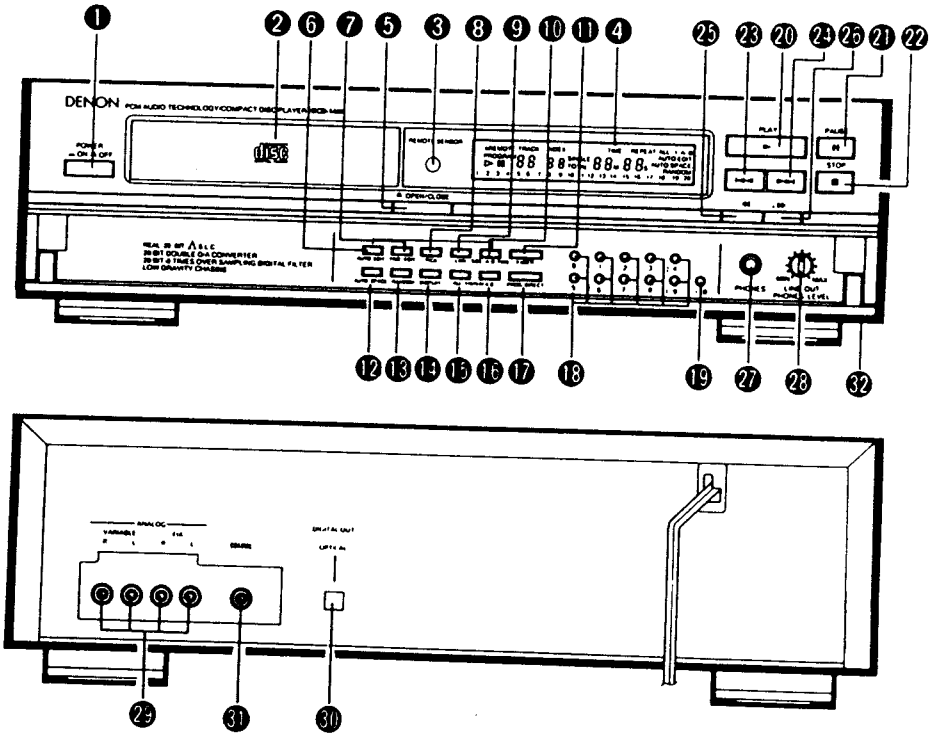
ADVARSEL: **USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.**

VARNING: **OSYNLIG LASERSTRÅLNING VID AVLÄGSNANDE AV APPARATENS HÖLJE. UNDVIK EXPONERING AV LASERSTRÅLNING.**

"CLASS 1 LASER PRODUCT"

IMPORTANT
(CANADIAN MODEL ONLY)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus setout in the Radio Interference Regulations of the Canadian Department of Communication.



❶ Power Switch (POWER)

- When the power is turned on, "00" appears at the track number display, and if no disc is loaded, "00:00" appears on the number display and the calendar lights.
- If a disc is loaded when the power is turned on, in several seconds the total number of tracks on the disc appears at the track number display, the total time appears at the time display, and the numbers on the calendar display light up to the total number of tracks on the disc, then playback starts.

❷ Disc Holder

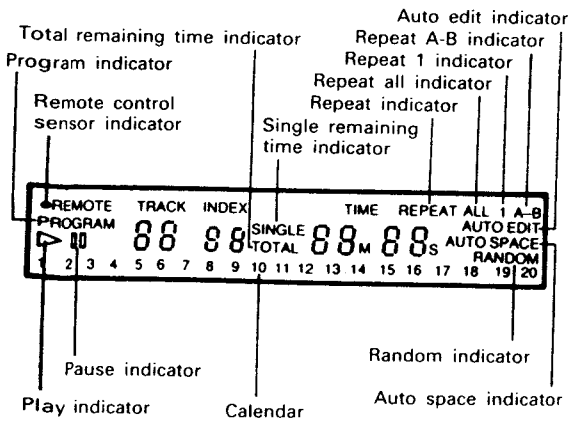
- This is where the disc is loaded.
- Press the disc holder open/close button ❺ (⏏ OPEN/CLOSE) to open and close the disc holder.
- The disc holder is also closed if the play button ⓴ (▶ PLAY), pause button ㉑ (⏸ PAUSE), or one of the number buttons ⓲ is pressed.

❸ Remote Control Sensor

- This is the sensor for the wireless remote control signals.
- Point the wireless remote control unit at this sensor when operating it.
- The remote control sensor indicator on the display window ❹ lights when the remote control unit is operated.

❹ Display Window

- The display window indicates the track number, index number, playing time, calendar, etc.



❺ Disc Holder Open/Close Button (⏏ OPEN/CLOSE)

- Press this to open and close the disc holder ❷.
- When pressed, the disc holder ❷ opens. When pressed again, the disc holder ❷ closes.
- If a disc is loaded, the total number of tracks on the disc and the total playing time appear on the display window ❹ several seconds after the disc holder ❷ is closed.

❻ Auto Edit Button (AUTO EDIT)

- The auto edit function automatically divides the tracks on the compact disc (which is recorded on one side) into sides A and B as on a record (analog disc), with the division at the beginning of a track in such as way that the disc's total playing time is divided as close as possible by one half.

❼ Time Edit Button (TIME EDIT)

- Press this button to edit in conjunction with the tape time. (Refer to Page 10).

❽ Pick Button (PICK)

- Press this button when substituting a track with the time edit. (Refer to Page 11).

❾ Link Button (LINK)

- Press this button when editing spans a number of discs. (Refer to Page 12).

❿ Side A/B and Time Mode Button (SIDE A/B TIME)

- Press this button to switch between the display of side A and side B of the tape. (Only when stopped.)
- Use this button to switch the time display between the elapsed time for the track being played, the remaining time for the track being played, and the total remaining time. (During play or when stopped.)

  Normally the elapsed time for the track being played is displayed. If the button is pressed once, the [SINGLE] indicator lights and the display changes to the remaining time for the track being played. If pressed again, the [SINGLE] indicator turns off, the [TOTAL] indicator lights, and the total remaining time is displayed. If pressed once again, the [TOTAL] indicator turns off and the display returns to the elapsed time for the track being played.

  During program playback, the total remaining time for all programmed tracks is displayed when the [TOTAL] indicator is lit.

⓫ Fader Button (FADER)
- Press to perform fade out or fade in. (Refer to Page 12).

⓬ Auto Space Button (AUTO SPACE)
- When pressed, the [AUTO SPACE] indicator lights and a blank space of approximately 4 seconds is inserted between tracks. When pressed while the [AUTO SPACE] indicator is lit, the [AUTO SPACE] indicator turns off and the auto space function is cancelled.
- The auto space function will not work if one of the automatic search buttons (⏮ or ⏭) is pressed.
- The auto space function will work during both program playback and normal playback.
- When using the auto space function, the time of 4 seconds between tracks will not be added to the remaining time display or the time display during the auto edit mode.

⓭ Random Play Button (RANDOM)
- Press this button to play the tracks on the disc in random order.

⓮ Display Button (DISPLAY)
- Press this button to change the brightness of the display.
- Press once to make the display 2/3 as bright as normal.
- Press again to make the display 1/3 as bright as normal.
- Press once again to turn the entire display off during playback and all but the track number off in any other mode.

⓯ Repeat Button (ALL/1)
- Press this button to repeat playback.
  When pressed, the [REPEAT] and [ALL] indicators light, and all tracks are repeated.
  When pressed again, the [REPEAT] and [1] indicators light (the [ALL] indicator turns off) and only the current track is repeated.
  When pressed once more, the [REPEAT] and [1] indicators turn off and the repeat mode is cancelled. During program playback, [ALL] programmed tracks are repeated.

⓰ A-B Repeat Button (A-B)
- Press this button to repeat playback between two points. (Refer to Page 9).

⓱ Program/Direct Button (PROGRAM/DIRECT)
- Press this button to switch between the program memory and direct search. (Refer to Page 8.)

⓲ Number Buttons (0, 1, 2, 3, 4, 5, 6, 7, 8 and 9)
- Use these buttons for direct search and program memory operations.
  For direct search for example, press the [3] button to start playback from the beginning of the third track. To start playback from the beginning of the 12th track, press [+10] and [2]. To program tracks, press the program/direct button ⓱ to set the program mode.

⓳ +10 Button (+10)
- Press this button to search for track numbers over track 10. Use this button together with the number buttons ⓲. For example, press [+10] and [5] to search for the 15th track. In the same way, to search for the 20th track, press the [+10] button twice, then press the [0] button.

⓴ Play Button (▶ PLAY)
- Press this button to play the disc.
  When pressed, the [▶] indicator lights, and the number of the track being played, the index number, and the elapsed time for that track appear on the display.
  The calendar indicates the tracks on the disc. The numbers for the tracks turn off as the tracks are played.
- Once the last track is played, the [▶] indicator turns off and the unit is set to the stop mode.
- When the play button is pressed after setting a disc in the disc holder, the disc holder closes and playback begins.

㉑ Pause Button (⏸ PAUSE)
- Press this button to interrupt playback momentarily.
- When pressed during playback, playback stops, the [▶] indicator turns off, and the [⏸] indicator lights.
- To cancel the pause mode, either press the play button ⓴ or press the pause button ㉑ again.

㉒ Stop Button (■ STOP)
- Press this button to stop playback.
- The disc stops turning, and the total number of tracks is displayed at the track number display, the total playing time at the time display.
- If a program is set, the total number of tracks programmed and the total program playing time are displayed.

㉓ Automatic Search Reverse Button (⏮)
- Press this button to move the pickup backwards to the beginning of a previous track.
- During the play or pause modes, the pickup is moved backwards by a number of tracks equivalent to the number of times this button is pressed.

㉔ Automatic Search Forward Button (⏭)
- Press this button to move the pickup forwards to the beginning of a following track.
- During the play or pause modes, the pickup is moved forwards by a number of tracks equivalent to the number of times this button is pressed.

㉕ Manual Search Reverse Button (◀◀)
- Press this button to reverse playback.
- When pressed during the play mode, the sound is heard and the disc is reversed while the button is pressed.
- When pressed during the pause mode, the disc is reversed at approximately 3 times the speed as when during the play mode, and no sound is heard.

㉖ Manual Search Forward Button (▶▶)
- Press this button to forward playback.
- When pressed during the play mode, the sound is heard and the disc is forwarded while the button is pressed.
- When pressed during the pause mode, the disc is forwarded at approximately 3 times the speed as when during the play mode, and no sound is heard.

㉗ Headphones Jack (PHONES)
- Use this jack to plug in headphones. (Headphones are sold separately.)

㉘ Volume Adjust Control (LINE OUT)
- Use this to adjust the output level (volume) of the headphones or the line out (VARIABLE) output level.
- This operation is also possible using the included remote control unit (RC-221). (Refer to Page 14.)

㉙ Output Jacks (FIX and VARIABLE)
- Connect these to the amplifier's input jacks. (Refer to Page 6.)

㉚ Digital Output Jack (OPTICAL)
- Digital data is output in optical form from this jack.
- Contact your nearest Denon Consumer Center or office for information on the optical fiber cable to be used for connection.

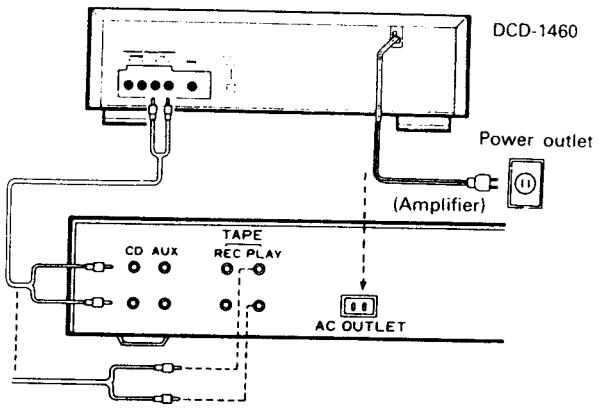
㉛ Digital Output Jack (COAXIAL)
- This jack outputs digital data.
- We recommend using a 75-ohm pin cord (available in stores) for connections.

㉜ Trap Door
- Press the right edge to open the door.
- To close it, press on the right edge. A click is heard to indicate that the door is closed.

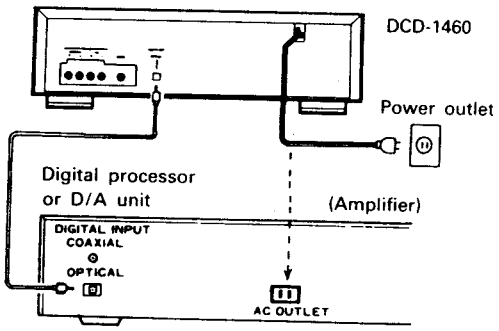
Continuous Operation
If the automatic search reverse button ㉓, the automatic search forward button ㉔, the CALL button ⓫, or the +10 button ⓳ are held in, the function of that button will be repeated.

CONNECTION

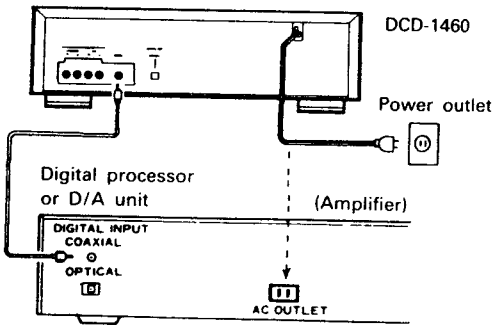
(1) **Connections to the Output Jacks (FIX and VARIABLE)**
Using the included pin cords, connect the left (L) and right (R) output jacks (FIX and VARIABLE) on the DCD-1460 to the left (L) and right (R) CD, AUX, or TAPE PLAY input jacks on an amplifier.
There are two types of output jacks. The output is variable for the VARIABLE jacks, and fixed for the FIX jacks. If you want to be able to control the output level on the DCD-1460, use the VARIABLE jacks.



(2) **Connections to the Digital Optical Output Jack (OPTICAL)**
Use an optical fiber cable to connect the digital optical output jack on the DCD-1460 to the optical input jack on a digital processor or D/A unit.



(3) **Connections to the Digital Output Jack (COAXIAL)**
Use a 75-ohm pin cord to connect the digital output jack (COAXIAL) of the DCD-1460 to the digital input jack (COAXIAL) on a digital processor or D/A unit, available in stores.



Connection Precautions
- Before proceeding with connections or disconnections of cables and power cords, be sure to turn all system components off.
- Ensure that all cables are connected properly to the L (left) and R (right) jacks.
- Insert plugs fully into the terminals.
- Connect the output jacks to the amplifier CD, AUX or TAPE PLAY input jacks.

OPENING AND CLOSING THE DISC HOLDER AND LOADING A DISC

Opening and closing the disc holder (This operation only works while the power is on.)
1. Press the power switch (POWER) to turn on the power.
2. Press the open/close button (⏏ OPEN/CLOSE).

How to load a disc
- Make sure the disc holder is completely open.
- Hold the disc by the edges and place it on the disc tray. (Do not touch the signal surface, i.e., the glossy side.)
- When using 12 cm. diameter discs, make sure the outer edge matches the tray guide circumference (Fig. 1), and when using CD singles (8 cm. diameter) match the outer edge with the inner tray guide circumference. (Fig. 2)
- Press the open/close button (⏏ OPEN/CLOSE) to close the disc holder.
- When the disc holder is closed, the disc is read and after a few seconds the number of tracks and total playing time are displayed on the TRACK NO. and TIME displays, respectively.
- When the disc holder is open and a disc is loaded, you may also press the play (▶ PLAY) or pause (⏸ PAUSE) button to close the disc holder. (If the play button (▶ PLAY) is pressed, playback will start immediately upon the disc contents having been read.)
- When the disc holder is open and a disc is loaded, you may also press the play (▶ PLAY) or pause (⏸ PAUSE) button to close the disc holder. (If the play button (▶ PLAY) is pressed, playback will start immediately upon the disc contents having been read.)

Fig. 1

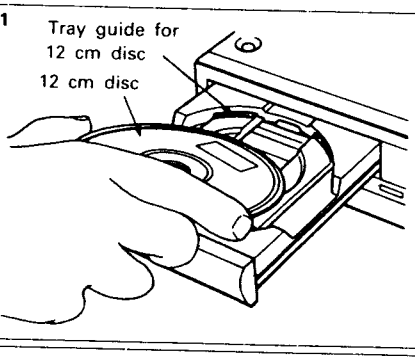
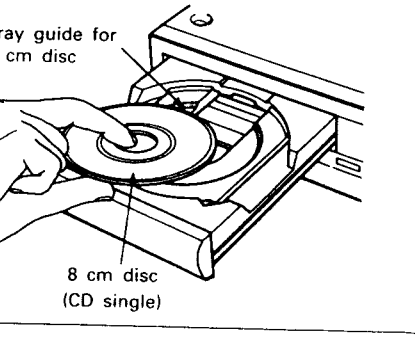


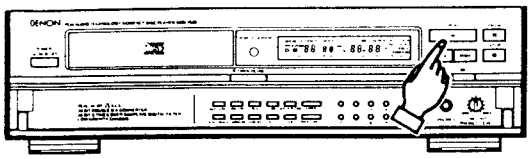
Fig. 2



Caution:
- If your finger should get caught in the disc holder when it closes, press the open/close button (⏏ OPEN/CLOSE).
- Do not place any foreign objects on the disc tray, and do not place more than one disc on the tray at a time. Otherwise malfunction may occur.
- Do not push in the disc tray manually when the power is off as this may cause malfunction and damage the CD player.

NORMAL CD PLAYBACK

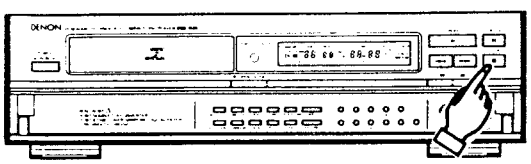
(1) Starting Playback



(▶ PLAY)

1 Turn the power switch on and load the disc.
2 Press the play button (▶ PLAY).
- The number of the track currently playing, the index number, and the elapsed time, etc., are displayed.

(2) Stopping Playback



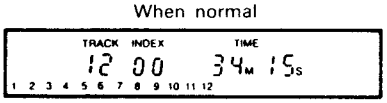
(■ STOP)

1 Press the stop button (■ STOP).
- The stop mode is set automatically once all tracks on the disc are played.

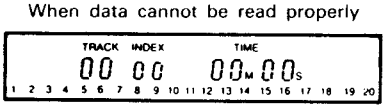
NOTE:
- If no disc is loaded or if the disc is loaded upside-down, the track number, index, and time displays will all read zero, and the entire calendar will light.

- If the information at the innermost side of the disc cannot be read properly due to dirt or scratches, the display will be as shown below, and the number of tracks and remaining time per track will not be displayed. Also, the search operation may take longer than usual.

When normal

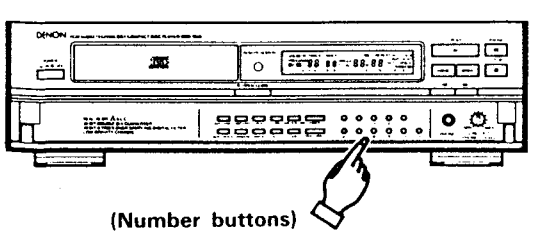


When data cannot be read properly



ADVANCED CD PLAYBACK

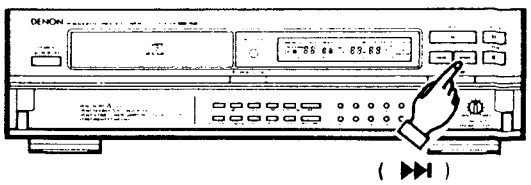
❶ Playing a Specific Track ..... Direct Search



(Number buttons)

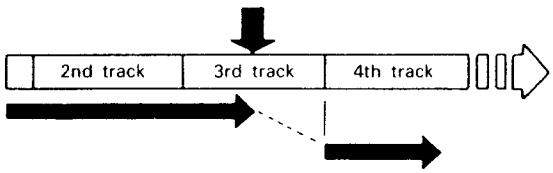
(1) Use the number buttons and the +10 button to input the number of the desired track.
For example, to play the fourth track press 4, and to play the 12th track press +10 and 2. The beginning of the track is found and playback starts.

❷ Moving to Following Tracks During Playback ..... Automatic Search



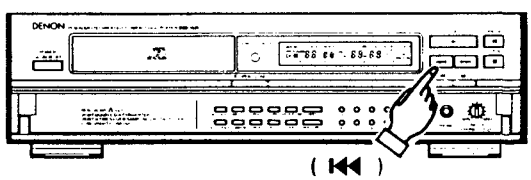
(⏭)

Press the automatic search forward button (⏭).



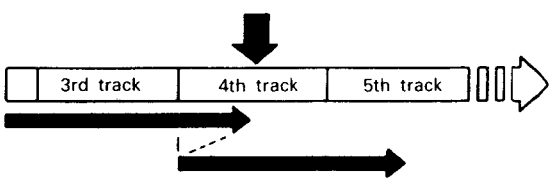
(1) Press the automatic search forward button (⏭).
- If the automatic search forward button (⏭) is pressed again during the search operation, the pickup moves on to the next track, etc.

❸ Returning to the Beginning of the Current Track ..... Automatic Search



(⏮)

Press the automatic search reverse button (⏮).

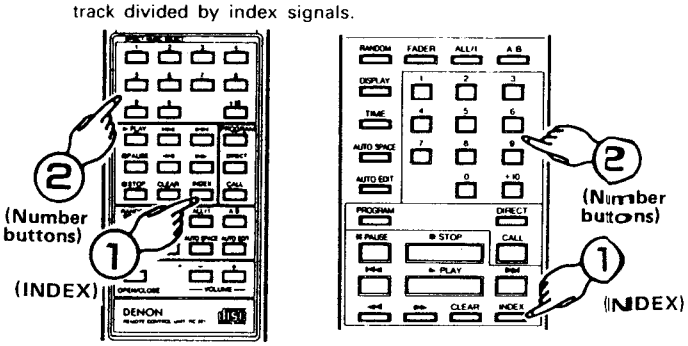


(1) Press the automatic search reverse button (⏮).
- If the automatic search reverse button (⏮) is pressed again during the search operation, the pickup moves on to the previous track, etc.

❹ Finding Sections Inside a Track ..... Index Search

(Remote control only)

- This function allows you to move to the beginning of sections within a track divided by index signals.



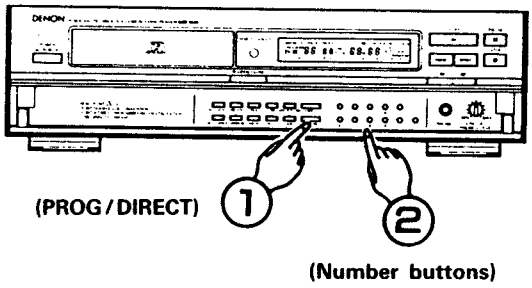
(1) "--" appears on the track number display (TRACK NO.) when the index button is pressed.
(2) Use the number buttons to input the track number.
"--" now appears on the index display (INDEX). Input the desired index number. Playback now begins from that index number.
For example, to start playback from index 2 on track 3, press INDEX, 3, then 2.

Indexes
- Indexes are numbers which are assigned to sections within a track. Check the disc's explanatory notes for the index numbers.
- If you make an index search for an index number that is not on the disc, playback will start from the last index number on the track.

❺ Playing Specific Tracks in a Specific Order ..... Programmed Play

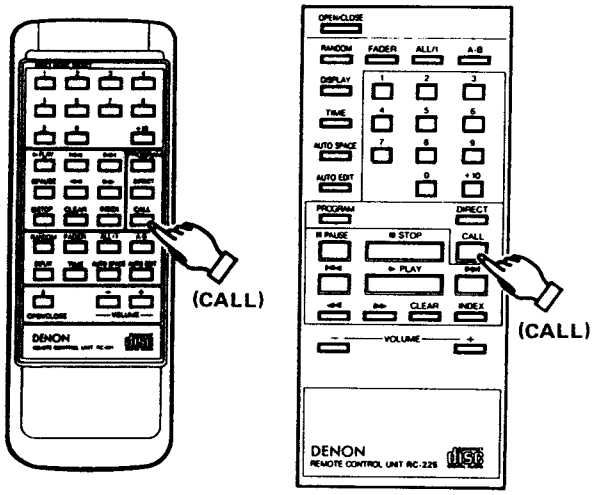
- With this function, you can choose any of the tracks on the disc and program them to play in any order.
- Programming is possible with the disc holder open.
- Up to 20 tracks can be programmed.
- The programmed tracks are shown on the calendar.

(1) Programming



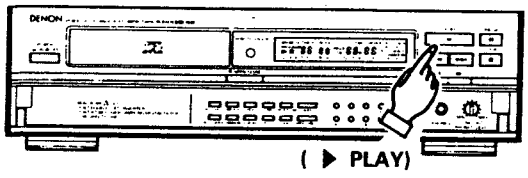
- The PROGRAM indicator lights when the program/direct button (PROG/DIRECT) is pressed. Next, use the number buttons and the +10 button to program the tracks.
  To program tracks 3, 12, and 7, for example, press PROG/DIRECT, 3, +10, 2, and 7.
  The track number lights on the calendar each time a track is programmed. The number of tracks programmed is displayed at the index display, and the total playing time for the programmed tracks is indicated at the time display. After the tracks are programmed, the total number of programmed tracks is displayed at the track number display, and the total playing time for the programmed tracks is indicated at the time display.

(2) Checking the Programmed Tracks (Remote control only)



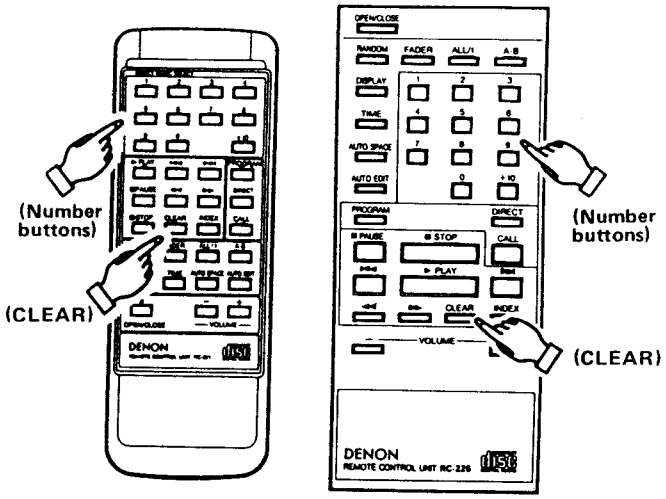
- Press the CALL button.
  The programmed tracks are displayed in order on the TRACK NO. display each time the CALL button is pressed.

(3) Playing the Programmed Tracks



- Press the (▶ PLAY) button to play the tracks in the programmed order.

(4) Correcting the Programmed Tracks (Remote control only)



- To correct the programmed track, press the CLEAR button, then program the correct track. The last track programmed is cleared and the correct track is programmed.
- To clear a track in the middle of the program, press the CALL button to call up the track and then press the CLEAR button to clear it.

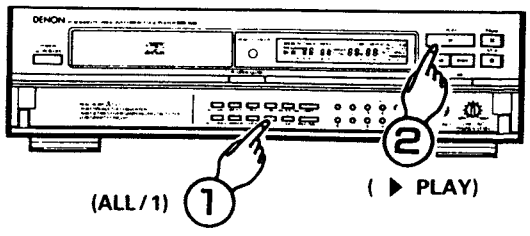
(5) Clearing the Entire Program

- Press the program/direct button (PROG/DIRECT) again to clear the entire program. The entire program is also cleared when the disc holder open/close button (⏏ OPEN/CLOSE) is pressed.
- If the program/direct button (PROG/DIRECT) is pressed during programmed playback, the program is cancelled and normal playback continues from the track currently playing.

NOTES

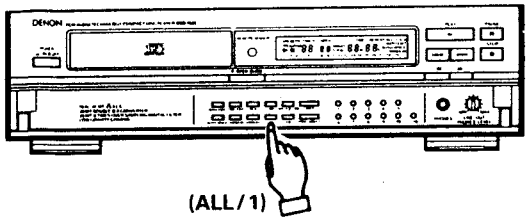
- If the programming operation is performed in the play or pause mode, the current track is programmed as the first track in the program. Other programs can be added, but the number of programmed tracks and playing time will not be displayed.
- Direct search is not possible during programmed playback. Pressing the number buttons adds tracks to the end of the program.
- Programming is also possible when the disc holder is open. A track number greater than the number of tracks on the disc can be set in the program, but it will automatically be cleared from the program before playback starts.
- The remaining time per track can only be displayed for the first 20 tracks on the disc.
- The total program time and remaining program time as well will not be displayed if tracks numbers greater than 20 are programmed.

❻ Repeating the Entire Disc ..... Repeat Playback

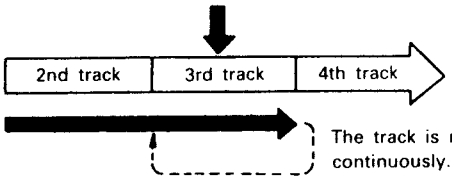


- The REPEAT and ALL indicators lights when the all button (ALL/1) is pressed.
- * The operation is the same whether the play button (▶ PLAY) or the all button (ALL/1) is pressed first.
- The repeat function (for all tracks) is also set if the all button (ALL/1) is pressed during playback.
- To cancel the repeat function, press the all button (ALL/1) again.
- If the all button (ALL/1) is pressed during programmed playback, the programmed tracks are repeated in the programmed order.

❼ Repeating Only a Certain Track ..... Single Repeat

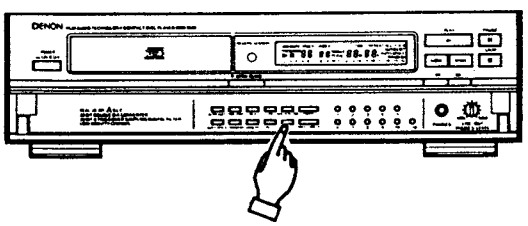


Press 1-track repeat button (1)



- Press this button during playback of a track you like to play it repeatedly.
- When the single repeat button (1) is pressed during playback, the REPEAT and 1 indicators light, and for track numbers of 20 or less, the number of that track is indicated on the calendar and that track is played repeatedly.
- * The single repeat function can be used for track numbers of 21 or greater, but the calendar will be off.
- If the single repeat button (1) is pressed during the stop mode, track number 1 is indicated on the calendar and the single repeat function is set. Press the play button (▶ PLAY) to begin playback.
- Press the single repeat button (1) again to cancel the single repeat mode and return to the normal playback mode and the normal display.

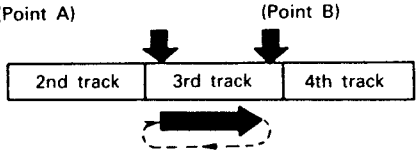
❽ Repeating a Section Between Any Two Points ..... A-B Repeat



- Any section within a track can be played repeatedly, so this function can be used for practicing karaoke or an instrument.
- * When the A-B button is pressed at point A, the REPEAT indicator lights and the A-B indicator starts flashing. When the A-B button is pressed again at point B, the A-B indicator stops flashing and remains lit.

Press the A-B button during playback. (Point A)

Press the A-B button again. (Point B)

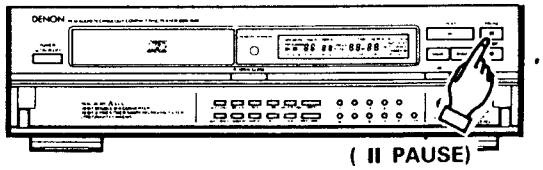


This operation is repeated.

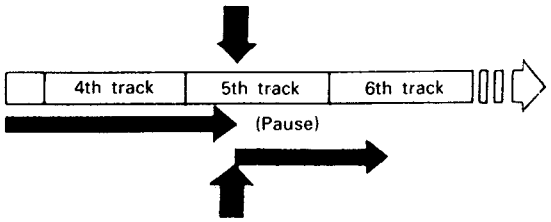
- During playback, press the A-B button at the point where you want to start the repeat (point A), then press it again at the point where you want to end the repeat (point B). The pickup then returns to point A and the section is played repeatedly.
- To cancel A-B repeat, press the A-B button once again. The REPEAT and A-B indicators turn off and normal playback resumes.
- The A-B repeat function will not work during programmed playback.

❾ Stopping Momentarily During Playback ..... Pause

- Playback can be stopped momentarily then resumed from the same point.



① Press the pause button (II PAUSE).



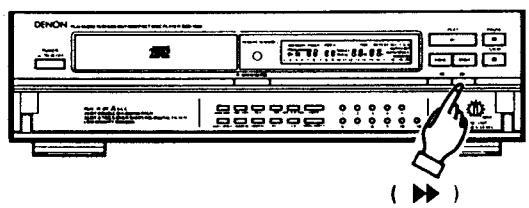
② Press the play button (▶ PLAY) or the pause button (II PAUSE).

* To resume playback, press either the play button (▶ PLAY) or the pause button (II PAUSE).

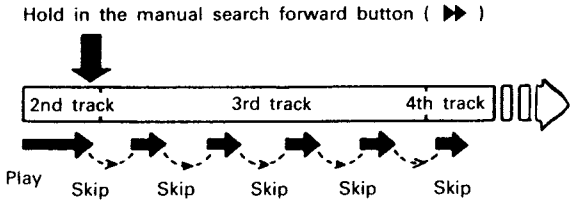
❿ Finding a Track While Listening at High Speed ..... Manual Search

- You can skip through the disc while listening at high speed. This function comes in handy for finding a certain part in the middle of a long track and starting playback from there.
- Once you find the desired position using the manual search operation, release the manual search forward button (▶▶) or manual search reverse button (◀◀) to start normal playback.

(1) Manual Search Forward



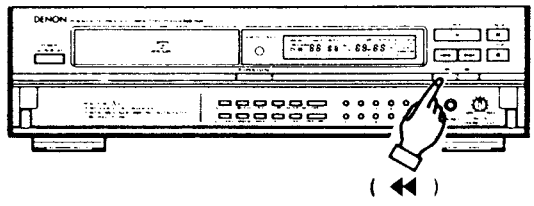
Hold in the manual search forward button (▶▶)



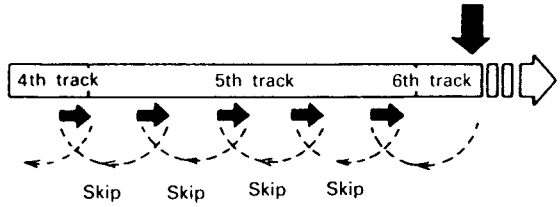
① During playback, press and hold in the manual search forward button (▶▶) to skip through the disc while listening at high speed.

- The number of the track being skipped through, the index number, and the elapsed time for that track are indicated on the display window.
- In the pause mode, the disc moves at about three times the speed as during the play mode, but no sound is heard.
- When the end of the last track is reached while pressing the manual search forward button (▶▶), "JJ" appears on the display window and the manual search operation is stopped.
  To resume playback, press the manual search reverse button (◀◀), then do another operation once the "JJ" disappears from the display.

(2) **Manual Search Reverse**



Hold in the manual search reverse button (◀◀)

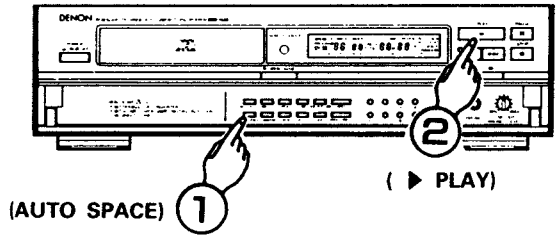


① During playback, press and hold in the manual search reverse button (◀◀) to skip through the disc while listening at high speed.
- The display is the same as during the manual search forward operation.

- In the pause mode, the disc moves at about three times the speed as during the play mode, but no sound is heard.
- When the beginning of the first track is reached while pressing the manual search reverse button (◀◀), "CC" appears on the display window and the manual search operation is stopped.
  To resume playback, press the manual search forward button (▶▶), then do another operation once the "CC" disappears from the display.

⓫ **Inserting Blanks Between Tracks** ..... Auto Space

- This function inserts blank spaces between tracks, making editing easier.

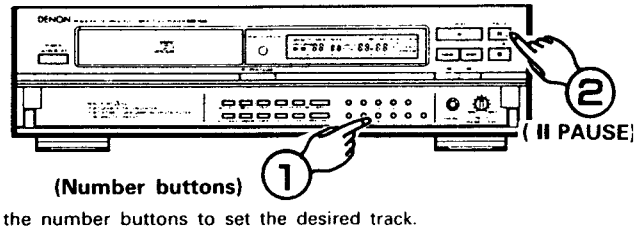


① The AUTO SPACE indicator lights when the auto space button is pressed.
② Press the play button (▶ PLAY) to start playback. When the end of a track is reached, a blank space of approximately 4 seconds is inserted before the beginning of the next track.
③ Press the auto space button again to turn the auto space function off.

⓬ **Pausing At the Beginning of a Track After Searching** ..... Pause

(1) **Direct Search**

- Pausing at the beginning of a track found with the direct search operation comes in handy for practicing karaoke.



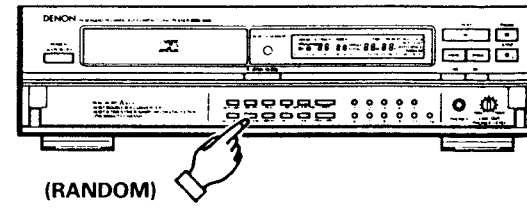
① Use the number buttons to set the desired track.
② Press the pause button (II PAUSE).
- To start playback, press either the play button (▶ PLAY) or the pause button (II PAUSE).

(2) **Program Search**

- Press the pause button (II PAUSE) after programming tracks. The beginning of the first track in the program is found and the disc is paused there.

⓭ **Playing Tracks in Random Order** ..... Random Playback

- All of the tracks recorded on the disc can be played once in random order.



- When the random button (RANDOM) is pressed, the RANDOM indicator lights and random playback starts automatically.
- If the random button (RANDOM) is pressed when tracks are programmed, only the programmed tracks are played at random.
- If the random button (RANDOM) is pressed when the repeat function is set, all tracks will be played through once in random order, after which all tracks will be played through again in different order, and so on.
- During the search operation, the track numbers from the first to the last track on the disc are displayed in rapid succession on the track number display, so you cannot tell what track is going to be played next until playback begins.

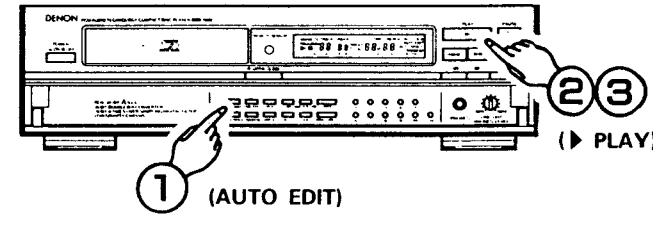
NOTE:
- The total remaining time is not displayed during the random mode.
- The auto edit mode is cancelled if the random button (RANDOM) is pressed during the random mode.

⓮ **Edit Recording on Sides A and B of the Tape** ..... Edit Function

(1) **Auto Edit Function (AUTO EDIT)**

The auto edit function automatically divides the tracks on the compact disc into sides A and B, with the division at the beginning of a track in such as way that the disc's total playing time is divided as close as possible by one half.

① When the AUTO EDIT key is pressed in the stop condition, the total play time of side A (the first half) and the track numbers (on the calendar) are displayed for about 2 seconds. Next, the side B (last half) information is similarly displayed after which the player automatically pauses at the beginning of the first track of side A. AUTO EDIT and PROGRAM will be lit on the display at this time.
② Pressing the play button (▶ PLAY) or the pause button (II PAUSE) will start the play mode. When side A has finished playing, the player will pause at the beginning of the first track on side B.
③ Pressing the play button (▶ PLAY) or the pause button (II PAUSE) again will start the play mode. When side B has finished playing, the player automatically stop.

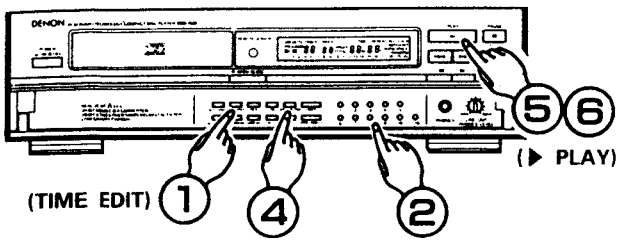


(2) **Editing by Tape Time Specification (TIME EDIT)**

The time edit function permits highly efficient editing in conjunction with the length (tape time) of the cassette tape to be recorded.

① When the TIME EDIT button is pressed, (C-...) will appear and the player will wait for the tape time to be input. AUTO EDIT will light up.
② Input the tape time with the number buttons. (The tape time is the total time of sides A and B.)
  Example: For a 46-minute tape, press 4 and 6.
③ When the tape time has been specified, the tracks of side A that can be recorded are displayed on the calendar and the blank time of tape side A is displayed at TIME. (A-) is displayed at TRACK NO.
④ Pressing the SIDE A/B TIME button permits a check of the tracks that can be recorded on side B and the blank time. (b-) is displayed at TRACK NO.
  Each press of this button alternately displays side A and side B.
⑤ Pressing the play button (▶ PLAY) starts the play from the first track of side A. When side A has finished playing, the player will automatically pause at the beginning of the first track of side B.

(6) Pressing the play button (▶ PLAY) or the pause button (⏸ PAUSE) again will start the play mode. When side B has finished playing, the player automatically stop.



(SIDE A/B TIME) (Number button)

When a mistake has been made in the time specification and the play button (▶ PLAY) has not yet been pressed, pressing the TIME EDIT button will return the settings to the condition of Step ❶. This can be done any number of times.

(7) The time edit function also works in the program track selection mode (Page 8). In this mode, sides A and B can be divided according to the program order.
When the auto space function has been turned on, 4 seconds will be added to the play time of each track.

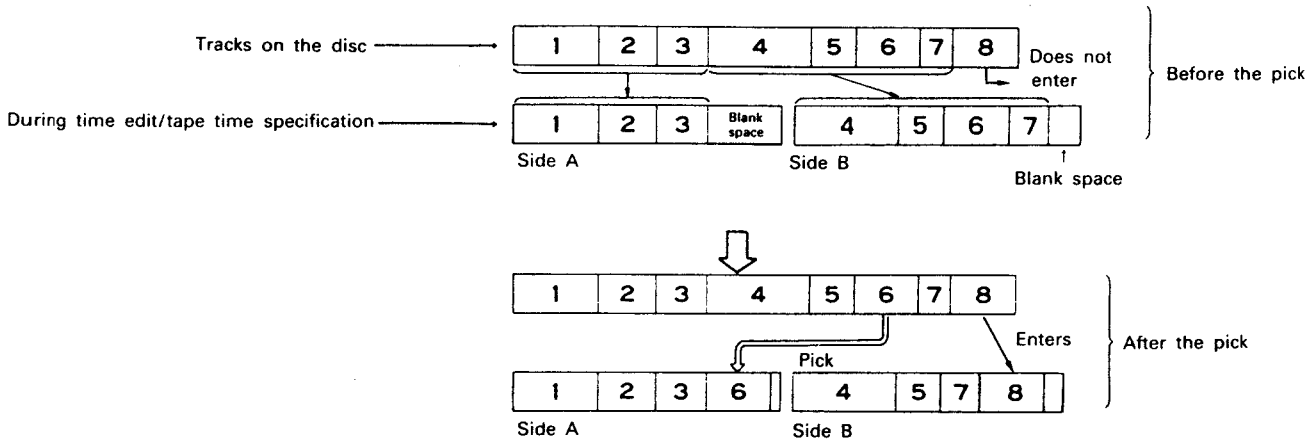
NOTE:

- The automatic search buttons (⏮, ⏭) and the manual search buttons (◀◀, ▶▶) do not function during the time edit operation.

(3) Pick Function (PICK)

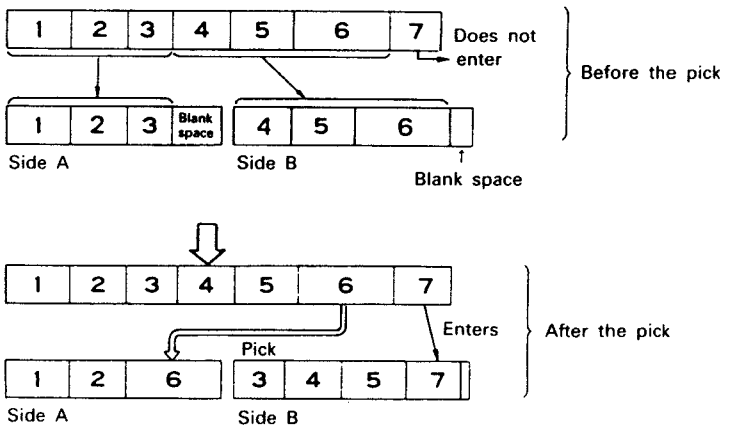
In (2) time edit, the tracks are ordered from the first track or in the programmed order so that a large blank space might remain at the end of the tape. The pick function is used to shorten this blank space.
The pick function is used following the tape time specification of the time edit function and before pressing the play button (▶ PLAY).

(1) **Example of tracks being placed in the blank spaces**



(2) **Example of tracks not being placed in the blank spaces**

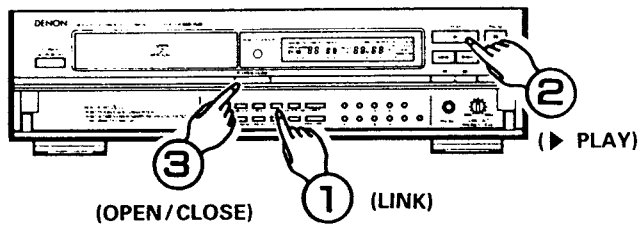
When tracks are not placed in blank spaces as shown in the diagram to the right, the last track (track 3 in the example) is cancelled and substituted with a track from side B.



(4) Link Function (LINK)

The link function provides the convenience of editing a number of discs in succession.
The link operation is used following the tape time specification of the time edit function and before pressing the play button (▶ PLAY).

(1) When the link button (LINK) is pressed, AUTO EDIT will start flashing.
(2) After the tracks have been played, the player will stop automatically. The blank time of the tape will be displayed at this time.
(3) Press the open/close button (≜ OPEN/CLOSE) of the disc holder and change the disc.
(4) Pressing the time edit (TIME EDIT) button will permit editing using the blank time of the tape in Step (2).



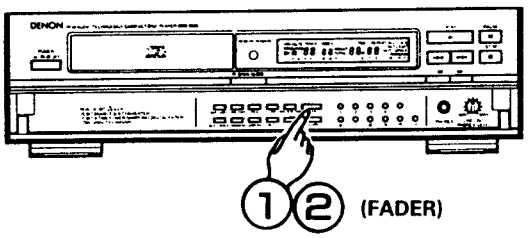
NOTE:
- The link operation is cancelled by the stop button (■ STOP). It will also be cancelled if the disc holder is opened during play.
- When editing has not been performed as far as side B with the time edit (i.e., only for part of side A), editing will be done within the blank time of side A and the blank time of side B.
- When editing has been performed as far as side B with the time edit, the blank time of side B will be used for editing.

⑮ Fading Out or Fading In at the Desired Location ..... Fader Function

(1) Fading out and fading in is possible at the desired position during play Manual Fade

① **Fade Out**
When the fader button (FADER) is pressed during play, fade out will be provided for about 5 seconds. (F_0) will flash at the INDEX display during this operation, and when fade out is completed the player will automatically pause.

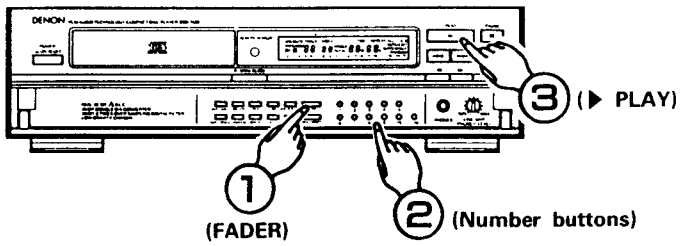
② **Fade In**
When the fader button (FADER) is pressed from the pause mode, the player will start playing and fade in will be provided for about 3 seconds. (F_1) will flash at the INDEX display during this operation.



(2) The time at which fade out occurs can be set in advance Time Fade

(1) When the fader button (FADER) is pressed in the stop mode, (F-.-.-.) appears and the player waits for the input of the fade out time.
(2) Input the fade out time with the number buttons.
(3) Pressing the play button (▶ PLAY) will start the play and (F_0) will light up in the INDEX display.
(4) The (F_0) display will start flashing 5 seconds before the specified fade out time and the fade out will begin. The fade out will end at the specified time and the player will pause automatically.

The time fade function will be cancelled if an automatic search or manual search, etc. is performed during play.

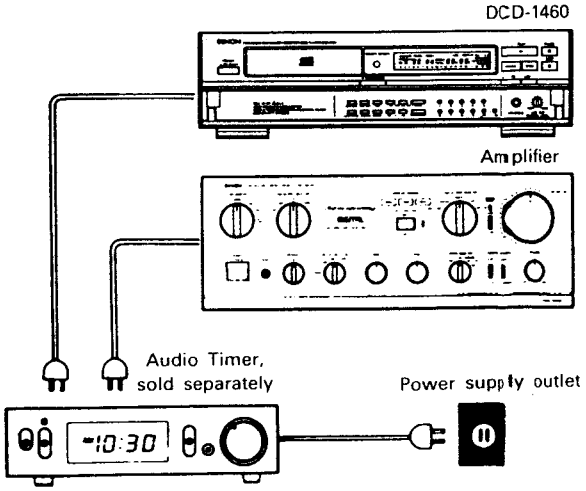


NOTE: The fader function cannot be used when connections are made with the digital output. (OPTICAL and COAXIAL)

TIMER-CONTROLLED PLAYBACK

■ **Operation**
1. Turn on the power of all system components.
2. Set the input selector on the amplifier to correspond to the inputs the CD player is connected to.
3. Make sure a disc has been loaded in the disc holder.
4. Check the time on the timer and then set the desired turn-on time.
5. Turn the audio timer ON.
   Power is turned off automatically in all components connected to the timer.
6. When the preset turn-on time is reached, power is turned on in the system components, and CD playback starts from the first track.

■ **Connection**



- Condensation will form on the disc surface if it is brought into a warm room from a cold area, such as outdoors during winter. Wait until the condensation disappears. Never dry discs with hair dryers, etc.

THE COMPACT DISC

1. **Precautions on handling compact discs**
   - Do not allow fingerprints, oil or dust on the surface of the compact disc. If the signal surface is dirty, wipe it off with a soft, dry cloth. Wipe in circular motions from the center and out.
     Use of DENON's AMC-20/21 CD cleaner is recommended.
   - Do not use water, benzene, thinner, record sprays, electrostatic proof chemicals, or silicone-treated cloth to clean discs.
   - Always use care when handling discs to prevent damaging the surface, in particular when removing a disc from the case and returning it.
   - Do not bend compact discs.
   - Do not apply heat to compact discs.
   - Do not enlarge the hole in the center of the disc.
   - Do not write on the disc and do not attach any labels.
   - Condensation will form on the disc surface if it is brought into a warm room from a cold area, such as outdoors during winter. Wait until the condensation disappears. Never dry discs with hair dryers, etc.

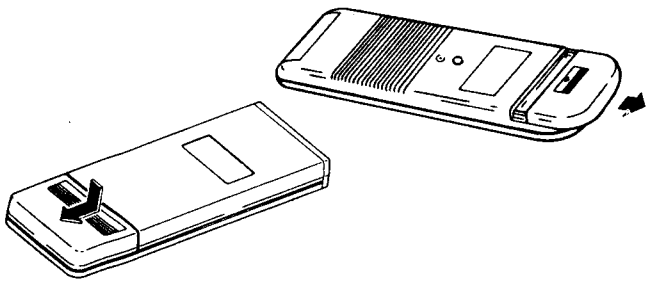
2. **Precautions on storage**
   - After playing a disc, always return it to its case.
   - Keep discs in the cases when they are not to be played. This will protect them from dust and dirt and prolong their service life.
   - Do not store discs in the following places:
     1) Places exposed to direct sunlight for a considerable time.
     2) Places subject to accumulation of dust or high humidity.
     3) Places exposed to high temperatures, such as close to heater outlets.

PLAYBACK USING THE REMOTE CONTROL UNIT

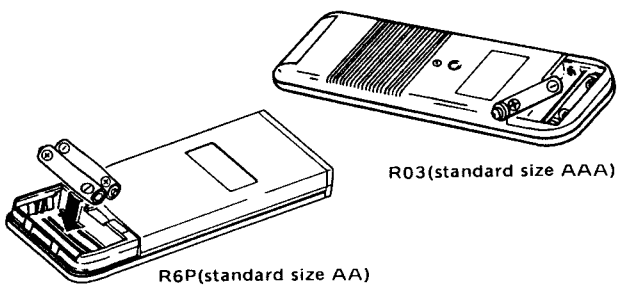
The accessory remote control unit can be used to control the CD player from a convenient distance.

(1) Inserting the dry cell batteries

1. Remove the battery cover on the back of the remote control unit.



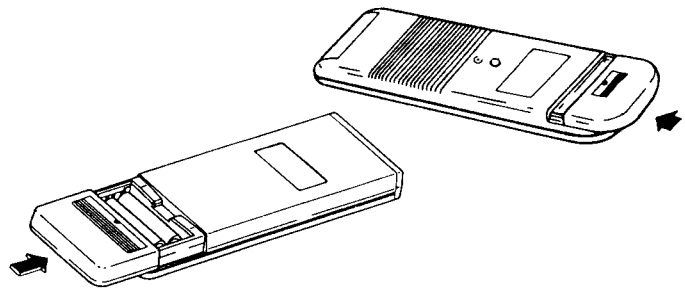
2. Insert two dry cell batteries with correct polarity as indicated inside the battery compartment.



Notes on the Batteries

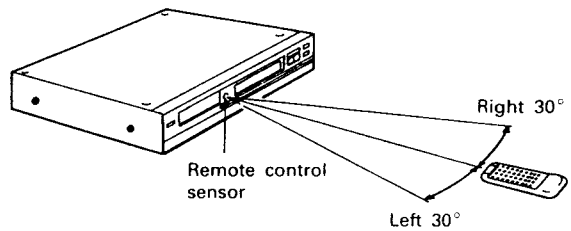
- The batteries will need to be replaced approximately once a year. Replacement may be necessary earlier depending on how much the remote control unit is used.
- If, in less than a year from the time new batteries were inserted, the remote control fails to operate the CD player from a near-by position, it is time to replace the batteries.
- Insert the batteries properly, following the polarity diagram inside the battery compartment, in other words make sure (+) and (–) terminals are properly aligned.
- Batteries are prone to damage and leakage.
  Therefore:
  - Do not combine new batteries with used ones.
  - Do not combine different types of batteries.
  - Do not jumper opposite poles of the batteries, expose them to heat, break them open nor expose of them in open fire.
- If the remote control unit is not to be used for a long period of time, remove the batteries from the unit.
- If the batteries have leaked, remove any traces of battery fluid from the battery compartment, wiping thoroughly with a dry cloth. Then insert new batteries.

3. Replace the battery cover.



(2) Directions for Use

- Operate the remote control unit while pointing it towards the remote control sensor on the CD player (see below).



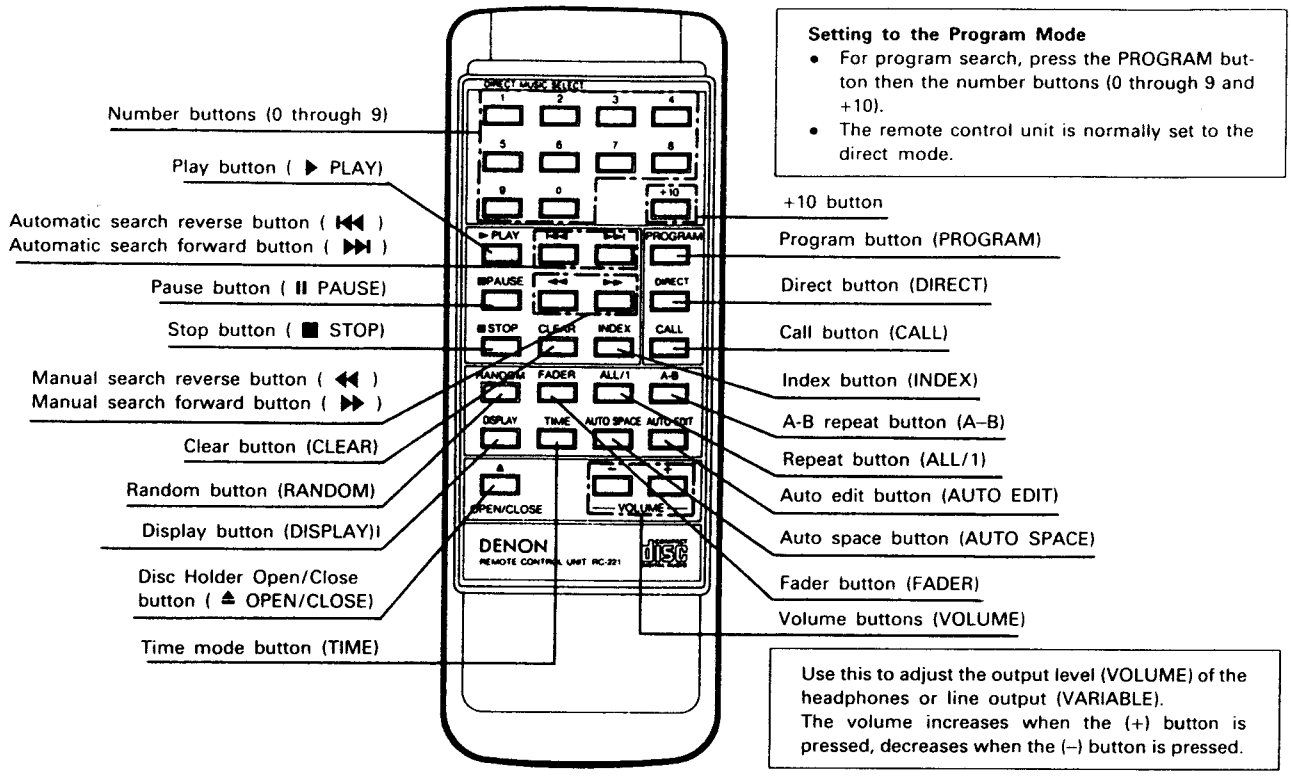
When a remote control signal is received, the remote control indicator on front of the CD player lights briefly.

- The remote control unit can be used at a distance up to 8 meters in a straight line from the CD player. This distance decreases if there are obstructions blocking the signal path or when the remote control unit is operated at an angle from the remote control sensor.
- The buttons on the remote control unit have identical functions with those on the CD player.
  However, the following functions cannot be remote controlled: Power ON/OFF.

Cautions on Use

- Do not press the operation buttons on the main unit and on the remote control unit simultaneously, as this will result in malfunction.
- The remote control unit may not operate properly if the remote control sensor is exposed to direct sunlight or strong artificial lighting, or if there is an object between the remote control unit and the remote control sensor.

REMOTE CONTROL UNIT RC-221

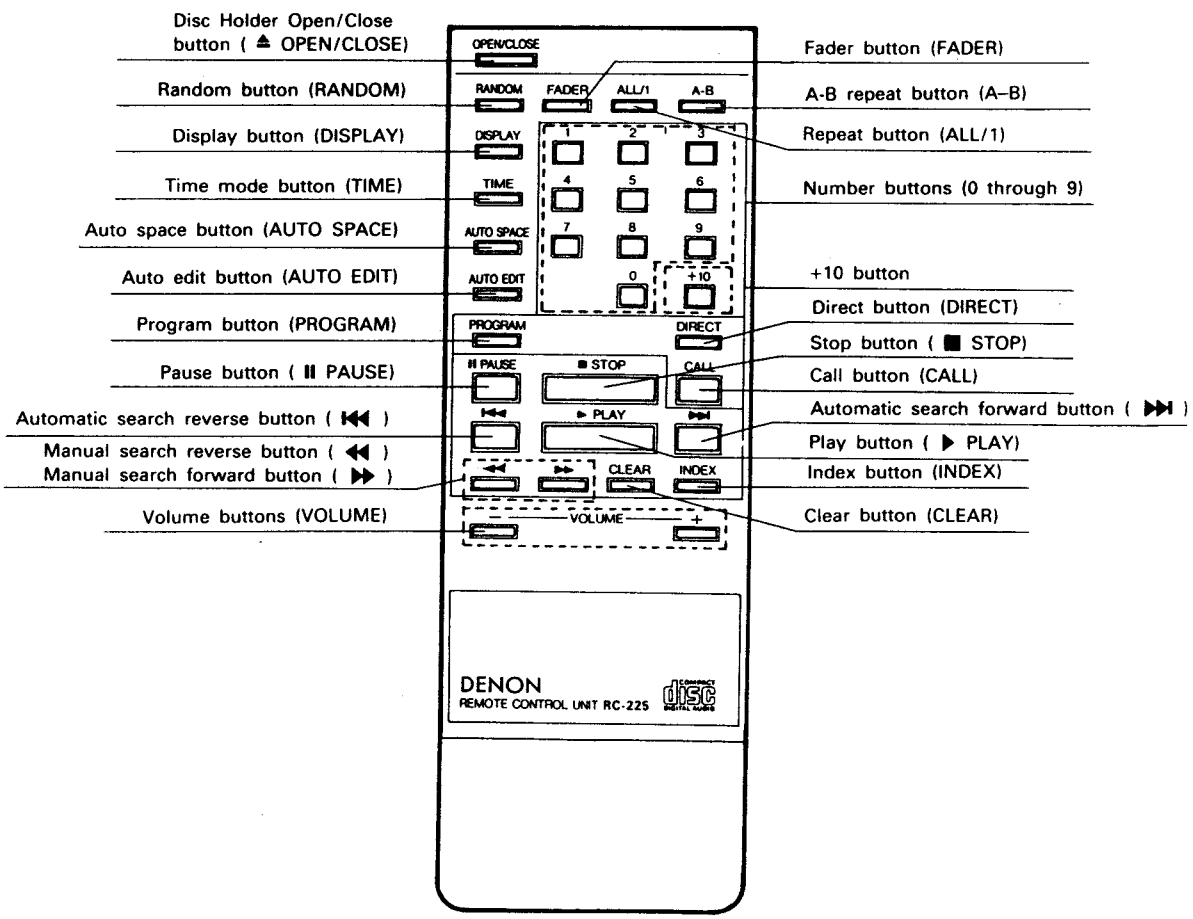


Setting to the Program Mode

- For program search, press the PROGRAM button then the number buttons (0 through 9 and +10).
- The remote control unit is normally set to the direct mode.

Use this to adjust the output level (VOLUME) of the headphones or line output (VARIABLE).
The volume increases when the (+) button is pressed, decreases when the (–) button is pressed.

REMOTE CONTROL UNIT RC-225

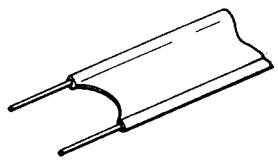


- **Direct Search**
  Normally, direct search is possible simply by pressing the desired number buttons.
- **Program Search (During playback, the track which is currently playing is programmed as the 1st track.)**
  Press the PROGRAM button, then press the number buttons.
  For example, to program tracks number 3, 11, and 5, press PROGRAM → 3 → +10 and 1 → 5.
  To cancel the program, press the DIRECT button.
- **Inputting the Track Numbers**
  For track numbers below 9, simply press the corresponding button. For track numbers of 10 and greater, press the +10 then the number buttons.
  For example, for track number 22 press +10 twice then 2.
- **Volume**
  The volume control on the unit will operate when the volume buttons are pressed. The volume can be checked by looking at the position of the control.

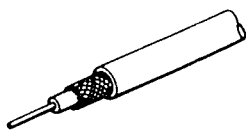
INSTALLATION PRECAUTIONS

The CD player uses a microcomputer for controlling internal electronic circuits. In the event that the player is used while a near-by tuner or TV is turned on, although unlikely, interference could occur either in the sound from the tuner or the picture of the TV. To avoid this, please take the following precautions.

- Keep the CD player as far away from the tuner or TV set as possible.
- Keep the power cable and connecting cable of the CD player separate from the antenna wires of the tuner and TV.
- Interference is particular likely to occur when an indoor antenna or a 300-ohm feeder cable is used. Thus, use of an outdoor antenna and 75-ohm coaxial cable is strongly recommended.



300-ohm feeder cable



75-ohm coaxial cable

TROUBLESHOOTING

If the CD player does not seem to be functioning properly, check the following:

Disc holder does not open or close.
- Is the power on?

When a disc is loaded, 00 00 0000 is displayed.
- Is the disc loaded properly? ..... See page 6

When the play button (▶ PLAY) is pressed, playback does not start.
- Is the disc dirty or scratched? ..... See page 13

There is no sound, or it is distorted.
- Is the output cord properly connected to the amplifier? ..... See page 6
- Have the amplifier controls been set correctly?

Volume is low.
- Is volume setting (with volume buttons on remote control unit) correct? ..... See page 14

A specific section of the disc will not play.
- Is the disc dirty or scratched? ..... See page 13

Programmed playback does not work.
- Have programming been properly done? ..... See pages 8 and 14

Incorrect operation when buttons on the remote control are pressed.
- Is the remote control unit being operated too far from the CD player? ..... See page 13
- Are there obstacles blocking the ray?
- Is the remote control sensor exposed to strong light?
- Are the batteries exhausted?

SPECIFICATIONS

AUDIO

No. of Channels:	2 channels
Frequency Response:	2 ~ 20,000 Hz
Dynamic Range:	100 dB
Signal-to-noise Ratio:	110 dB
Harmonic Distortion:	0.0025% (1 kHz)
Separation:	103 dB (1 kHz)
Wow & Flutter:	Below measurable limit: (±0.001% W. peak)
Output Voltage:	FIX 2.0 V, VARIABLE 0 ~ 2.0 V

DISCS Compact Disc format

GENERAL CHARACTERISTICS

Power Supply:	50/60 Hz, Voltage is shown on rating label.
Power Consumption:	15W
Dimensions:	434 (17.1 in) W x 122 (4.0 in) H x 320 (12.4 in) D mm
Weight:	7 kg

FUNCTIONS AND DISPLAY

Functions:	Direct selection, automatic search, programmed playback, repeat playback, manual search, auto space, auto edit, emphasis feature
Display:	Track number, time, music calendar, and engaged modes
Others:	Headphones jack

REMOTE CONTROL UNIT RC-225, RC-221.

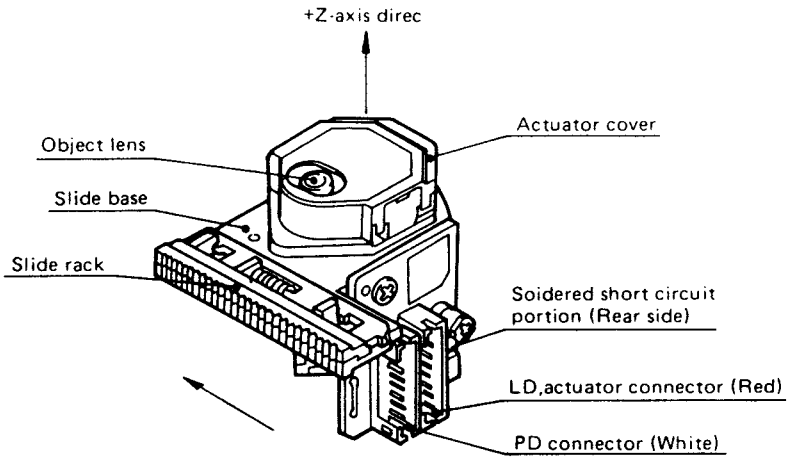
Remote Control System:	Infrared pulse system
Power Supply:	3 V DC; two RGP (standard size AA) dry cell batteries
External Dimensions:	64 (2-33/64") W x 176 (6-15/16") H x 18 (45/64") D mm
Weight:	140 g (including batteries)

SUPPLIED ACCESSORIES Pin-plug connection cord

* Design and specifications are subject to change without notice in the course of product improvement.

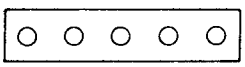
NOTE FOR HANDLING OF LASER PICK-UP

DESCRIPTION OF THE COMPONENTS



Label

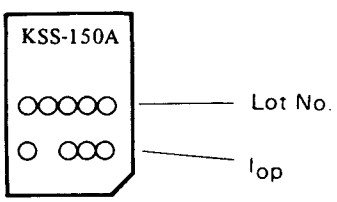
1. Serial number



This denotes the serial number used for quality control in the manufacturing plant.

Note: The numbers of figures in English numerals may be changed.

2. Label

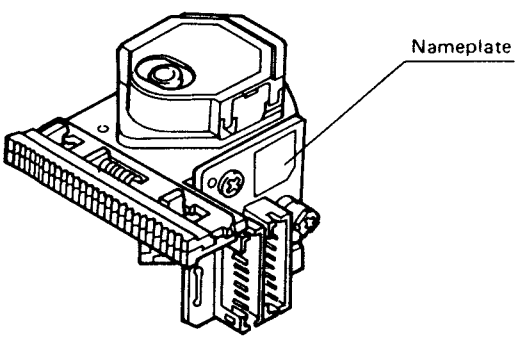


year
(last figure)
day month | quality control No.
○○ ○ ○ ○

but Oct. Nov. and Dec. are expressed by alphabetical letters of X, Y and Z.

10 1 10^{-1}
quality control ○ ○ ○ ○
LD drive current

3. Position of the labels

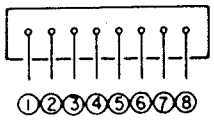


Note:
- The expressed unit is by mA, with omission of the decimal point as for example, 56.5 mA will be expressed as 565, but the head of English letter means the control in the manufacturing plant.
- If a voltage value in between No. 2 and No. 6 pins of TP102 of the servo and signal processor unit, the value of laser diode current "iop" can be found by a formula

"iop 1" = $\frac{V1}{22}$.

ELECTRICAL PIN CONNECTION

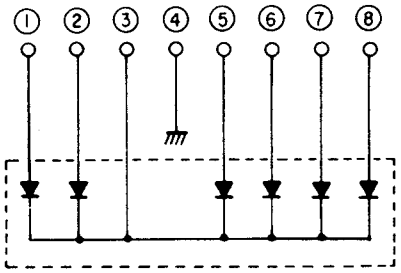
1. PD connector (JAPAN SOLDERLESS TERMINAL MFG CO. LTD "PH series" 8 pin)



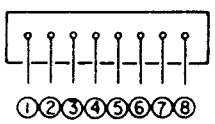
COLOR : WHITE

Pin No.	PD element
①	F
②	E
③	K
④	GND
⑤	A
⑥	B
⑦	C
⑧	D

PC Circuit Diagram



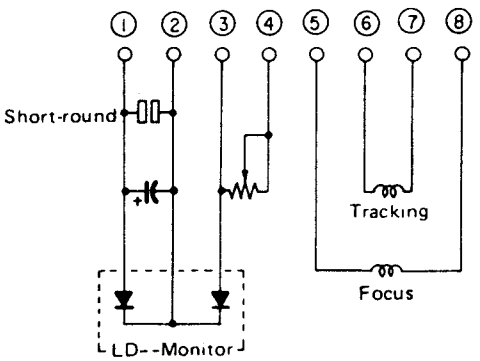
2. Actuator & LD connector (JAPN SOLDERLESS TERMINAL, MFG CO. LTD "PH series" 8 pin)



COLOR : RED

Pin No.	description
①	Laser
②	GND
③	monitor
④	reference
⑤	Fo (-)
⑥	Tr (+)
⑦	Tr (-)
⑧	Fo (+)

LD · Actuator Circuit Diagram



Cautions for Handling the Laser Pick-up

The laser pick-up KSS-150A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Do not disassemble or attempt to readjust it. Please keep the following instructions carefully in handling pick-up.

1. Handle with Care

(1) Storage
Do not store the pick-up in dusty, high-temperatured or high-humidity environments.

(2) Please take care for preventing from shock by falling down or careless handling.

2. Laser Diode (LD)

(1) Protect your eyes
The laser beam may damage the human eye, since the intensity of the focused spot may reach 7×10^3 W/cm^2 even if the intensity at the objective lens is 400 μW maximum. As the light beam spreads after focused through the objective lens, it does not effect you in the place as far as more than 30 cms. However, do not look at the laser light beam either through the objective lens directly nor another lens or a mirror.

(2) Poison of As
Since the LD chip contains As (Arsenic), as GaAs + GaAlAs, as known as the poison, although the poison is relatively weak, in comparing with others, e.g. As_2O_3, $AsCl_3$ etc., and the amount is small, avoid putting the chip in acid or an alkali solution, heating it over 200°C or putting it into your mouth.

(3) Avoid surge current or electrostatic discharge
The LD may be damaged or deteriorated by it's own strong light if a large current is supplied to it, even if only a short pulse.
Make sure that there is no surge current in the LD driving circuit by switches or else. Be careful to handle pick-up as it may be damaged in a moment by human electrostatic discharge. The pins of the LD are short-circuited by solder for protection during shipment.
For safety handling of an LD, grounding the human body, measuring equipments and jig is strongly recommended. And still it is further desirable to make use of mat on the platform and floor for handling the LD.
To open the short circuit, remove the soldering quickly with a soldering iron whose metal part is grounded. The temperature of the soldering iron should be less than 320°C (30W).

3. Actuator

(1) The performance of the actuator may be effected if magnetic material is located nearby, since the actuator has a strong magnetic circuit. Do not permit dust to enter through the clearance of the cover.

(2) Cleaning the lens
It may change the specifications by attaching dust or ash on the object lens. Clean the lens with a cleaning paper dampened a little water, not pressing lens with so much strength by the cleaning paper.

4. Metal Bearing

As the metal bearing of Cu-compound sintered alloy is impregnated with FROIL946P (by the Kanto Kasei Kogyo), never fail to supply the bushing with the same lubricant at the time of replacing the pick-up.

5. Handling

Please handle the laser pick-up with holding the slide base (rosin molded part).
When either a part of human body or some other things may happen to touch directly with the circuit part of P.W. Board, it may cause deterioration, take careful attention in handling this base.

6. Deterioration

When difficulty occurs either in focus or tracking adjustment nor able to adjust the focus or tracking, it seems that the laser pick-up is deteriorated. In these cases, check a value of laser diode current and give a decision for deterioration.

7. Fundamental Deterioration Decision of Laser Pick-up

(1) If a voltage value in between No. 2 and No. 6 pins of TP102 of the servo and signal processor unit, the value of laser diode current "iop" can be found by a formula "iop1" = $\frac{V1}{22}$.

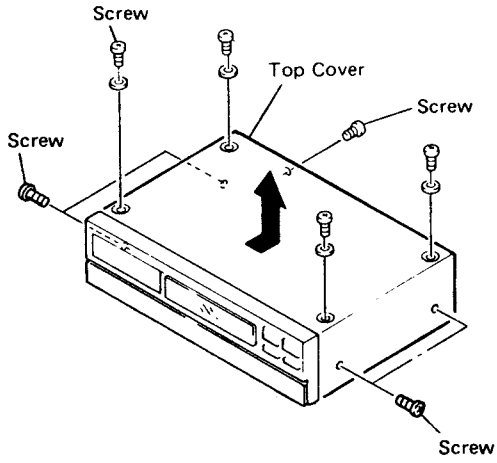
(2) If an "iop" exceeds ±10% compared with the IOP indication on the laser pick-up nameplate, there is a fair chance for deterioration when it is checked under a circumambient temperature 23°C.

(3) When the circumambient temperature changes ±10°C, "iop1" will change ±5%. The "iop1" will also be changed by the passage of time.

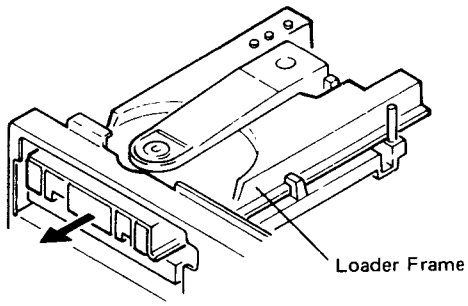
(4) In case of the above conditions taking into consideration and performed the adjustment in proper way, if the HF level at pin No. ① of TP102 on Main Unit, and in between GND4 becomes 1V or lesser values; or ajitter occurs great, the laser pick-up may be deteriorated.

DISASSEMBLY

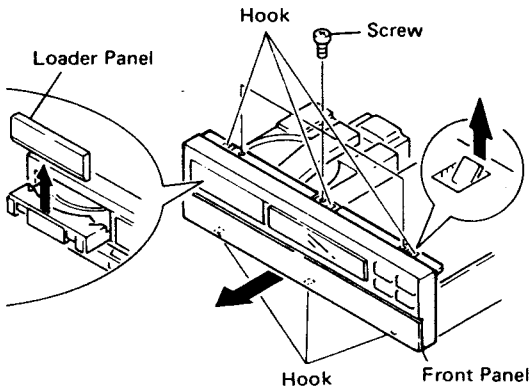
- **Top Cover**
  1. Remove 4 upper screws, rear screw, and 4 side screws.
  2. Remove Top Cover to arrow direction.



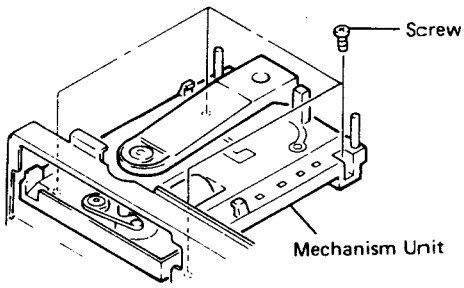
- **Loader**
  1. Remove Loader Frame forward.



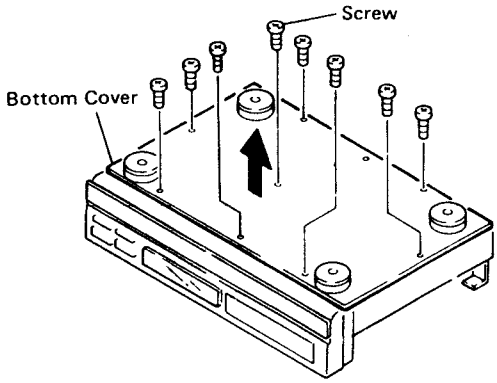
- **Front Cover**
  1. Pull Loader forward and remove Loader Panel.
  2. Remove 3 screws.
  3. Remove Front Panel clear of upper and lower hooks.



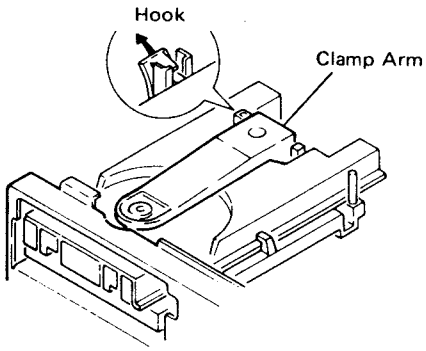
- **Mechanism Unit**
  1. Remove 4 screws.
  2. Remove Mechanism Unit.



- **Bottom Plate**
  Remove 8 screws.



- **Clamp Arm**
  Remove hook as arrow direction.



ADJUSTMENT

Microcomputer built in the unit, comprises service program to facilitate servo adjustment by pushing operation button.

1. Start service program

(1) Turn power switch OFF.
(2) Shortcircuit pins ③, ④ of jumper (TP102) on P.W.B. (Main Unit)
(Caution) Do not touch other pins.
(3) Turn power switch ON.
(Service program starts, and displays track number 01)

(Caution)
- When service program started normal operation of buttons will be defeated.

2. Service program function

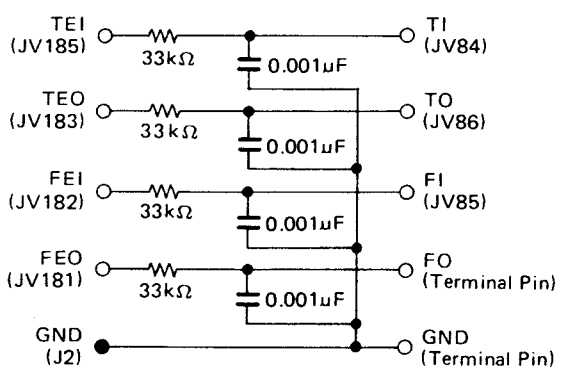
Button	Function	Description
▲ OPEN/CLOSE	Opens or closes the disc holder.	• Opens or closes only when disc is stopped. • Operate other keys after open or close .
■ STOP	Stops system function.	• Displays track number 01 . • Push when adjustment completed, or do it again.
▶ PLAY	Starts focus servo and disc turns.	• Push when adjust tracking offset. • When completed, displays track number 02 .
❚❚ PAUSE	Starts focus servo, tracking servo, slide servo, spindle servo.	• When PLAY button is pushed, starts tracking servo and slide servo. • When completed, track number 03 .
Other button	No normal operation.	• Do not operate buttons other than above. • If misoperated, immediately turn power switch OFF.

(Caution)
- Do not use remote control during service program mode.

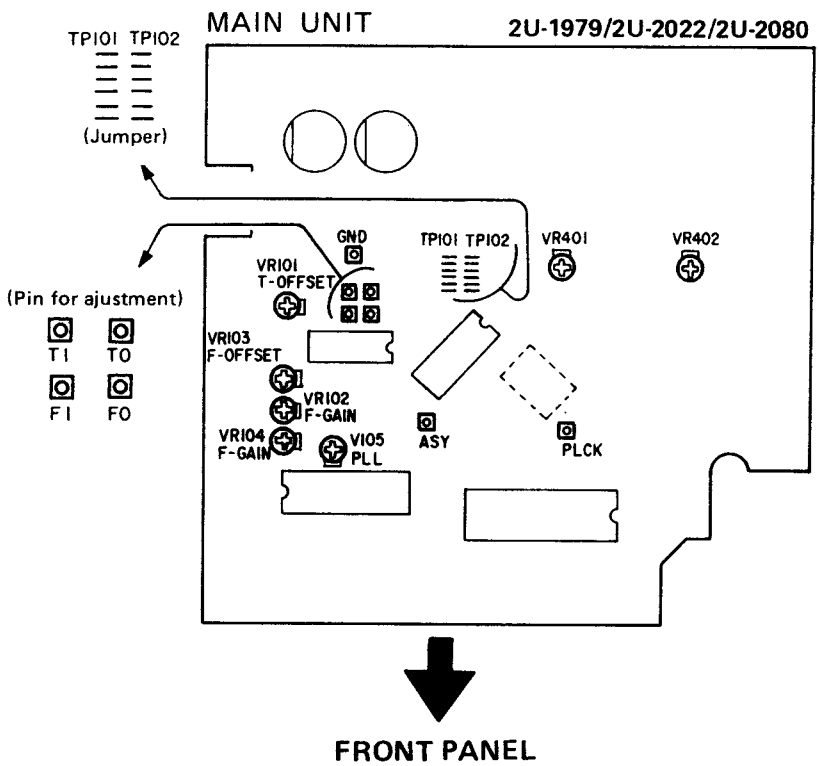
3. Adjustment

(1) Prior to start adjustment
Before adjusting laser P.U. and spindle motor, be sure adjust turntable height at the time of turntable assembly.
(2) Necessary equipment for adjustment
1 Dual trace oscilloscope
2 Reference disc (CA-1094) 富田靖子
3 Oscillator (10 Hz ~ 10 kHz, 0 ~ 3 Vp-p)
4 Frequency counter (readable more than 5 MHz)
5 Filter for measurement

(Filters for measurement were put in Main unit.)



(3) Location

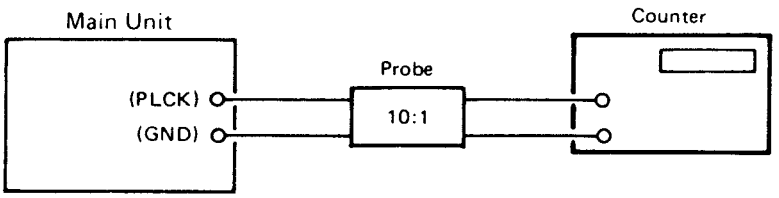


(4) Preset

1.	Start service program.	
2.	Preset VR101~105 as per right figure.	VR101 (T-OFFSET) 3 O'clock VR103 (F-OFFSET) 3 O'clock VR102 (F-GAIN) 3 O'clock VR104 (T-GAIN) 3 O'clock VR105 (PLL) 6 O'clock
3.	Step.	1. PLL 2. Tracking offset 3. Focus gain 4. Focus offset 5. Tracking gain 6. Tracking offset recheck.

4. PLL Adjust

Connection

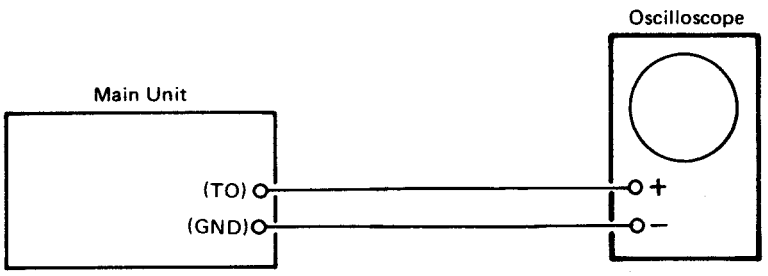


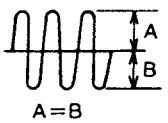
- Ground Test point [ASY] to GND1 or GND2.

Adjust	Check	Step
(Volume)	(Counter)	• Turn PLL volume VR105 so that frequency counter reads 4.32 MHz.
VR105	4.32 MHz ± 10 kHz	

5. Tracking offset

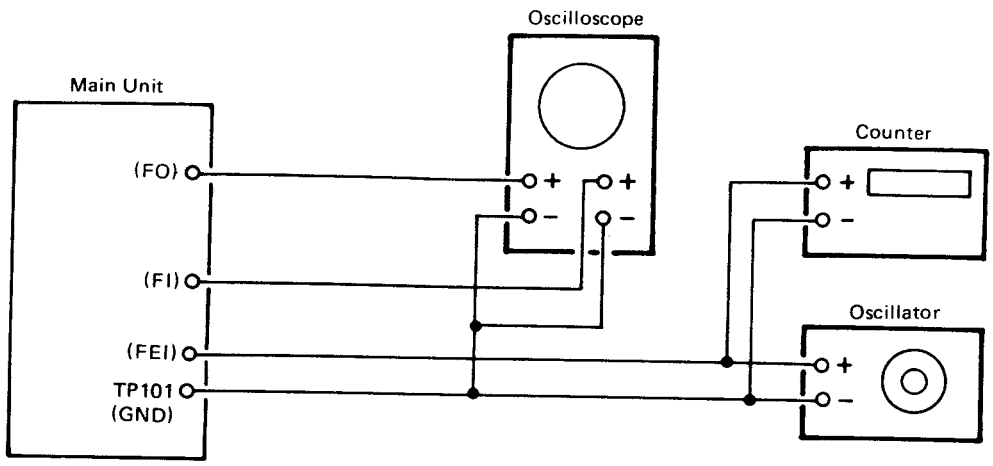
Connection



Oscilloscope (DC range)		Adjust	Check	Step
V	H	(Volume)	(Oscilloscope)	1. Push [▲ OPEN/CLOSE] and load disc holder reference disk. 2. Push [▲ OPEN/CLOSE] and close disc holder. 3. Push [▶ PLAY] to turn disc. (Displays track number 01) 4. Short (+) (-) of oscilloscope and check the base line. 5. Adjust VR101 [T-OFFSET] to equalizer upper and lower amplitude of the waveform.
0.1V/div	1~2 ms/div	VR101	 A=B	

6. Focus gain

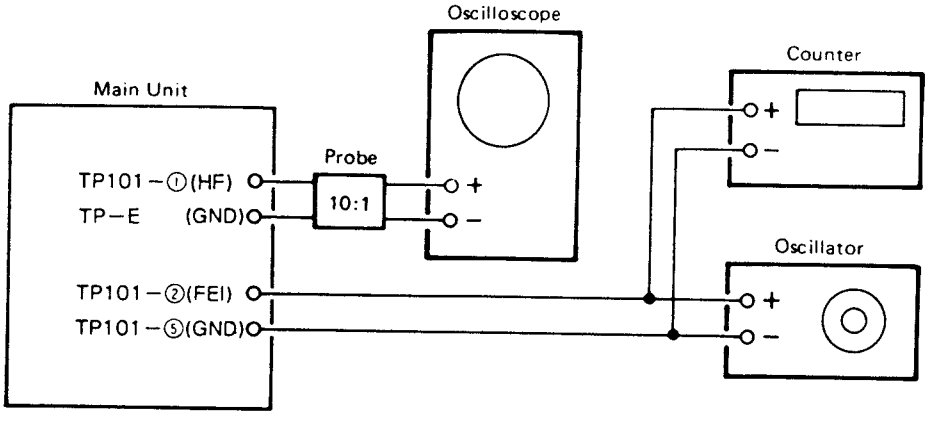
Connection

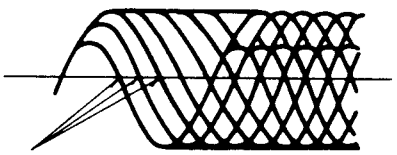
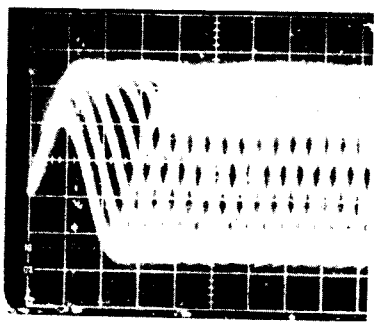


Oscillator	Counter	Oscilloscope		Adjust	Check	Step
		V	H	(Volume)	(Oscilloscope)	
750 Hz 1 Vp-p (±0.1 V)	750 Hz	• DC range • X-Y mode		VR102	Y axis X axis Phase 90° Waveform not right X axis Y axis	1. Push [II PAUSE] (Displays track number 03) 2. Set oscillator to 750 Hz/1 Vp-p. 3. Switch oscilloscope input to X-Y mode. 4. Adjust VR102 [F-GAIN] to symmetrize Lissajous figures to X and Y axes.

7. Focus offset

Connection



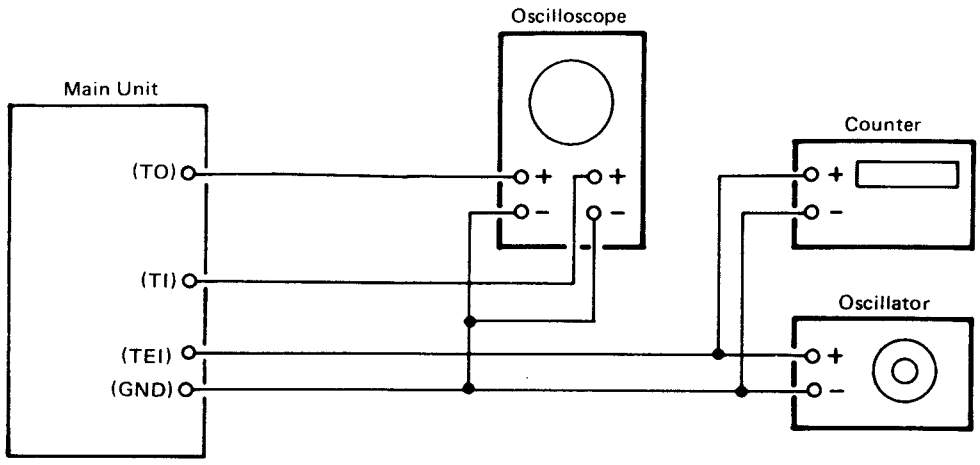
Oscillator	Counter	Oscilloscope		Adjust	Check
		V	H	(Volume)	(Oscilloscope)
750 Hz 1 Vp-p (±0.1 V)	750 Hz	50 mV/div or 20 mV/div	0.2 μs/div or 0.5 μs/div	VR103	 Adjust to minimize pattern jitter.  Pattern
		• Set input mode to ALTERNATE or CHOPPER.			

Step

1. Push [II PAUSE].
2. Set oscillator to 750 Hz, 1 Vp-p (±0.1V)
3. VR103 [F-OFFSET] to minimize pattern jitter.

8. Tracking gain

Connection



• Caution: Connect oscillator after [II PAUSE] pushed and servo function started.

Oscillator	Counter	Oscilloscope		Adjust	Check	Step
		V	H	(Volume)	(Oscilloscope)	1. Push [II PAUSE]. (Displays track number 03)
• 2.1 kHz (±120 Hz) • 3 Vp-p (±0.1V)	2.1 kHz (±120 Hz)	• DC range • X-Y mode		VR104	Y axis / X axis / Phase 90°	2. Connect oscillator. 3. Set oscillator to 2.1 kHz/3 Vp-p. 4. Switch oscilloscope input to X-Y mode. 5. Adjust VR104 [T-GAIN] to symmetrize Liseajous figures to X-Y axes.

9. Tracking offset adjustment check

(1) Adjust tracking offset again.
(2) Push [■STOP] and stop disc.
(3) Push [▶PLAY] and check disc turns.
Note: If disc does not turn, push [▶PLAY] again and check track number 02 is diasplayed.
(4) Check oscilloscope waveform upper and lower amplitude are same to base line.
(5) Push [■STOP] and stop disc.
(6) Push [▲OPEN/CLOSE] and remove the reference disc.

HEAT RUN MODE FUNCTION

1. Heat Run Mode

1) To active

Push and hold 1, 4, and 7 keys simultaneously, and turn power on. The remote control sensor indicator lights to show that the unit is shifted to Heat Run Mode.

Be sure the disc has been loaded.

Press the disc holder open/close button (▲OPEN/CLOSE) to cancel Heat Run Mode.

2) Operation

Shifting the unit to Play Mode from Heat Run Mode makes the unit replays from the first music, by opening the loader once and re-closes it when finish playing the last music (comes into lead out).

Hereafter, operates open/close of loader, servo on, reads TOC, and repeats playing the two music the first and last ones.

If a system error occurs during Heat Run Mode, it displays the error message TNO on the INDEX, and stops the operation. And displays the previous operation cycle number on TIME.

1. E1

   When focus servo is ineffective:

   1-1 E1-00 No FOK avails.
   1-2 E1-01 FOK avails but no FZC.
   1-3 E1-02 Both FOK and FZC avail, but FZC is short of masking time.
   1-4 E1-03 Both FOK and FZC avail, but FZC did not turn to "L" within specified time.

2. E2

   Disc turns, but fails to detect synchronous pattern (No GFS).

3. E3

   Fails to detect synchronous pattern (No GFS drives.):

   3-1 E3-00 During PLAY.
   3-2 E3-01 During SEARCH.

4. E4

   Servo avails, but fails to read TOC:

   4-1 E4-00 Fails to read subcode.
   4-2 E4-01 Reads subcode, but fails to lead-in.
   4-3 E4-02 Subcode and lead-in avail, but fails to read TOC within 15s.

5. E5

   Defective loader. (Switch fails to turn on.)

6. E6

   PU innermost circle switch fails to turn off.

7. E7

   PU innermost circle switch fails to turn on.

2. Chucking Test

1) To activate

Start regular Heat Run Mode, and press II (PAUSE) twice times, or +10 key. (During PLAY)

2) Operation

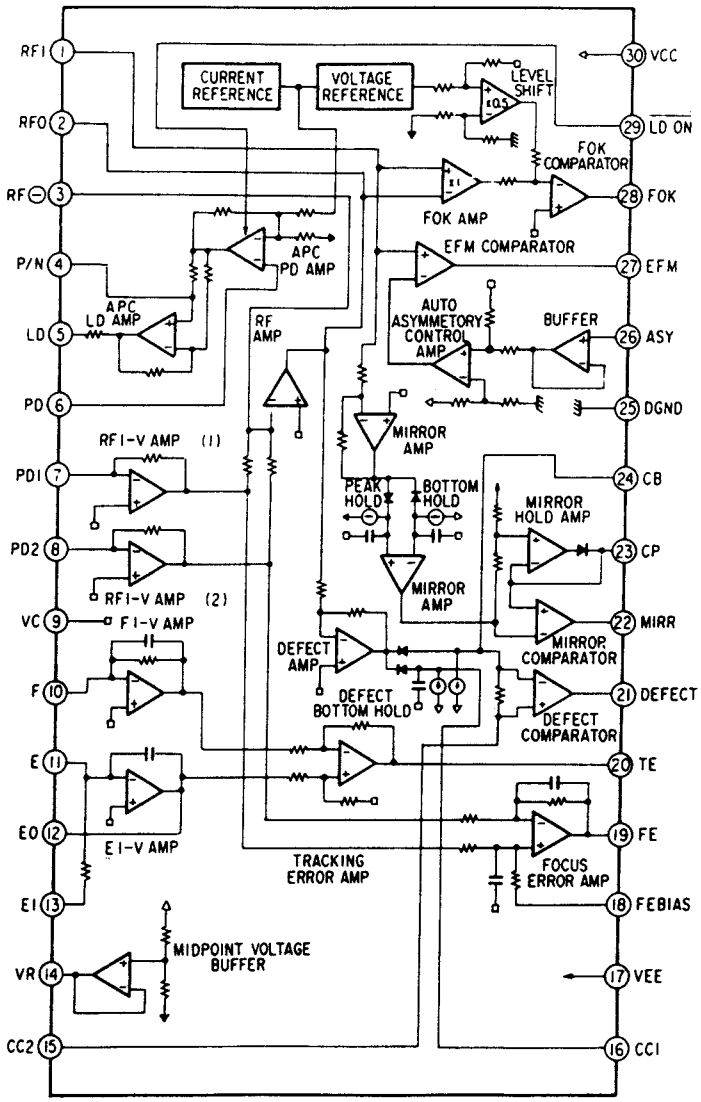
Repeats Close/Open loader, Servo on, reads TOC, selection of the first music.

3) Error Message

The same as per regular Heat Run Mode. Always displays number of operation cycle on TIME, immediately after the loader closes.

IC TERMINAL FUNCTION LIST

CXA1081S



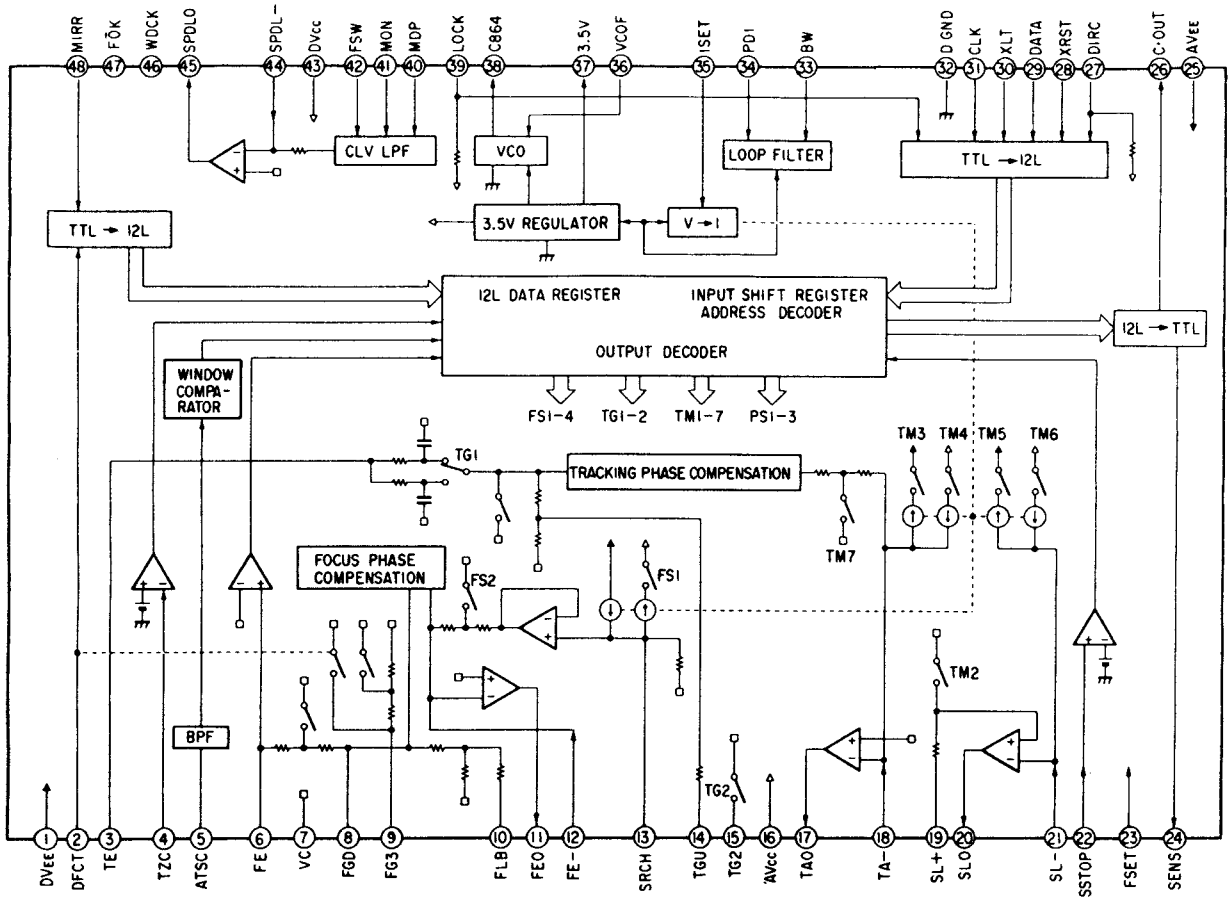
CXA1081S Terminal Function

Terminal No.	Terminal Symbol	I/O	DC voltage (V)	Terminal Function
1	RFI	I	0	Input terminal of capacitance coupled RF summing amplifier output.
2	RFO	O	V_{RFO}	Terminal for RF summing amplifier output. Check point of Eye pattern.
3	RF(–)	I	0	Feedback input terminal of RF summing amplifier.
4	P/N	I	0 (VC)	P-sub/N-sub shifting terminal for Laser Diode (LD). (DC voltage: at N-sub.)
5	LD	O	-1.8	Output terminal of APC (Automatic Power Control) LD amplifier. (DC voltage: at N-sub, PD opened.)
6	PD	I	0	Input terminal of APC (Automatic Power Control) PD amplifier. (DC voltage: opened.)
7	PD1	I	0	Reverse input terminal of RF I-V amplifier (1). Receives a input current through A + C terminals of photo diode.
8	PD2	I	0	Reverse input terminal of RF IV amplifier (2). Receives a input current through B + D terminals of photo diode.
9	VC	–	0	At ± dual-power supply: Becomes GND. At mono-power supply: Becomes VR. (connect to pin 14.)
10	F	I	0	Reverse input terminal of F I-V amplifier. Receives a input current through F terminal of photo diode.
11	E	I	0	Reverse input terminal of E I-V amplifier. Receives a input current through E terminal of photo diode.
12	EO	O	0	Output terminal of E I-V amplifier.
13	EI	I	0	Feedback input terminal of E I-V amplifier. For gain controlling of E I-V amplifier.
14	VR	O	V_{CVO}	Output terminal of DC voltages $(V_{CC} + V_{EE})/2$.
15	CC2	I	1.0	Input terminal of capacitance coupled defect bottom hold output.
16	CC1	O	1.2	Output terminal of defect bottom hold.
17	V_{EE}	–	-2.5	At ± dual-power supply: Becomes negative power supply terminal. At mono-power supply: Becomes GND.
18	FE BIAS	I	0	Bias terminal for non-reverse side of focus error amplifier. For CMR controlling of focus error amplifier.
19	FE	O	V_{FEO}	Output terminal of focus error amplifier.
20	TE	O	V_{TEO}	Output terminal of tracking error amplifier.
21	DEFECT	O	V_{DFCTL}	Output terminal of defect comparator. (DC voltage: Connect a 10 kΩ load resistance.)
22	MIRR	O	V_{MIRL}	Output terminal of MIRR comparator. (DC voltage: Connect a 10 kΩ load resistance.)
23	CP	I	-1.3	Connecting terminal for MIRR hold capacitor. Non-reverse input terminal of MIRR comparator.
24	CB	I	0	Connecting terminal for defect bottom hold capacitor.
25	D GND	–	-2.5	At ± dual-power supply: GND. At mono-power supply: GND (V_{EE}).
26	ASY	I	–	Input terminal of auto-asymmetry control.
27	EFM	O	V_{EFMH}	Output terminal of EFM comparator. (DC voltage: Connect a 10 kΩ load resistance.)
28	FOK	O	V_{FOKL}	Output terminal of focus OK comparator. (DC voltage: Connect a 10kΩ load resistance.)
29	$\overline{\text{LD ON}}$	I	-2.5 (D GND)	ON/OFF shifting terminal for laser diode (LD). (DC voltage: At LD ON.)
30	V_{CC}	–	2.5	Positive power supply terminal.

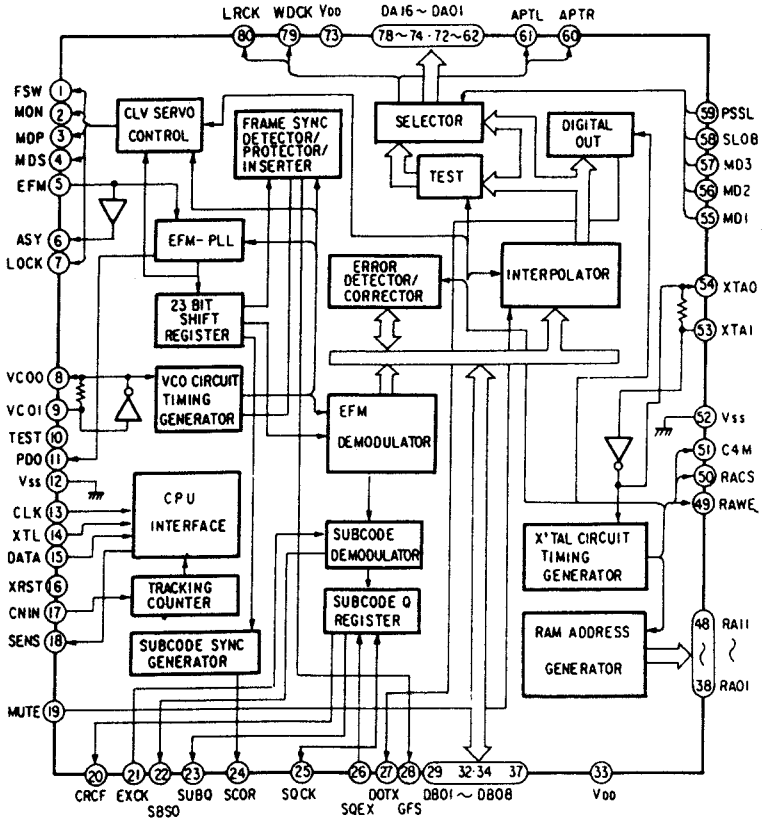
CXA1182AS Terminal Function

Terminal No.	Terminal Symbol	Terminal Function
2	DFCT	Defect signal input terminal. Defect measure circuit activates at "H".
3	TE	Tracking error signal input terminal.
4	TZC	Tracking zero cross comparator input terminal.
5	ATSC	Input terminal of ATSC detecting window comparator.
6	FE	Focus error signal input terminal.
8	FGD	In case of reducing higher range gain of focus servo, connect a capacitor between this terminal and terminal number (9).
9	FS3	Shifts higher range gain of focus servo by FS3 ON/OFF.
10	FLB	Terminal for external time constant to increase lower range of focus servo.
11	FEO	Focus drive output.
12	FE(–)	Reverse input terminal for focus amplifier.
13	SRCH	Terminal for external time constant to make focus search waveform.
14	TGU	Terminal for external time constant to shift higher range gain of tracking.
15	TG2	Terminal for external time constant to shift higher range gain of tracking.
17	TAO	Tracking drive output.
18	TA(–)	Reverse input terminal for tracking amplifier.
19	SL(+)	Non-reverse input terminal of sled amplifier.
20	SLO	Sled drive output.
21	SL(–)	Reverse input terminal of sled amplifier.
22	SSTOP	Terminal for limit switch ON/OFF to detect disc inner most circle.
23	FSET	Terminal to compensate peak in focus tracking phase, and for setting F_O in CLV LPF.
24	SENS	Terminal to output FZC, AS, TZC, SSTOP, $\overline{BUSY}$ by command from CPU.
26	C. OUT	Terminal to output signal for track number count.
27	DIRC	Terminal is used at the time of 1 track jump. A 47 kΩ pull up resistor is included.
28	XRST	Reset input terminal. Resets at "L".
29	DATA	Serial data input from CPU.
30	XLT	Latch input from CPU.
31	CLK	Serial data transfer clock input from CPU.
33	BW	Terminal for external time constant of loop filter.
34	PDI	Input terminal of PDO for CXD1125 phase comparator.
35	ISET	Delivers a current to set the height of focus search, track jump, and sled kick.
36	VCOF	Resistance value between this terminal and terminal (37) is nearly proportion to VCO free-run frequency.
38	C864	Output terminal of 8.64 MHz VCO.
39	LOCK	Reckless drive protection circuit activates at "L". A 47 kΩ pull up resistor is included.
40	MDP	Terminal to connect MDP terminal of CXD1125.
41	MON	Terminal to connect MON terminal of CXD1125.
42	Fsw	Terminal for external LPF time constant of CLV servo error signal.
44	SPDL(–)	Reverse input terminal for spindle drive amplifier.
45	SPDLO	Spindle drive output.
46	WDCK	Clock input for auto-sequence. Normally applied 88.2 kHz.
47	FOK	FOK signal input terminal.
48	MIRR	MIRR signal input terminal.

CXA1182AS



CXD1125Q



CXD1125Q Terminal Function

Terminal No.	Terminal Symbol	I/O	Terminal Function
1	FSW	O	Output to shift time constant of output filter for spindle motor.
2	MON	O	ON/OFF control output for spindle motor.
3	MDP	O	Drive output for spindle motor. Rough control at CLV-S mode and phase control at CLV-P mode.
4	MDS	O	Drive output for spindle motor. Speed control at CLV-P mode.
5	EFM	I	Input of EFM signal from RF amplifier.
6	ASY	O	Output to control slice level of EFM signal.
7	LOCK	O	Sampling GFS signal by WFCK/16 and if it is "H", delivers "H"; if it is continuously "L" 8 times, delivers "L".
8	VCOO	O	VCO output. When EFM signal is locked, f=8.6436 MHz.
9	VCOI	I	VCO input.
10	TEST	I	(0V).
11	PDO	O	Phase comparing output for EFM signal and VCO/2.
12	Vss	–	GND (0V).
13	CLK	I	Serial data transfer clock input from CPU. Latches data by rising edge of clock.
14	XLT	I	Input of Latch from CPU. Latches 8-bit shift register data (serial data from CPU) to each register.
15	DATA	I	Input of serial data from CPU.
16	XRST	I	System reset input. Resets at "L".
17	CNIN	I	Input of tracking pulse.
18	SENS	O	Answer to address, output internal condition.
19	MUTG	I	Input of muting. When internal register A's ATTM is in "L", and MUTG is in "L" for normal condition; "H" for no sound condition.
20	CRCF	O	Output of CRC check result of sub-code Q.
21	EXCK	I	Clock input for serial output of sub-code.
22	SBSO	O	Serial output of sub-code.
23	SUBQ	O	Q output of sub-code.
24	SCOR	O	Output of sub-code sync. S0 + S1.
25	SQCK	I/O	Reading clock of sub-code Q.
26	SQEX	I	Selection input of SQCK.
27	DOTX	O	Digital out output. (When CXD1130Q or DO is OFF, output $\overline{\text{WFCK}}$.)
28	GFS	O	Output of indication for frame sync lock condition.
29	DB08	I/O	Data terminal of external RAM. DATA8 (MSB).
30	DB07	I/O	Data terminal of external RAM. DATA7.
31	DB06	I/O	Data terminal of external RAM. DATA6.
32	DB05	I/O	Data terminal of external RAM. DATA5.
33	V_{DD}	–	Power supply (+5V).
34	DB04	I/O	Data terminal of external RAM. DATA4.
35	DB03	I/O	Data terminal of external RAM. DATA3.
36	DB02	I/O	Data terminal of external RAM. DATA2.
37	DB01	I/O	Data terminal of external RAM. DATA1 (LSB).
38	RA01	O	Address output of external RAM. ADDR01 (LSB).
39	RA02	O	Address output of external RAM. ADDR02.
40	RA03	O	Address output of external RAM. ADDR03.
41	RA04	O	Address output of external RAM. ADDR04.
42	RA05	O	Address output of external RAM. ADDR05.
43	RA06	O	Address output of external RAM. ADDR06.
44	RA07	O	Address output of external RAM. ADDR07.
45	RA08	O	Address output of external RAM. ADDR08.

Terminal No.	Terminal Symbol	I/O	Terminal Function
46	RA09	O	Address output of external RAM. ADDR09.
47	RA10	O	Address output of external RAM. ADDR10.
48	RA11	O	Address output of external RAM. ADDR11.
49	RAWE	O	Write enable signal output for external RAM. (Active at "L".)
50	RACS	O	Chip select signal output for external RAM. (Active at "L".)
51	C4M	O	Dividing output of X'tal. f = 4.2336 MHz.
52	V_{SS}	–	GND (0V).
53	XTAI	I	X'tal oscillation circuit input. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz.
54	XTAO	O	X'tal oscillation circuit output. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz.
55	MD1	I	Mode selection input 1.
56	MD2	I	Mode selection input 2.
57	MD3	I	Mode selection input 3.
58	SLOB	I	Code switching input for audio data output. At "L" for 2's compliment output; at "H" for offset binary output.
59	PSSL	I	Mode switching input for audio data output. At "L" for serial output; at "H" for parallel output.
60	APTR	O	Control output for aperture compensation. In "H" for R-ch.
61	APTL	O	Control output for aperture compensation. In "H" for L-ch.
62	DA01	O	At PSSL = "H" for DA01 (LSB of parallel voice data) output. At PSSL = "L" for C1F1 output.
63	DA02	O	At PSSL = "H" for DA02 output; PSSL = "L" for C1F2 output.
64	DA03	O	At PSSL = "H" for DA03 output; PSSL = "L" for C2F1 output.
65	DA04	O	At PSSL = "H" for DA04 output; PSSL = "L" for C2F2 output.
66	DA05	O	At PSSL = "H" for DA05 output; PSSL = "L" for C2FL output.
67	DA06	O	At PSSL = "H" for DA06 output; PSSL = "L" for C2PO output.
68	DA07	O	At PSSL = "H" for DA07 output; PSSL = "L" for RFCK output.
69	DA08	O	At PSSL = "H" for DA08 output; PSSL = "L" for WFCK output.
70	DA09	O	At PSSL = "H" for DA09 output; PSSL = "L" for PLCK output.
71	DA10	O	At PSSL = "H" for DA10 output; PSSL = "L" for UGFS output.
72	DA11	O	At PSSL = "H" for DA11 output; PSSL = "L" for GTOP output.
73	V_{DD}	–	Power supply (+5V).
74	DA12	O	At PSSL = "H" for DA12 output; PSSL = "L" for RAOV output.
75	DA13	O	At PSSL = "H" for DA13 output; PSSL = "L" for C4LR output.
76	DA14	O	At PSSL = "H" for DA14 output; PSSL = "L" for $\overline{C21O}$ output.
77	DA15	O	At PSSL = "H" for DA15 output; PSSL = "L" for C21O output.
78	DA16	O	At PSSL = "H" for DA16 (MSB of parallel voice data) output. At PSSL = "L" for DATA output.
79	WDCK	O	Strobe signal output. At DF ON, 176.4 kHz. At CXD1125Q or DF OFF, 88.2 kHz.
80	LRCK	O	Strobe signal output. At DF ON, 88.2 kHz. At CXD1125Q or DF OFF, 44.1 kHz.

Note:

C1F1: ┐ Monitor output for error correction state what C1 is at
C1F2: ┘ decode.

C2F1: ┐ Monitor output for error correction state what C2 is at
C2F2: ┘ decode.

C2FL: Correction state output. Becomes "H" when C2 system in which presently under correction is unable to correct.

C2PO: C2 pointer indication output. Synchronizes with audio data output.

RFCK: Read frame clock output. 7.35 kHz of X'tal system.

WFCK: Write frame clock output. 7.35 kHz when locked on to X'tal system.

$\overline{PLCK}$: VCO/2 output. When locked to EFM signal, f = 4.3218 MHz.

UGFS: Output of unprotected frame sync pattern.

GTOP: Indication output of frame synchro in protected condition.

RAOV: Overflow and underflow indication outputs of ±4 frame jitter absorbing RAM.

C4LR: Strobe signal. At DF ON, 352.8 kHz. At CXD1125Q or DF OFF, 176.4 kHz.

$\overline{C21O}$: Reverse output of C210.

C21O: Bit clock output. At DF ON, 4.2336 MHz. At CXD1125Q or DF OFF, 2.1168 MHz.

DATA: Serial data output of audio signal.

PARTS LIST OF P.W.BOARD

SIG. AUDIO UNIT (2U-1979/2U-2022/2U-2080)

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP (Europe and U.K. Models)			
IC100	262 0842 002	CXA-1081S (S-DIP)	
IC102	262 1008 007	CXA-1182S (S-DIP)	
IC103,104	263 0691 007	LA-6520	
IC201	262 1265 002	TC74HCU04AP	
IC202	262 0736 008	CXD1125	
IC203	262 1330 005	: MK6116N-20	
◆	262 0554 002	HM6116P/LP-4/3/2	
IC204	263 0535 008	M51954A	
IC250	262 1264 100	HD404729A42S	
IC251	499 0150 008	SBX1610-52	
IC301	262 1139 002	SM5818AP	
IC302	262 1241 000	YM3615B	
IC304,305	262 1180 006	CF37606	
IC401,402	262 1171 002	PCM61P	
IC403,404	263 0655 001	: PC74HC4066P	
◆	262 1240 001	HD74HC4066	
IC405,406	262 0864 006	μPC4570C	
IC407,408	262 1126 002	: PC74HC00P	
◆	262 0591 007	HD74HC00P	
IC409,410, 502	263 0611 003	: NE4558N	
◆	263 0565 007	BA15218	
IC501	262 1198 005	NJM4556D	
IC600,601	263 0553 006	NJM7805FA	
IC602	263 0501 003	NJM79M05FA	
IC603,604	268 0073 905	ICP-N15T	
IC605	269 0096 008	HFBR1550	
IC700	262 1338 007	: PC74HC02P	
◆	262 0655 008	HD74HC02P	
IC701	262 1177 006	: PC74HC74P	
◆	262 0594 004	HD74HC74P	
TR101	272 0025 907	2SB562 (C) TF	
TR113,390	269 0025 901	RN1202 (10K-10K)	
TR311~320 511,512	273 0253 918	2SC2878 (A/B)	
TR391	269 0026 900	RN2202 (10K-10K)	
TR501,600	271 0387 901	: JC557 A/B	
◆	271 0101 925	2SA933(Q)T-70	
TR601	271 0102 908	2SA1015 (Y)	
D201~208	276 0049 914	1S2076ATE	
D305	276 0417 915	1SS270ATE	
D600~609	276 0552 906	1SR139-200T-32	
D6510	276 0501 928	HZ33L-3TD	
D611	276 0051 973	HZ7C-2TE	
SEMICONDUCTOR GROUP (U.S.A., Canada and Australia Models)			
IC100	262 0842 002	CXA-1081S (S-DIP)	
IC102	262 1008 007	CXA-1182S (S-DIP)	
IC103,104	263 0691 007	LA6520	
IC201	262 1265 002	TC74HCU04AP	
IC202	262 0736 008	CXD1125	
IC203	262 0554 002	HM6116P/LP-4/3/2	
IC204	263 0535 008	M51954A	
IC250	499 0150 008	SBX1610-52	
IC251	262 1264 100	HD404729A42S	
IC301	262 1139 002	SM5818AP	
IC302	262 1241 000	YM3615B	
IC304,305	262 1180 006	CF37606	
IC401,402	262 1171 002	PCM61P	
IC403,404	262 1240 001	HD74HC4066	
IC405,406	262 0864 006	μPC4570C	
IC407,408	262 0591 007	HD74HC00P	
IC409,410 502	263 0565 007	BA15218	
IC501	263 0198 005	NJM4556D	
IC600,601	263 0553 006	NJM7805FA	
IC602	263 0501 003	NJM79M05FA	
IC603,604	268 0073 905	ICP-N15T	
IC605	269 0096 008	HFBR1550	
IC700	262 0655 008	HD74HC02P	
IC701	262 0594 004	HD74HC74P	
TR101	272 0025 907	2SB562(C)TF	
TR113,390	269 0025 901	RN1202 (10K-10K)	
TR311~320 511,512	273 0253 918	2SC2878 (A/B)	
TR391	269 0026 900	RN2202 (10K-10K)	
TR501,600	271 0101 925	2SA933(Q)T-70	
TR601	271 0102 908	2SA1015 (Y)	
D201~208	276 0049 914	1S2076ATE	
D305	276 0417 915	1SS270ATE	
D600~609	276 0552 906	1SR139-200T-32	
D610	276 0501 928	HZ33L-3TD	
D611	276 0051 973	HZ7C-2TE	
RESISTOR GROUP			
VR101,102 104	211 6077 912	V06PB203	20kΩ
VR103	211 6077 925	V06PB103	10kΩ
VR105	211 6077 909	V06PB102	1kΩ
VR401,402	211 6077 938	V06PB104	100kΩ
R509~512	241 2414 020	RD14B2H181(J)(PSN-B)	1/2W 180Ω
★	211 0630 003	V1620V20 PB203M	20kΩ Variable
CAPACITOR GROUP			
(Ceramic)			
C103	253 3614 000	CC45SL1H300J	30pF/50V
C105,106 140,302	253 3603 008	CC45SL1H100D	10pF/50V
C120	253 1055 014	CK45B1H561K	560pF/50V
C128,146 650	253 1024 003	CK45F1H103Z	0.01μF/50V
C129,200 201, 300~304 401,402 608	253 9036 006	CK45=1E104Z	0.1μF/25V
C130,147 214	253 1004 007	CK45B1H102K	1000pF/50V
C136,143	253 3627 000	CC45SL1H101J	100pF/50V

● Part indicated with the mark "◆ " is substitute.

Ref. No.	Part No.	Part Name	Remarks
C148	253 1001 000	CK45B1H331K	330pF/50V
C210,211	253 4342 041	CC45SL1H050C	5pF/50V
(Electrolytic)			
C101,150 151,609	254 4260 061	CE04W1H3R3M	3.3µF/50V
C104	254 4254 048	CE04W1C101M	100µF/16V
C115,197	254 4260 016	CE04W1HR22M	0.22µF/50V
C117	254 4260 029	CE04W1HR33M	0.33µF/50V
C126	254 4337 910	CE04W1H6R8M	6.8µF/50V
C131	254 4260 045	CE04W1H010M	1µF/50V
C132	254 4254 019	CE04W1C220M	22µF/16V
C141	254 3055 905	CE04D1V4R7MBP	4.7µF/35V
C390	254 4254 051	CE04W1C221M	220µF/16V
C459~462	254 4289 738	CE04W1H101M (AWF)	100µF/50V
C479~482	254 4356 014	CE04W1H101M (ARS)	100µF/50V
C483~486	254 4325 744	CE04W1H3R3M (AXF)	3.3µF/50V
C487,488	254 4261 015	CE04W1H470M	47µF/50V
C489	254 4313 905	CE04W1H3R3M	3.3µF/50V
C491~494	254 4256 004	CE04W1E100M	10µF/25V
C551	254 4313 905	CE04W1H3R3M (AFS)	3.3µF/50V
C600,601	254 4289 783	CE04W1H222M 8AWF)	2200µF/50V
C602,603	254 4254 967	CE04W1C331M	330µF/16V
C604	254 4262 946	CE04W1J470M	47µF/63V
(Film)			
C102	255 1120 055	CQ93M1H272J	2700pF/50V
C113,121	255 1120 068	CQ93M1H332J	3300pF/50V
C114,116 122,134	255 1121 025	CQ93M1H103J	0.01µF/50V
C123	255 1120 042	CQ93M1H222J	2200pF/50V
C137	255 1120 000	CQ93M1H102J	1000pF/50V
C139	255 1120 097	CQ93M1H562J	5600pF/50V
C467,468	255 4232 018	CQ93P2A181J (NH)	180pF/100V
C471,472	255 4232 034	CQ93P2A102J (NH)	1000pF/100V
C473,474	255 4232 076	CQ93P2A201J (NH)	200pF/100V
C475,476	255 4235 756	CQ93P2A682J (NH)	6800pF/100V
C477,478	255 4232 063	CQ93P2A620J (NH)	62pF/100V
(Metalized)			
C110,125	256 1034 018	CF93A1H333J	0.033µF/50V
C124	256 1034 063	CF93A1H823J	0.082µF/50V
C127	256 1035 017	CF93A1H224J	0.22µF/50V
C135,142	256 1034 076	CF93A1H104J	0.1µF/50V
(Others)			
	204 8322 007	HEADPHONE JACK	
	204 8261 003	4P PIN JACK	
	212 4699 900	TACT SWITCH	
	393 4081 008	FIP10NM6	DISPLAY TUBE
	269 0096 008	HFBR 1550	OPTICAL OUTPUT TERMINAL

Ref. No.	Part No.	Part Name	Remarks
X300	399 0036 013	X'TAL (16.9344MHz)	
CB101	205 0343 087	8P CONN. BASE (KR-PH)	
CB102	205 0321 041	4P CONN. BASE	
CB103	205 0343 045	CONN. BASE (KR-PH)	
CB104	205 0323 036	3P CONN. BASE	
CB105	205 0343 032	3P CONN. BASE (KR-HP)	
CB106	205 0406 034	3P CONN. BASE (KR-HP)	
CB201	205 0321 038	3P CONN. BASE	
CB202	205 0543 036	3P CONN. BASE	
CB250,251	205 0549 001	31P FFC CONN. BASE	
CB500	205 0343 003	10P CONN. BASE (KR-RH)	
CB600	205 0343 061	6P CONN. BASE (KR-PH)	
CC250	009 0011 009	31P FFC CABLE	
CC501	204 2329 006	10P SAN-PH CONN. CORD	

POWER SUPPLY UNIT (2U-1879/2U-2023)

Ref. No.	Part No.	Part Name	Remarks
⚠	233 5794 005	POWER TRANSFORMER (E2)	Europe, U.K.
⚠	233 5795 004	POWER TRANSFORMAER (EU)	U.S.A. Canada
⚠	233 5796 003	POWER TRANSFORMER (EA)	Australia
⚠	212 4697 009	POWER SWITCH	
⚠	253 8014 702	CK45F2GAC103MC	0.01µF/400VAC
⚠C900	204 0223 007	6P SAN-PH CORD	

• **Resistors**

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

RD : Carbon RC : Fixed RS : Metallic film RW : Winding RN : Metal film RK : Metal mixture	2B : ⅛W 2E : ¼W 2H : ½W 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 : 1800Ω = 1.8kΩ
- Indicates number of zeros after effective number
- 2-digit effective number, decimal point indicated by R.
- Units: Ω

• **Capacitors**

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

CE : Aluminum foil electrolyte CA : Aluminum solid electrolyte CS : Tantalum electrolyte 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
2 R 2 : 2.2µF
- 1-digit effective number, decimal point indicated by R.
- 2-digit effective number, decimal point indicated by R.

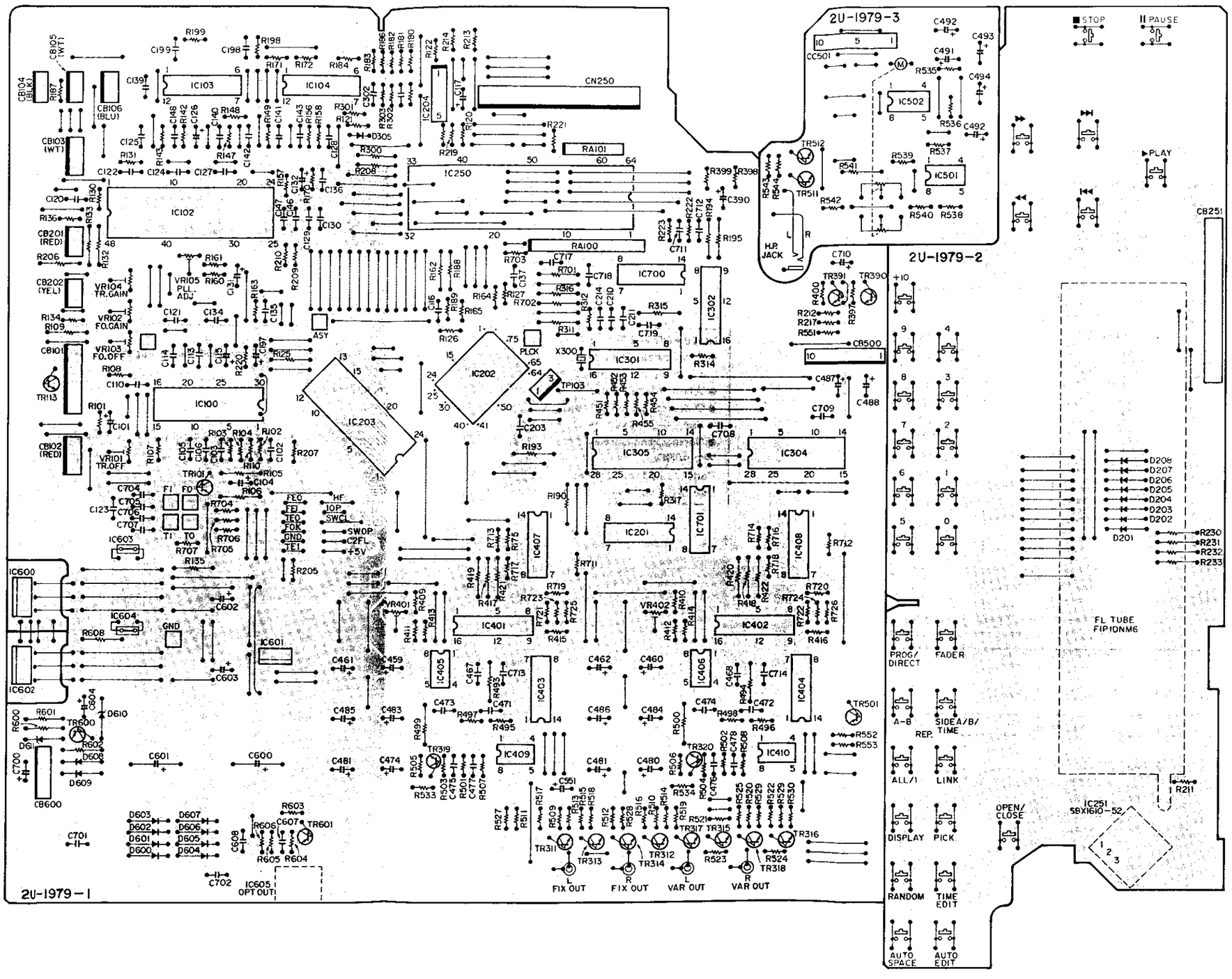
• Units: µF, (for P, pF (µµF)
• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

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 "I" (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.

P.W.BOARD

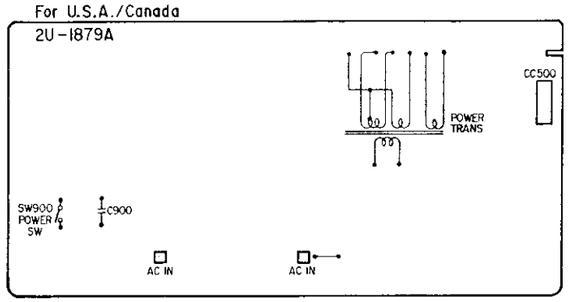
2U-1979/2U-2022/2U-2080 SIG. AUDIO UNIT



2U-1879/2U-2023 POWER SUPPLY UNIT

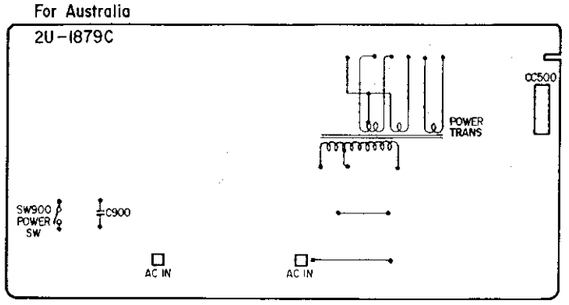
For U.S.A./Canada

2U-1879A



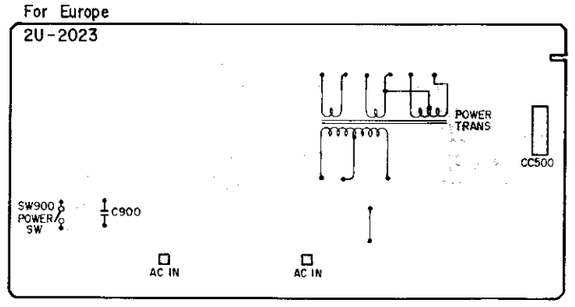
For Australia

2U-1879C



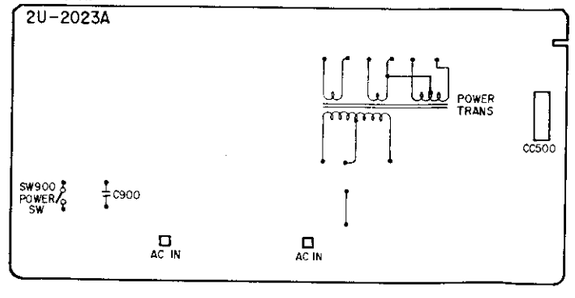
For Europe

2U-2023



For U.K.

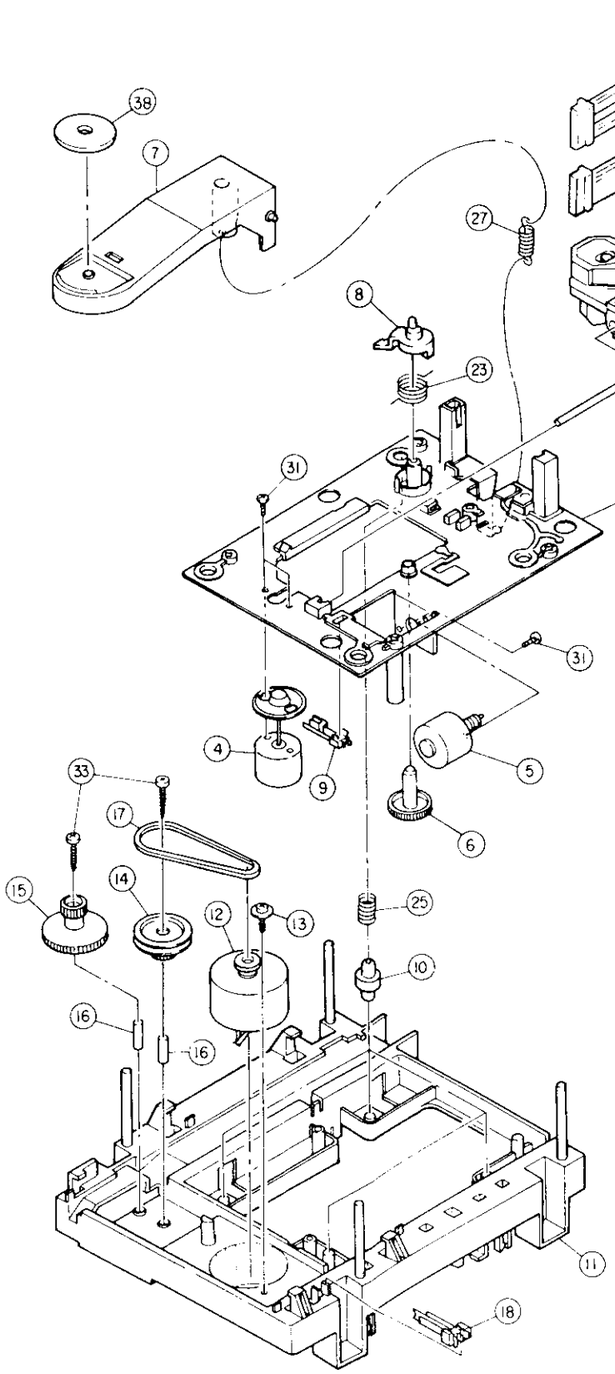
2U-2023A



PARTS LIST OF FG-412 MECHA UNIT

Ref. No.	Part No.	Part Name	Remarks
1	411 0783 501	PU MECHA BASE	
2	431 0262 000	PU SLIDE SHAFT	
3	499 0100 003	LASER PU	(KSS-150A)
4	GEN-0702	SPINDLE M. SUB ASS'Y	
5	PSO2A09	SLIDE M. SUB ASS'Y	
6	424 0127 105	HELICAL GEAR	
7	433 0505 307	CLAMP ARM ASS'Y	
8	424 0129 404	CLAMPER CAM	
9	212 4696 000	LEAF SW (PU)	
10	426 0078 104	DAMPER	
11	411 0789 505	MECHA BASE	
12	PLO1A49	LOADING MOTOR SUB ASS'Y	
13	477 0262 006	SPECIAL SCREW	
14	424 0130 008	PULLEY GEAR	
15	424 0131 007	GEAR	
16	443 0799 000	COLLAR	
17	423 0050 004	BELT	
18	212 4613 009	LEAF SW (O/C)	
23	463 0585 001	C.L.C. SPRING	
25	463 0583 100	SPRING (F)	
27	463 0573 000	CLAMPER SPRING	
31	471 3801 039	3x3 CBS-Z	
34	473 3808 009	3x25 CBTS (I)	
36	204 2159 069	8P PH CONNE WIRE	P.U. WIRE
37	204 2282 004	8P-4P 4P, PH CORD (RED) (4px2)	P.U. WIRE
38	461 0448 003	DAMP SHEET	

EXPLODED VIEW OF FG-412 MECHANISM UNIT



PARTS LIST OF EXPLODED VIEW

Europe and U.K. Models

Ref. No.	Part No.	Part Name	Remarks
⊙ 1	411 0947 101	CHASSIS	
◆	411 0884 316	CHASSIS	
⊙ 2	105 0890 201	BACK PANEL	
◆	105 0879 002	BACK PANEL	
⊙ 3	103 1192 106	PIN JACK HOLDER	
⊙ 4	105 0891 103	BOTTOM COVER	
◆	105 0814 504	BOTTOM COVER	
⊙ 6	2U-2022	SIG. AUDIO UNIT	
⊙⚠7	**2U-2023**	**POWER SUPPLY UNIT**	
⚠8	**233 5794 005**	**POWER TRANSFORMER**	
⚠9	**206 2073 002**	**AC CORD**	
◆	206 2061 001	AC CORD	
◆	206 2024 006	AC CORD WITH LABEL	
⚠10	**445 0056 008**	**CORD BUSH**	
12	113 1067 254	P.SW. LEVER ASS'Y	(Gold)
	113 1067 267	P.SW. LEVER ASS'Y	
⊙ 13	FG-415	CD MECHA UNIT	
14	463 0584 002	SPRING PLATE	
⚠15	**212 4697 009**	**POWER SWITCH**	
16	435 0113 009	LACH (Y3Y18)	
17	112 0572 116	VOLUME KNOB	(Gold)
	112 0572 103	VOLUME KNOB	
18	GEN 0947-1	FRONT PANEL ASS'Y	(Gold)
	GEN 0947	FRONT PANEL ASS'Y	
19	144 1946 230	FRONT PANEL	(Gold)
	144 1946 227	FRONT PANEL	
20	146 1128 119	SUB PANEL ASS'Y	(Gold)
◆	146 1103 302	SUB PANEL ASS'Y	
	146 1128 106	SUB PANEL ASS'Y	
21	113 1223 043	SERIES KNOB (12)	(Gold)
	113 1223 027	SERIES KNOB (12)	
22	113 1223 056	SERIES KNOB (11)	(Gold)
	113 1223 030	SERIES KNOB (11)	
23	113 1224 123	FUNCTION KNOB (A)	(Gold)
	113 1224 110	FUNCTION KNOB (A)	
24	113 1298 227	OP/CL KNOB	(Gold)
	113 1298 214	OP/CL KNOB	
25	113 1299 022	MANUAL SEARCH KNOB	(Gold)
	113 1299 019	MANUAL SEARCH KNOB	
⊙ 26	102 0414 112	TOP COVER	(Gold)
⊙	102 0408 212	TOP COVER	
	102 0414 109	TOP COVER	
28	146 0772 016	TOP COVER WASHER	(Gold)
	146 0772 003	TOP COVER WASHER	
29	009 0011 009	31P FFC CABLE	
30	393 4081 008	FIP 10NM6	FL TUBE
31	204 8322 007	HEAD PHONE JACK	
32	211 0636 003	V1620V20FB203M	H/P VOL
33	269 0096 008	HFBR1550 (OPT-OUT)	OPTICAL OUT
35	204 8261 003	4P PIN JACK	ANALOG OUT
36	204 8256 005	1P PIN JACK	
37	144 1955 030	TRAP DOOR	(Gold)
	144 1955 027	TRAP DOOR	
38	401 0162 222	HINGE (LEFT)	(Gold)
	401 0162 219	HINGE (LEFT)	
39	401 0161 223	HINGE (RIGHT)	(Gold)
	401 0162 210	HINGE (RIGHT)	
40	GEN 0198H	LOADER FRAME SUB ASS'Y	
41	431 0264 613	LOADER FRAME	
42	122 0165 119	HIMERON SHEET	
43	122 0164 013	HIMERON SHEET	
44	435 0110 303	RACK	
45	463 0574 009	DISC TRAY SPRING	
46	431 0284 130	DISC TRAY ASS'Y	
47	129 0133 003	SHOCK SHEET	
48	129 0155 104	RUBBER SHEET	
⊙ 49	412 2982 002	MECHA FIX BRACKET	

Ref. No.	Part No.	Part Name	Remarks
50	412 2983 108	TOP PLATE	
◆	412 2882 005	TOP PLATE	
51	122 0181 009	SOUND RUBBER	
57	144 1892 436	LOADER PANEL ASS'Y	(Gold)
	144 1892 423	LOADER PANEL ASS'Y	
58	104 0228 100	FOOT ASS'Y	
64	129 0152 107	ARM DAMPER	
70	499 0150 008	SBX1610-52	OPTICAL SENSOR
71	212 5604 910	TACT SWITCH-TA	
72	205 0549 001	31P FFC CON BASE	
⊙ 75	412 2874 000	TRANS. SUPPORT PLATE	
101	473 7002 021	3×8 CBTS (S)-B	
102	473 7508 017	3×10 CBTS (P)-B	
103	473 7500 015	3×8 CBTS (P)-Z	
104	471 9020 005	SPECIAL SCREW	(Gold)
105	473 4454 025	4×8 CTTS (2)-B	
106	473 3806 014	3×8 CBTS (2)-N	(Gold)
	473 7002 021	3×8 CBTS (S)-B	
104	471 9020 018	SPECIAL SCREW	
105	473 4801 005	4×8 CTTS	(Gold)

- Parts marked with ⚠ and/or shading have special characteristics important to safety.
  Be sure to use the specified parts for replacement.
- 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.
- (Gold) in the Remarks column refers to models with Gold front panels.
- Part indicated with the mark "◆ " is substitute.

PARTS LIST OF PACKING & ACCESSORIES

Europe, U.K. Models

Ref. No.	Part No.	Part Name	remarks
	504 0125 005	STYRENE PAPER	
	504 0092 060	STYRENE PAPER	
◆	505 0131 050	CABINET COVER	
	503 0861 007	CUSHION	
◆	503 0794 006	CUSHION	
	501 1428 003	CARTON CASE	
	513 9111 001	COLOR LABEL	(Gold)
	505 0178 000	POLY COVER	
◆	505 0038 030	POLY COVER	
	511 1950 002	INST. MANUAL	
	203 2223 002	2P PIN CORD	
	499 0156 002	RC-225	
◆	499 0141 004	RC-221	
	GEN 0355	CONT. CARD (L) SUB ASS'Y	
	513 1389 006	CONTROL CARD BASE	
	513 1349 004	THERMAL CARBON FILM	
	502 0736 003	PROTECTOR	
	513 0985 003	INST LABEL	Europe
	513 8294 000	VDE LABEL	Europe
	513 8253 009	APPROVAL MARK	Europe

PARTS LIST OF EXPLODED VIEW

U.S.A., Canada and Australia Models

Ref. No.	Part No.	Part Name	Remarks
⊙ 1	411 0084 316	CHASSIS	
⊙ 2	105 0879 002	BACK PANEL	
⊙ 3	103 1192 106	PIN JACK HOLDER	
⊙ 4	105 0814 504	BOTTOM COVER	
⊙ 6	2U-2080	SIG. AUDIO UNIT	U .S.A., Canada
⊙	2U-1479	SIG. AUDIO UNIT	Australia
⊙⚠7	**2U-1879A**	**POWER SUPPLY UNIT**	**U.S.A., Canada**
⊙⚠	**2U-1879C**	**POWER SUPPLY UNIT**	**Australia**
⚠8	**233 5795 004**	**POWER TRANSFORMER**	**U.S.A., Canada**
⚠	**233 5796 003**	**POWER TRANSFORMER**	**Australia**
⚠9	**206 5795 004**	**AC CORD**	**U.S.A., Canada**
⚠	**206 2025 005**	**AC CORD**	**Australia**
⚠10	**445 0056 008**	**CORD BUSH**	
12	113 1067 238	P.SW. LEVER ASS'Y	
⊙ 13	FG-412	CD MECHA UNIT	
14	463 0584 002	SPRING PLATE	
⚠15	**212 4697 009**	**POWER SWITCH**	
16	435 0113 009	LACH (Y3Y18)	
17	112 0572 103	VOLUME KNOB	
18	GEN 0832	FRONT PANEL ASS'Y	
19	144 1946 227	FRONT PANEL	
20	146 1103 202	SUB PANEL ASS'Y	
21	113 1223 027	SERIES KNOB (12)	
22	113 1223 030	SERIES KNOB (11)	
23	113 1224 110	FUNCTION KNOB (A)	
24	113 1298 214	OP/CL KNOB	
⊙ 25	102 0408 212	TOP COVER	
28	146 0772 003	TOP COVER WASHER	
29	009 0011 009	31P FFC CABLE	
30	393 4081 008	FIP 10NM6	FL TUBE
31	204 8322 007	HEAD PHONE JACK	
32	211 0636 003	V1620V20FB203M	H/P VOL
33	269 0096 008	HFBR1550 (OPT-OUT)	OPTICAL OUT
35	204 8261 003	4P PIN JACK	ANALOG OUT
36	204 8256 005	1P PIN JACK	
37	144 1955 027	TRAP DOOR	
38	401 0162 219	HINGE (LEFT)	
39	401 0161 210	HINGE (RIGHT)	
40	GEN 0198 H	LOADER FRAME SUB ASS'Y	
41	431 0264 600	LOADER FRAME	
42	122 0165 114	HIMERON SHEET	
43	122 0164 013	HIMERON SHEET	
44	435 0110 303	RACK	
45	463 0574 009	DISC TRAY SPRING	
46	431 0284 101	DISC TRAY ASS'Y	
47	129 0133 003	SHOCK SHEET	
48	129 0155 104	RUBBER SHEET	
⊙ 49	412 2812 305	MECHA. FIX BRACKET	
50	412 2882 005	TOP PLATE	
51	122 0181 009	SOUND RUBBER	
57	144 1892 436	LOADER PANEL ASS'Y	(Gold)
	144 1892 423	LOADER PANEL ASS'Y	
58	104 0228 100	FOOT ASS'Y	
64	129 0152 110	ARM DAMPER	
70	499 0150 008	SBX1610-52	OPTICAL SENSOR
71	212 4699 900	TACT SWITCH	
72	205 0549 001	31P FFC CONN. BASE	
⊙ 75	412 2874 000	TRANS. SUPPORT PLATE	

Ref. No.	Part No.	Part Name	Remarks
101	473 7002 021	3×8 CBTS (S)-B	
102	473 7508 017	3×10 CBTS (P)-B	
103	473 7500 015	3×8 CBTS (P)-Z	
104	471 9020 018	SPECIAL SCREW	
105	473 4454 025	4×8 CTTS (2)-B	
106	473 7002 021	3×8 CBTS (S)-B	

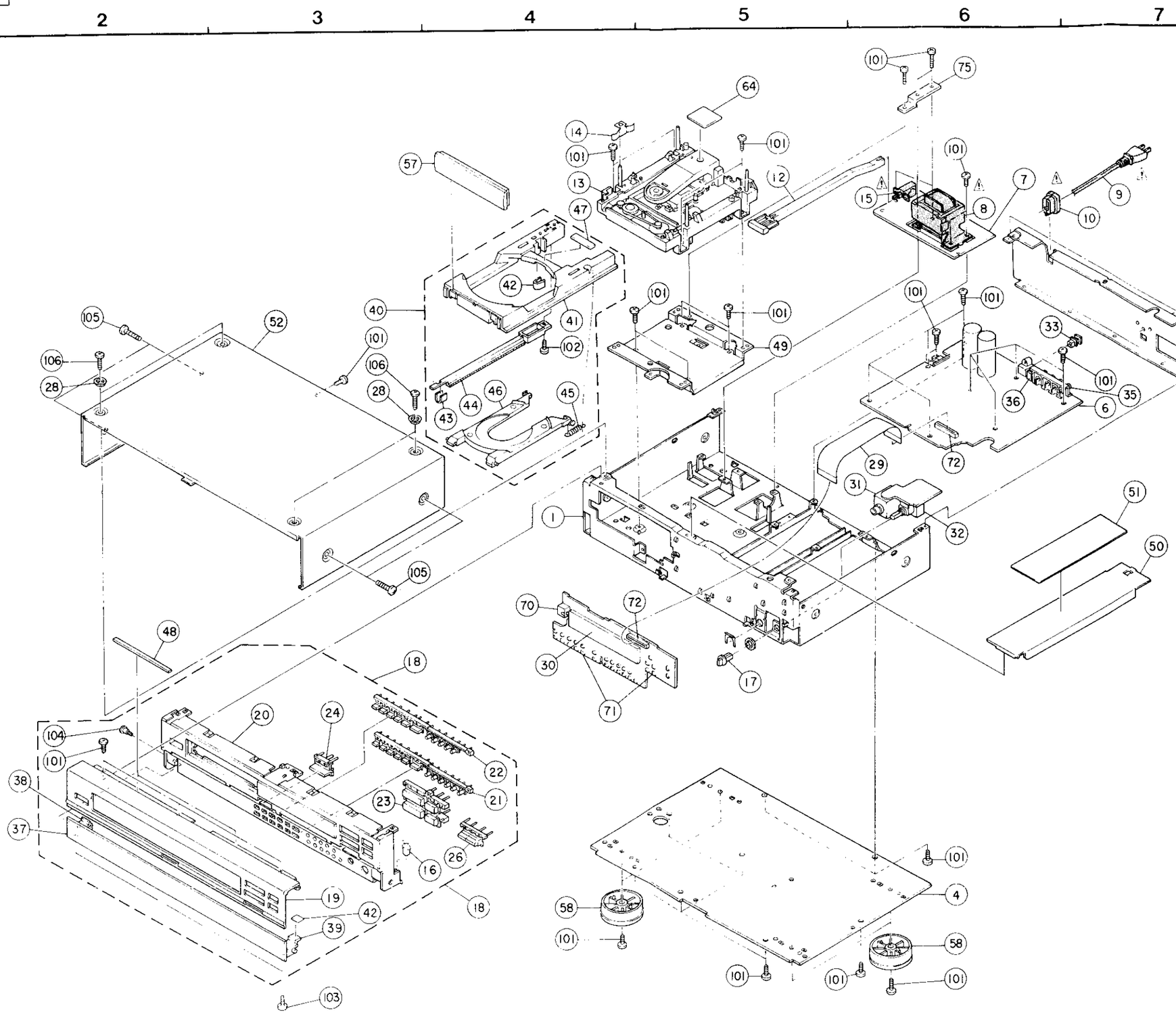
- Parts marked with ⚠ and/or shading have special characteristics important to safety.
  Be sure to use the specified parts for replacement.
- Part indicated with the mark "⊙" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of parts may be refused.

PARTS LIST OF PACKING & ACCESSORIES

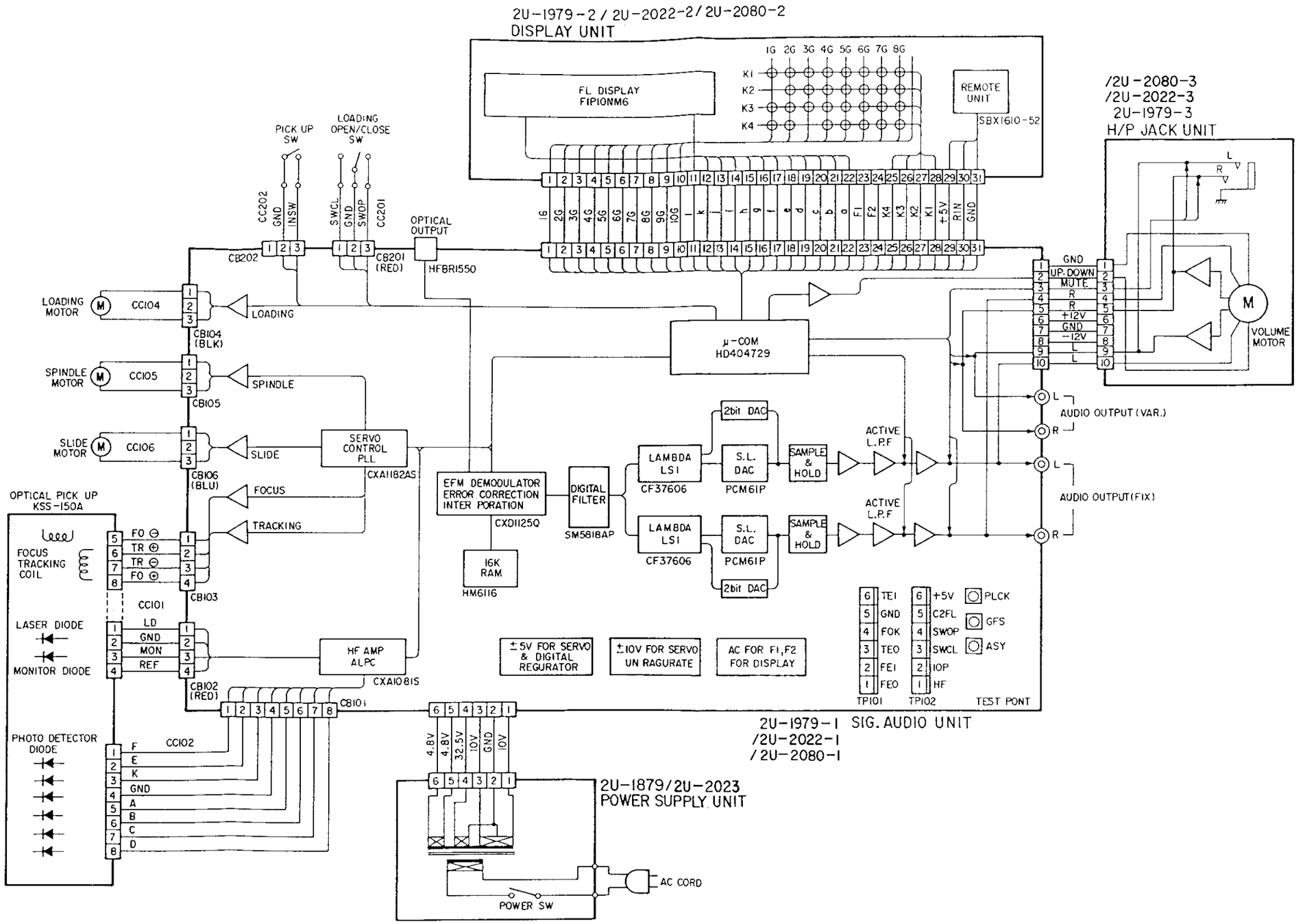
U.S.A, Canada, Australia Models

Ref. No.	Part No.	Part Name	Remarks
	504 0092 060	STYRENE PAPER	
	504 0102 092	STYRENE PAPER	
	503 0794 006	CUSHION	
	501 1408 036	CARTON CASE	
	505 0038 030	POLY COVER	
	511 1977 001	INST. MANUAL	
	204 8121 004	2P PIN CORD	
	499 0141 004	RC-221	
	513 1389 006	CONTROL CARD BASE	
	513 1349 004	THERMAL CARBON FILM	
	502 0736 003	PROTECTOR	
	515 0418 301	DAI WARRANTY HOME	U.S.A.
	513 1220 000	CAUTION LABEL	
	513 0209 019	NOTICE SHEET	Australia
	513 0985 003	INST. LABEL	Australia

EXPLODED VIEW

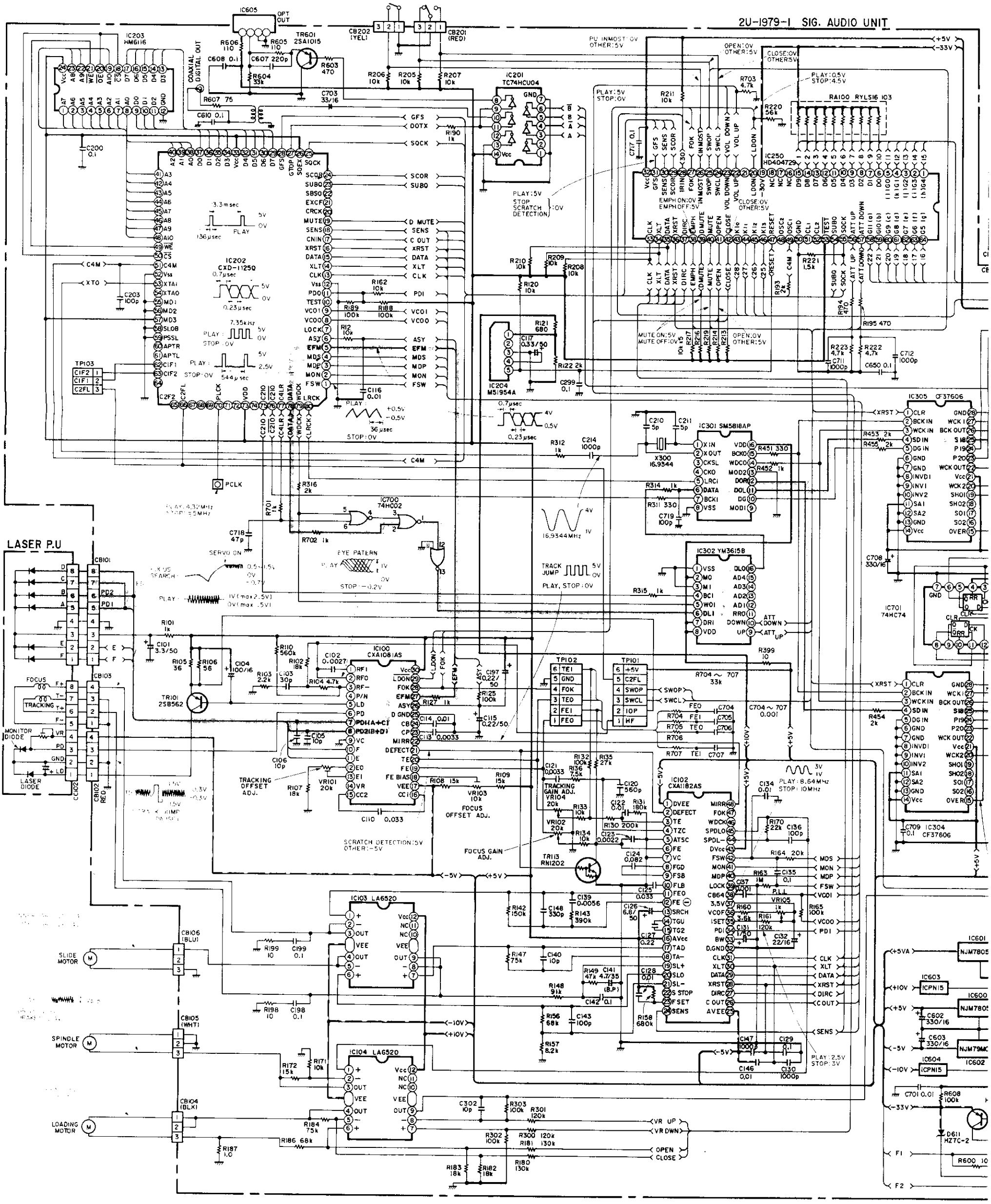


WIRING DIAGRAM



SCHEMATIC DIAGRAM

1 2 3 4 5 6



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

NOTES
ALL RESISTANCE VALUES IN OHM. k=1,000 OHM. M=1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD. P=MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

AUDIO UNIT

2U-1979-2 DISPLAY UNIT

D201~208 IS2076A

RANDOM OP/CL AUTO EDIT AUTO SPACE 1 2 3 FADER
PICK ALL/1 A-B 4 5 6 LINK
STOP 7 8 9 TIME EDIT
PLAY TIME SIDE A/B PAUSE 10 +10 PROG/DIRECT DISPLAY

REMOTE UNIT IC251 SBX1610-52

CB251 CB250

IC305 CF37606 IC407 74HC00 IC403 HC4066 IC409 BA15218 IC410 BA15218
IC401 PCM61P IC402 PCM61P IC405 µPC4570 IC406 µPC4570
IC701 74HC74 IC408 74HC00 IC404 HC4066

TR311~314 2SC2878 TR315~318 2SC2878 TR319 2SC2878 TR320 2SC2878
TR501 2SA933 TR390 RN1202 TR391 RN2202

L FIX OUT R FIX OUT L VAR OUT R VAR OUT

CB500

2U-1979-3 H/P JACK UNIT

CC501 IC501 NJM4556D IC502 BA15218 TR511,512 2SC2878

IC601 NJM7805FA IC602 NJM79M05FA IC603 ICPN15 IC604 ICPN15

D600~603 ISR139 D604~607

U.S.A., Canada Models
2U-1879A POWER SUPPLY UNIT
AC120V 50/60Hz

Australia Model
2U-1879C POWER SUPPLY UNIT
AC240V 50/60Hz

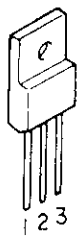
Europe Model
2U-2023 POWER SUPPLY UNIT
AC220V 50/60Hz

U.K. Model
2U-2023A POWER SUPPLY UNIT
AC240V 50/60Hz

NOTE :
+B LINE
−B LINE
SIGNAL LINE
"JV" IS JUMPER WIRE ON P.W.B.

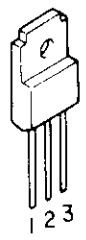
SEMICONDUCTORS

- IC's



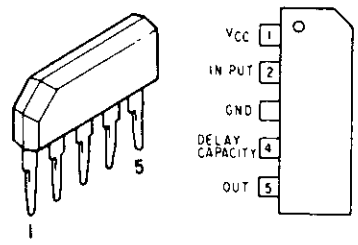
1. Input
2. GND
3. Output

NJM7805FA

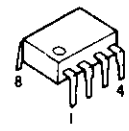


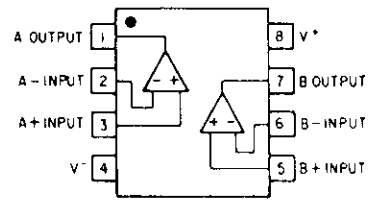
1. Gnd
2. Output
3. Input

NJM79M05FA

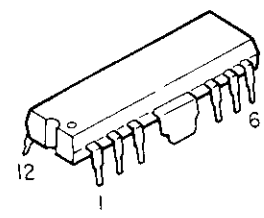


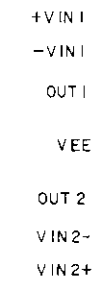
M51954B



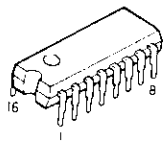


NJM4556D
μPC4570C
BA15218

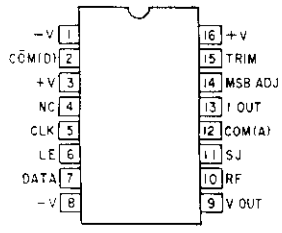




LA6520



SM5818AP
PCM61P



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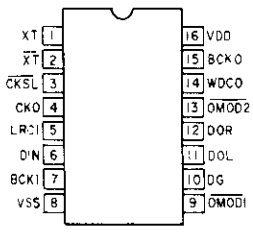

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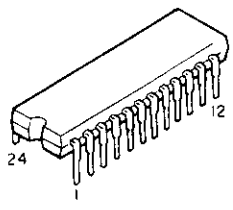
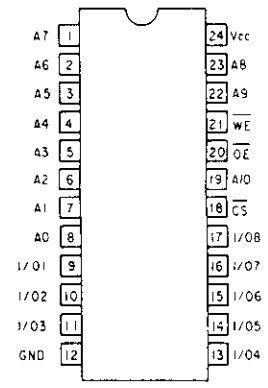
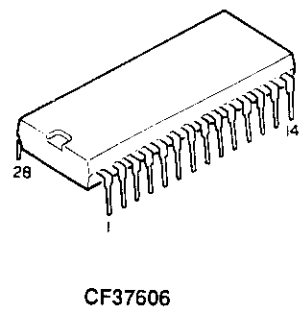
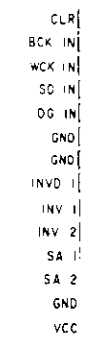




HM6116P/LP4/3/2





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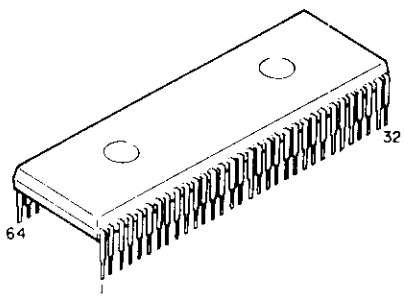

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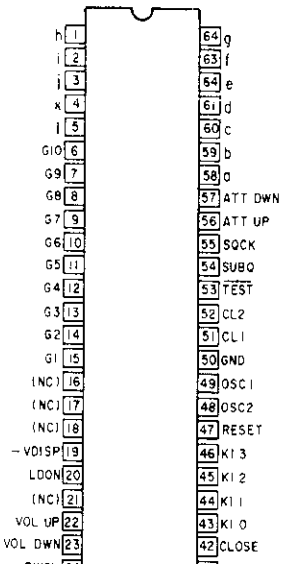
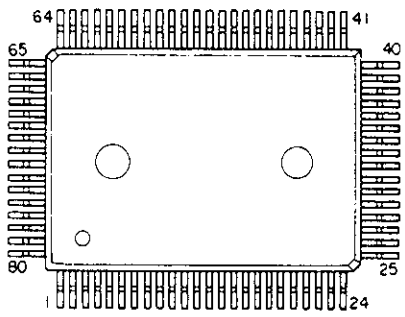
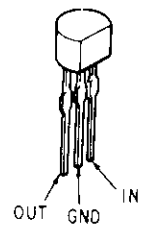




CXD1125Q



NJM78L05A

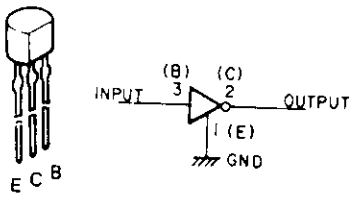
- IC PROTECTOR

ICP-F15

- TRANSISTORS

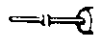
2SA933(Q)
2SC2878(A/B)
2SA1015(Y)

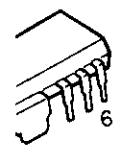
2SB562(C)



RN1202(10K-10K)NPN
RN2202(10K-10K)PNP

- DIODES





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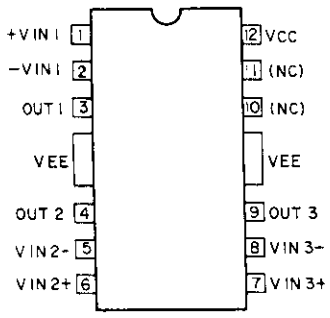
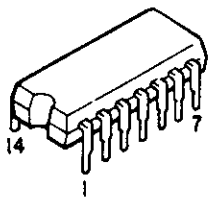
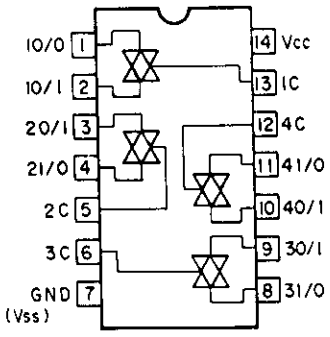




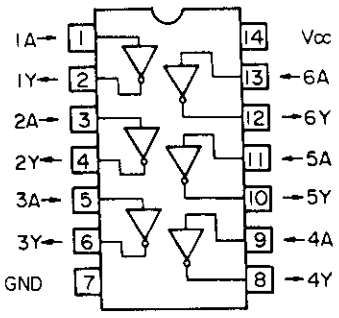
TC74HC4066
TC74HCU04P
HD74HC00P
HD74HC74P

TC74HC4066



(TOP VIEW)

TC74HCU04P



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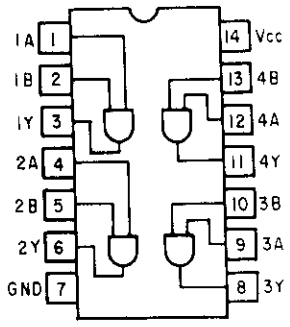

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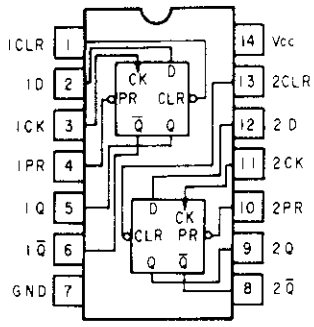

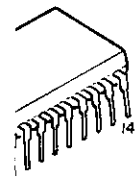

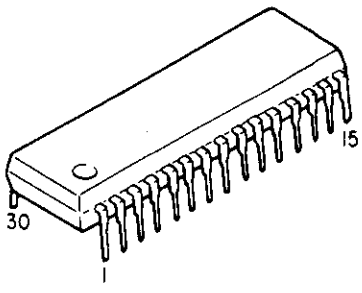

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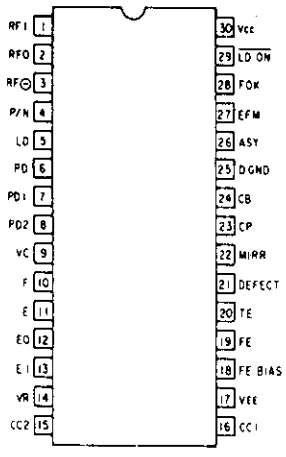

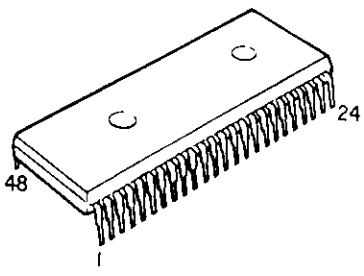

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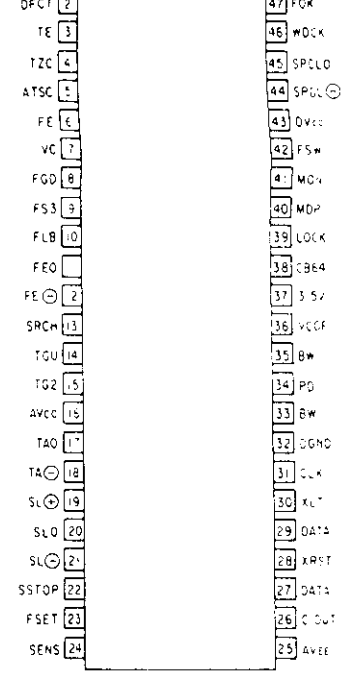
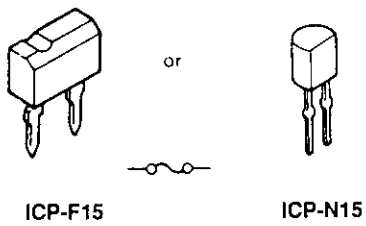


• IC PROTECTOR



ICP-F15 ICP-N15

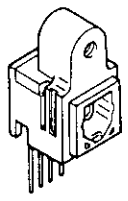
• DIODES

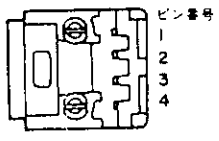
1S2076A
1SS270A
1SR35-200A

HZ7C-2
HZ33L-3

• INTERFACE

- HFBR-1550: Optical Transmitter
- HFBR-2250: Optical Receiver





Pin No.	HFBR-1550	HFBR-2550
1	LED Anode	Vccd
2	LED Cathode	Vout
3	N.C.	GRD
4	N.C.	Vcca