

CDU948S

CD-R Drive Unit

CDU948S

CD-R Drive Unit

User's Guide

User's Guide

Owner's Record

The model and serial numbers are located on the bottom of the drive. Record these numbers in the spaces provided below. Refer to them whenever you call upon your sales representative regarding this product.

Model No. _____

Serial No. _____

Safety Regulations

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

CAUTION

As the laser beam in this CDU948S is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

The use of optical instruments with this product will increase eye hazard.

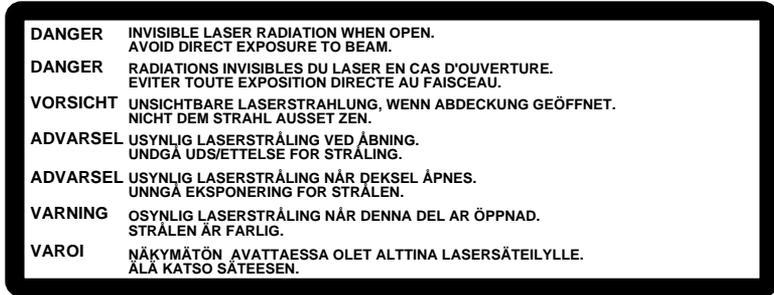
The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation.



DANGER
INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.
VORSICHT
UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG
GEÖFFNET
NICHT DEM STRAHL AUSSETZEN.

This label is located on the drive unit's internal chassis.

Dieses Etikett befindet sich auf dem inneren Chassis des Laufwerkes.



DANGER INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.
DANGER RADIATIONS INVISIBLES DU LASER EN CAS D'OUVERTURE.
EVITER TOUTE EXPOSITION DIRECTE AU FAISCEAU.
VORSICHT UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET.
NICHT DEM STRAHL AUSSETZEN.
ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING.
UNDGÅ UDSÆTTELSE FOR STRÅLING.
ADVARSEL USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES.
UNNGÅ EKSPONERING FOR STRÅLEN.
VARNING OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD.
STRÅLEN ÄR FARLIG.
VARO! NÄKYMÄTÖN AVATTAESSA OLET ALLTINA LASERSÄTEILYLLE.
ÄLÄ KATSO SÄTEESÄN.

This label is located on the bottom of the drive unit enclosure.

Dieses Etikett befindet sich am Boden des Laufwerksgehäuses.

이 기기는 가정용으로 전자파 적합등록을 한 기기로서
주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

This unit uses CD-R discs with the following mark.



This unit uses CD-ROM discs with the following mark.



When you use this unit as a CD player, use compact discs with the following mark.



WARNING — For the customers in U.S.A.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CLASS 1
LASER PRODUCT

LASER KLASSE 1
PRODUKT

This CD-R drive unit is classified as a CLASS 1 LASER PRODUCT.
The CLASS 1 LASER PRODUCT label is located at the bottom of the enclosure.

Bei diesem CD-R-Laufwerk Serie handelt es sich um ein Laser-Produkt der Klasse 1. Dieses Etikett befindet sich am Boden des Laufwerksgehäuses.

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Introduction

The CDU948S is a drive unit for CD-R discs, which stores a maximum of 650 Mbytes of digital data.

The drive unit has the following features:

- Reads and writes data in each CD-ROM, CD-ROM XA and Multi-Session standard formats.
- Reads standard CD-DA (“Red Book”) encoded discs, and reads and writes CD-R discs conforming to “Orange Book Part II.”
- Supports the following write modes: Disc at once, Session at once, Track at once, Variable packet, Fixed packet and Multisession.
- Outputs the audio as 16-bit digital data over the SCSI interface.
- Supports read and write operation at each standard speed, double speed and quadruple speed, and read-only operation at eightfold speed.

Supports real time error correction at all speeds.

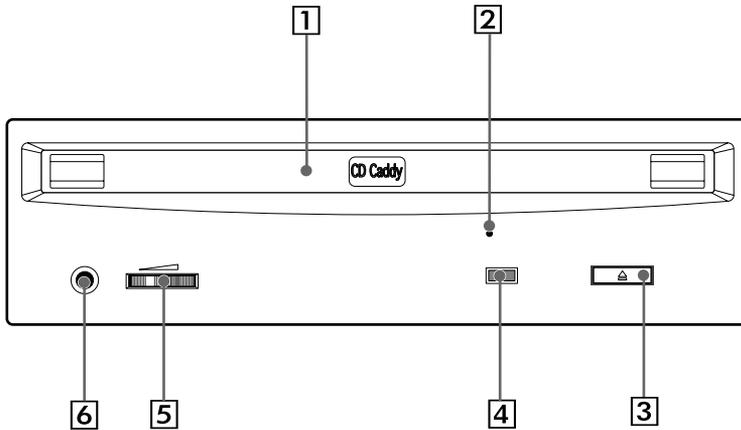
- 5 1/4 inch half-height drive form factor.
- SCSI bus interface embedded. (Based on SCSI-2)
- 2 MB buffer memory.
- Capable of audio CD playback provided with audio line output and headphones jack.
- Fast access time assures high-speed reading and writing operations.
- CD caddy for disc protection.
- Power loading and power eject.
- Emergency eject function which allows the caddy to be ejected manually.
- Capable of real time layered error correction.
- Employs a casing with an airtight frame.

■ Software requirement

Install the appropriate application software before using this unit.

Location and Function of Parts and Controls

Front Panel



1 Caddy insertion slot

Accepts a caddy loaded with a CD-ROM or CD-R disc.

2 Emergency eject hole

Insert a fine rod into this hole to eject a caddy manually in emergencies.

3 Eject button

Ejects the caddy from the drive unit.

4 Busy indicator

This indicator shows the unit's status in various phases of operation.

* Seek, read and write: Flashes amber

* Error: Lights up amber and stays lit

When the power is turned on, the indicator lights up green.

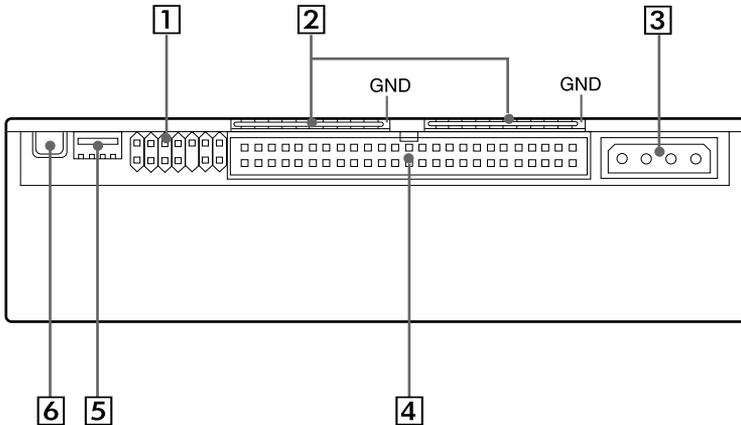
5 Volume control

Controls the volume of the analog audio output provided via a headphones jack.

6 Headphones jack

Provides two channel analog audio output.

Rear Panel



1 Jumper block for SCSI bus

Specify assignment of the SCSI bus.

2 Terminators

The terminator resistors are inserted into the sockets. Remove the resistors when the SCSI bus is to be terminated externally.

Note:

Some models are shipped without terminators.

When installing the terminators, orient them so that the GND pin (the end marked with a dot) is toward the right side of the socket.

3 Power-in connector

Connect to the power supply of the host computer.

4 SCSI bus interface connector

Connect to a SCSI host adapter using a connecting cable.

5 Audio output connector

Outputs analog audio signals.

See page 14 for detail.

6 Frame ground tab

Connect to one of the host computer's ground cables when the drive frame is not in direct contact with the computer.

Precautions

■ Installation

- Avoid placing the drive in a location subject to:
 - high humidity
 - high temperature
 - excessive dust
 - mechanical vibration
 - direct sunlight.

We recommend to use the drive in a horizontal position. Do not use it in a tilted position.

■ Operation

- Do not move the drive during operation. This may cause it to malfunction during reading or writing.
- Avoid exposing the drive to sudden changes in temperature as condensation may form on the lens inside the drive as a result. Should the surrounding temperature suddenly rise while the drive is on, wait at least one hour before you turn off the power. Operating the drive immediately after a sudden increase in temperature, may result in a malfunction during reading or writing.

■ Transportation

- Keep the original packing materials for future transport of the drive.
- Remove the caddy before moving the drive and, if you take the drive out of the computer, repack the drive as you received it.

Example of System Setup

To use the CD-R device, the following components are required:

- Computer (IBM-PC/AT* compatible)
- SCSI-Host adapter
- SCSI-Interface cable (50 to 50 pin flat cable)
- Software (Device driver, utilities)

* IBM-PC/AT is a registered trademark of International Business Machines Corporation.

Installing the Drive Unit into the Computer

As you go through this section, you may wish to refer to your computer's manual for a more detailed description of how to install internal drives.

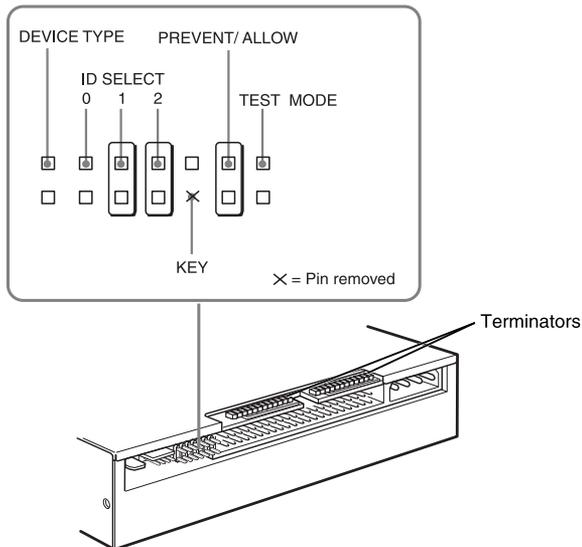
Getting Started

- Prepare the necessary parts and tools that have not been supplied:
 - Screwdriver
 - four screws 3 mm in diameter (Screws must not extend more than 4.0 mm into the side panels or the bottom plate.)
 - two mounting rails if your computer has mounting tracks.
- **Unplug the computer and disconnect the cables attached to the back for your own safety. Do not turn on the power of the computer before completing the entire installation process.**

Setting the Jumpers

Set the jumpers on the rear panel of the drive unit in accordance with the configuration of your computer system.

The jumpers are preset, as illustrated below, at the factory.



Remove the jumper to set to OFF, and install the jumper to set to ON. The recommended jumper is AMP* Shunts (14227-1), JAE** Short Socket (PS-2SH4-1) or equivalent.

The following table shows the function of each jumper.

Jumper	Function																																								
DEVICE TYPE	The setting of this jumper determines whether the SCSI device type code in the inquiry data is WO or CD-ROM. ON: WORM <input type="checkbox"/> OFF: CD-ROM																																								
ID SELECT	Assign the drive unit's ID number by setting these jumpers to ON or OFF. Do not assign the same number as one used for other SCSI device. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ID number</th> <th colspan="3">Jumper settings</th> </tr> <tr> <td></td> <th>0</th> <th>1</th> <th>2</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>1</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>2</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>3</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>4</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>5</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>6</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>7</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>	ID number	Jumper settings				0	1	2	0	OFF	OFF	OFF	1	ON	OFF	OFF	2	OFF	ON	OFF	3	ON	ON	OFF	4	OFF	OFF	ON	5	ON	OFF	ON	6	OFF	ON	ON	7	ON	ON	ON
ID number	Jumper settings																																								
	0	1	2																																						
0	OFF	OFF	OFF																																						
1	ON	OFF	OFF																																						
2	OFF	ON	OFF																																						
3	ON	ON	OFF																																						
4	OFF	OFF	ON																																						
5	ON	OFF	ON																																						
6	OFF	ON	ON																																						
7	ON	ON	ON																																						
KEY	Used to prevent the SCSI bus interface connector from being plugged in upside down.																																								
PREVENT/ALLOW	<input type="checkbox"/> ON: Allows insert and removal of a CD caddy with the eject button and the eject command. OFF: Prevents insert and removal of a CD caddy with the eject button or an eject command.																																								
TEST MODE	ON: Enables test mode. <input type="checkbox"/> OFF: Enables normal operation.																																								

Factory settings

Notes:

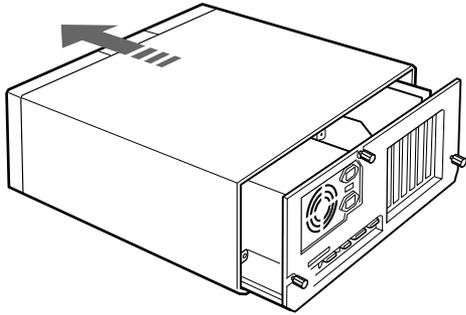
- The upper row of pins (without KEY position) is ground.
- ID SELECT, PREVENT/ALLOW, and TEST MODE are recognized when the power supply is turned on or SCSI bus is reset.
- TEST MODE is used exclusively for the factory testing. Do not set TEST MODE to ON. Doing so may cause an unexpected result.

* AMP is a registered trademark of AMP, Inc.

** JAE is a registered trademark of Japan Aviation Electronics Industry, Ltd.

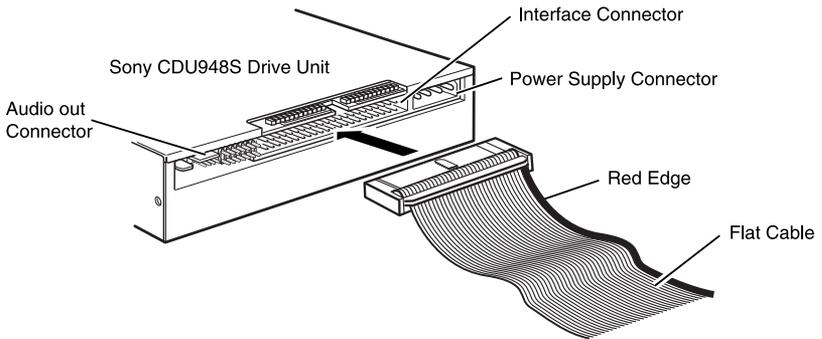
Opening the Computer

- 1** If your computer has its rear side covered by a plastic panel attached with plastic hook pad, pull it off.
- 2** Remove the cover mounting screws.
- 3** Remove the cover of the computer.



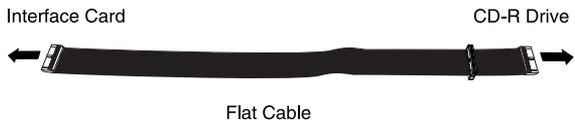
Connecting the Drive

Attach one end of the flat cable (SCSI cable) to the connector on the rear of the CD-R drive.



Note:

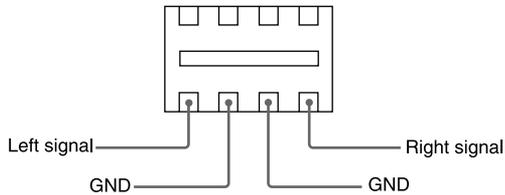
The red edge of the flat cable should be positioned next to the power supply connector. It is important that this cable be connected firmly and correctly.



■ Audio output connector

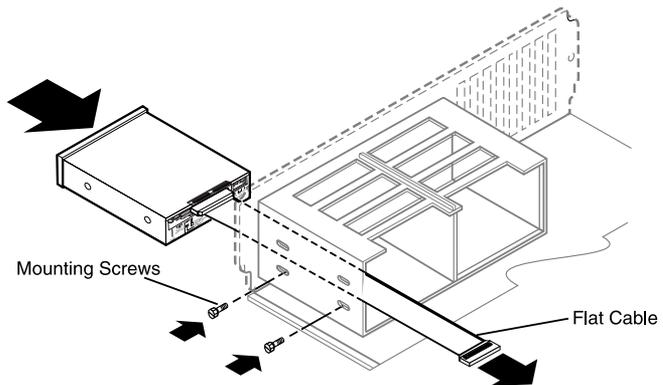
The audio output connector recommended is Molex 5159PBT contacts and 5051-04 housing or 5103 PBT contacts and 5102-04 housing.

Pin assignment



Mounting the Drive

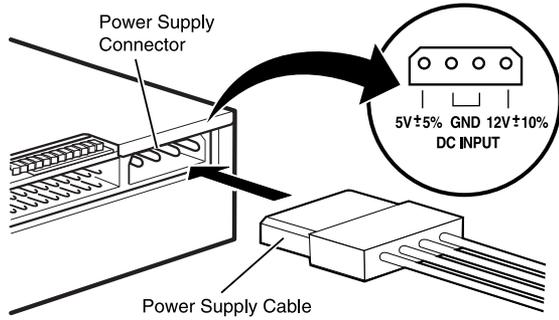
- 1 Route the flat cable through the drive bay from the front of the computer and insert the CD-R drive into the bay as shown. Secure the CD-R drive to the frame by using the prepared screws.



Note:

If you cannot secure the CD-R drive to the drive bay, you may need to install slide rails (not included) to the CD-R drive. Refer to your computer user's guide for additional information.

- 2 Locate an available power supply cable inside your computer and connect it to the power supply connector on the rear of the CD-R drive as shown.

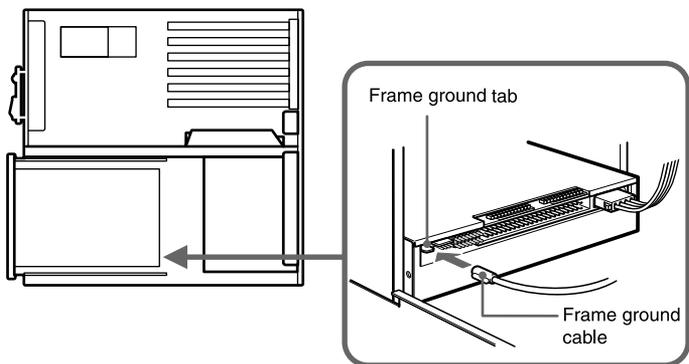


Caution:

Improper connection may damage the drive and void the warranty.

■ **Frame ground**

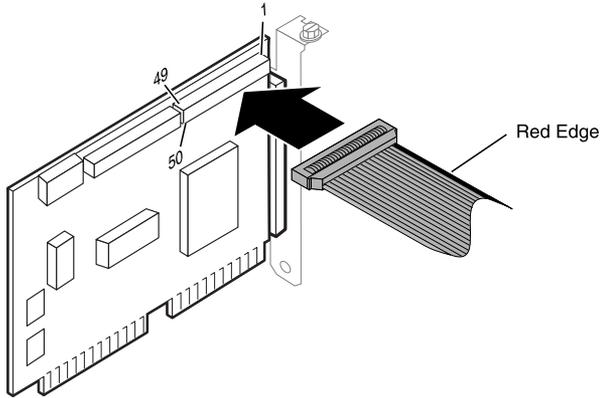
When normally installed, the drive unit is not in contact with the host computer directly and should be grounded. Connect the frame ground tab to one of the host computer's ground cables.



The frame ground cable recommended has a AMP 1-480435-0 housing and 170203-2 or 60711-1 contacts.

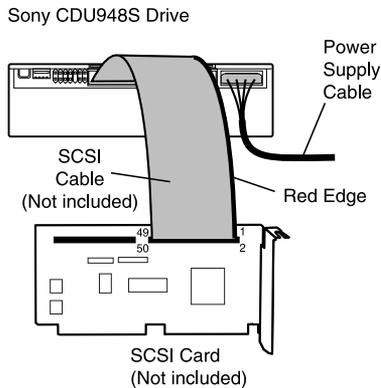
Host Adapter Installation

Connect the free end of the flat cable to the existing SCSI host adapter card and install the host adapter in the computer by inserting it securely in a system expansion slot. Refer to the operating instructions of the host adapter for complete instructions on its installation and the assignment of its switches.



Notes:

- The red edge of the flat cable must be closest to pin number 1 of the interface card connector.
- The following illustration is a sample system configuration of the Sony CDU948S CD-R drive installation with a SCSI card.

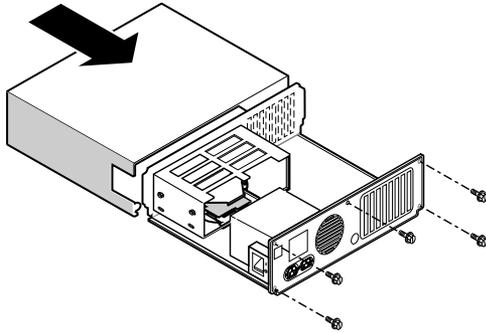


Termination

- If the CD-R drive is connected at the end of the SCSI chain, keep the drive terminator mounted at the drive.
- If the CD-R drive isn't the last device at the SCSI bus, remove the termination from the CD-R drive and make sure that the last device at the SCSI bus has a proper termination installed.
- Be aware that the SCSI bus needs to be terminated at each end of the SCSI bus cable.

Closing the Computer

- 1 Replace the cover on the computer, being careful to reinstall all screws that were removed.



- 2 Replace the AC power cord and turn on your computer.

Installing the Software Driver

MSCDEX and the device driver for an ordinary SCSI CD-ROM drive can be used when using the CDU948S as a SCSI CD-ROM drive.

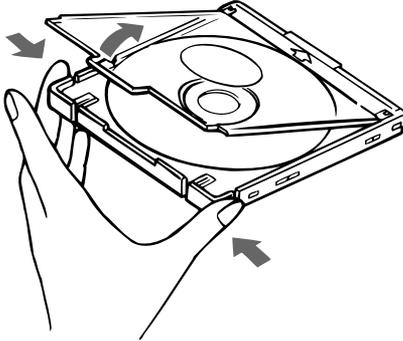
Use the device driver for a CD-R drive when using the CDU948S as a recordable drive.

Be sure to install the device driver before operating the drive. Refer to the manual supplied with the host adapter for instructions.

Using Discs and Caddies

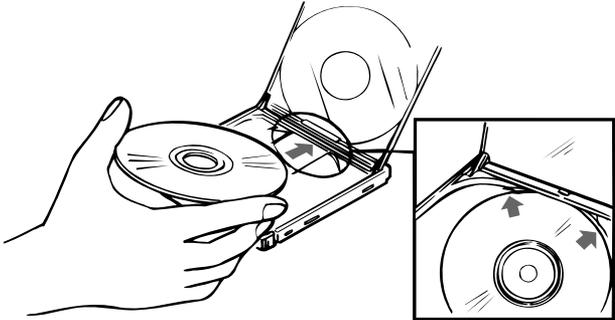
Loading a Caddy with a Disc

- 1 To open the caddy lid, press the tabs on the both sides of the caddy at the end opposite to the shutter.

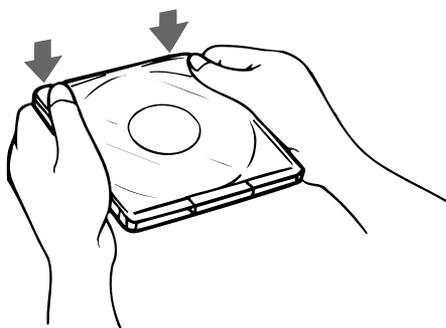


- 2 Set a disc, with its label upward, in the caddy.

Be careful not to touch the recording surface when setting a CD-R disc in the caddy. Data cannot be recorded if the recording surface is contaminated.

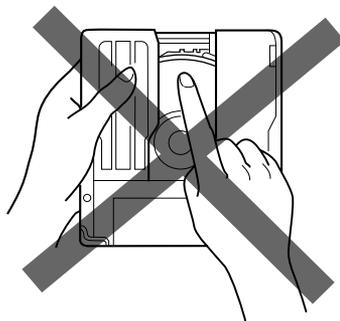


- 3** Close the lid firmly.



Important:

- Do not drop the disc or the caddy.
- The caddy is designed so that its shutter automatically opens when it is inserted into the drive unit. Do not open the shutter manually and touch the disc.
- Data cannot be recorded if the recording surface is contaminated.



- The caddy is precisely adjusted at the factory. Do not disassemble it.

Storing Discs and Caddies

- Remove the caddy from the drive unit before moving the drive.
- Do not store the disc and caddy in a location subject to:
 - high humidity
 - high temperature
 - excessive dust
 - direct sunlight

Care of Discs

- Hold the disc by its edge. Do not touch the surface.
- Wipe the CD-ROM disc with the optional CD cleaner to clean it.
- Do not wipe a CD-R disc with a cleaner before recording data. To avoid scratching the recording surface, blow away dust using an air blower.

Operating the Drive

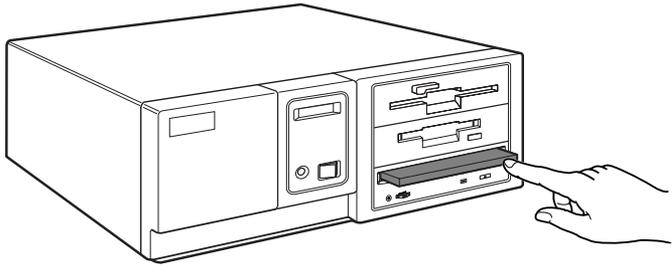
Make sure that the application software is installed in the host computer before using the drive.

Starting Up

- 1 Turn on the power supply.
- 2 Insert the caddy into the drive slot with the disc's label facing up, and push it partially into the drive until the automatic loading mechanism pulls the caddy in.

Important:

When inserting the caddy, let the automatic loading mechanism pull it into the drive by itself. Do not hold onto the caddy or attempt to overpower the loading mechanism.



The drive begins reading the Table of Contents (TOC) data. The busy indicator lights amber while the TOC data is being read. When the busy indicator changes to green, the drive is ready to receive commands, and data may be retrieved from the disc. After loading the CD-R disc, it takes a moment for the drive to become ready while the Program Memory Area is read. From here on, follow the instructions provided with the application software.

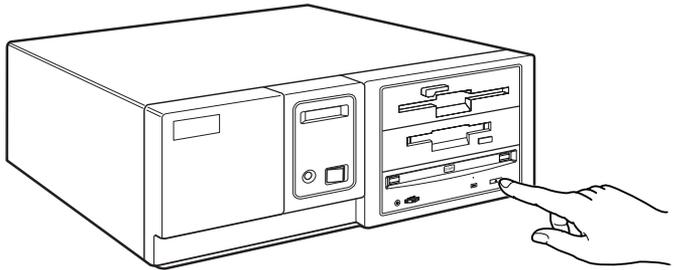
Notes:

- The drive unit does not allow a caddy to be inserted if:
 - PREVENT/ALLOW of the jumper block is set to OFF.
 - the host computer is set to the PREVENT mode by the software.
- The busy indicator keeps on lighting amber if:
 - the disc is not properly inserted.
 - a malfunction occurs.

In such a case, eject the caddy and re-insert it properly. If the busy indicator remains lit amber, consult your dealer or qualified service personnel. The busy indicator also lights amber during audio play. However, this is not a malfunction.

Ejecting a Caddy

- 1 Turn on the power supply.
- 2 Press the eject button on the drive unit.



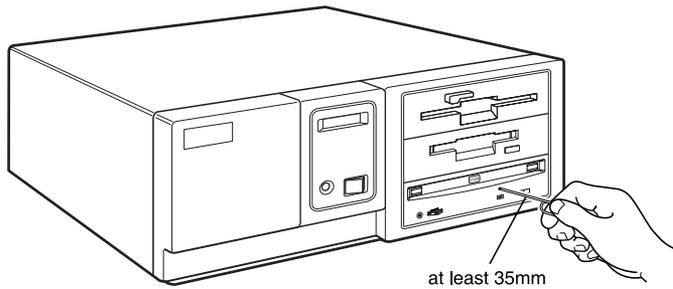
Notes:

- The eject button does not work if it is disabled by the software.
- To eject a caddy when the eject button is disabled by the software:
 - Make sure that the jumper block's PREVENT/ALLOW is set to ON.
 - Turn the power of your computer off, and turn it on again. (Or reset the SCSI bus using a software command.)

■ Ejecting a caddy manually in an emergency

In the event of electrical or mechanical failure of the drive unit, a manual emergency eject is provided to allow removal of the caddy from the drive unit.

- 1** Turn off the power of your computer.
- 2** Insert a pointed object, such as a paper clip, into the emergency eject hole, and push with hand. (Typical required force is 59N [6.0kg])



After removing the caddy from the drive unit, consult your dealer or qualified service personnel.

Specifications

■ General

Host interface	SCSI-2, single ended, 50 pin
Read Function	
Acceptable discs:	CD-ROM mode-1 data discs CD-ROM XA discs CD-Audio discs Audio-combined CD-ROM discs CD-I discs CD-I Ready Discs Photo CD (Single and Multi session) Video CD CD-R discs (Conforming to “Orange Book Part II”)
Write Function	
Applied Format:	CD-ROM Mode-1 CD-ROM XA CD-Audio Audio-combined CD-ROM CD-I Video CD CD-Text
Writing Method:	Disc at once Session at once Track at once Variable packet writing (Packet size : max. 2 Mbyte) Fixed packet writing (Packet size : max. 2 Mbyte) Multi-session
Cache memory(R/W)	2 Mbyte
Disc diameter:	12 cm(8cm Read Only)
Rotational speed	
Innermost track:	600 min ⁻¹ (600 rpm) at CLV = 1.4 m/s (1x) 1200 min ⁻¹ (1200 rpm) (2x) 2400 min ⁻¹ (2400 rpm) (4x) 4240 min ⁻¹ (4240 rpm) (8x)
Outermost track:	200 min ⁻¹ (200 rpm) at CLV = 1.2 m/s (1x) 400 min ⁻¹ (400 rpm) (2x) 800 min ⁻¹ (800 rpm) (4x) 1600 min ⁻¹ (1600 rpm) (8x)

■ Drive performance

Data transfer rate	
Sustained rate:	150 kbytes/s (1x) 300 kbytes/s (2x) 600 kbytes/s (4x) 1200 kbytes/s (8x)
SCSI Interface	
Burst rate:	5 Mbytes/s (asynchronous) 10 Mbytes/s (synchronous)
Access time	
Full stroke:	500 ms (typical/1x) 450 ms (typical/2x) 400 ms (typical/4x) 350 ms (typical/8x)
Average:	350 ms (typical/1x) 300 ms (typical/2x) 250 ms (typical/4x) 220 ms (typical/8x)

■ Reliability

Read error rate (includes retry, normal disc)	
L-EC on:	1 Block / 10^{12} bits (double)
L-EC off:	1 Block / 10^9 bits (double)

■ Audio

Output level	
Line out:	0.7 V at 47 k Ω
Head phone:	0.55 V at 32 Ω

■ Environmental conditions

Temperature and humidity	
Operating	5 °C to 40 °C(41°F to 104 °F) (no condensation)
Transportation	-40 °C to 60 °C(-40 °F to 140 °F), 10 % to 90 % (within 72 hours, no condensation)
Storage	-30 °C to 50 °C(-22 °F to 122 °F, 10 % to 90 % (within 6 months, no condensation)
Temperature and humidity gradients	10 °C/hour, 10 %/hour
Vibration	
Operating	Read: 1.96 m /s ² (0.2 G o-p) at 5 Hz to 300 Hz (sweep) Write: 0.98 m /s ² (0.1G o-p) at 5Hz to 300 Hz(sweep)

Non-operating Transportation	19.6 m /s ² (2 G o-p) at 7 Hz to 300 Hz 1.44 m ² /s ³ -Hz (0.015 G ² /Hz) at 5 Hz to 50 Hz
Shock	
Operating	Read: 49 m /s ² (5 G o-p) at 11 ms half sine wave (includes 5 retries) Write: 4.9 m/s ² (0.5 G o-p) at 11ms half sine wave
Non-operating	490 m /s ² (50 G o-p) at 11ms half sine wave
Transportation	76 cm drop (with standard individual package)

■ Dimensions and weight

Dimensions	146.0 x 41.4 x 203.0 mm (w / h / d) (5 3/4 x 1 5/8 x 8 inches)
Mass	1.0 kg

■ Power requirement

Voltage Ripple	+5 V ± 5 % DC and +12V DC ± 10 % +5 V: 0.05 Vp-p +12 V: 0.1 Vp-p	
Current		
Hold track state	+5 Vdc	700 mA (Typ) < 900 mA (Max)
	+12 Vdc	500 mA (Typ) < 800 mA (Max)
Seeking	+5 Vdc	760 mA (Typ) < 1000 mA (Max)
	+12 Vdc	1000 mA (Typ) < 1400 mA (Max)
Spin up/Write	+5 Vdc	760 mA (Typ) < 1000 mA (Max)
	+12 Vdc	900 mA (Typ) < 1400 mA (Max)
Stand by	+5 Vdc	500 mA (Typ) < 800 mA (Max)
	+12 Vdc	120 mA (Typ) < 200 mA (Max)

■ Connectors

Power-in/Interface connector	Molex 53450-5411 or equivalent
Audio connectors	Molex 50460-4A or equivalent

■ Laser

Type	Semiconductor laser GaAlAs
Wave length	778 to 787nm (at 25 °C ± 2 °C)
Output power	2.5 mW (Read) 60 mW (Write)
Beam divergence	60 degree

■ Supplied accessory

User's Guide	(1 each)
Disc Caddy OPA-2000	(1 each)

■ Optional accessories

CD ROM discs:	YHDS-50 "CD-ROM Test Disc Type 1.3" (equivalent to YHDS-4) YHDS-100 "CD-ROM Test Disc Type 2.0" (audio-combined)
Additional caddies:	OPA-2000

■ Crystal frequency

33.8688 MHz
34.5744 MHz

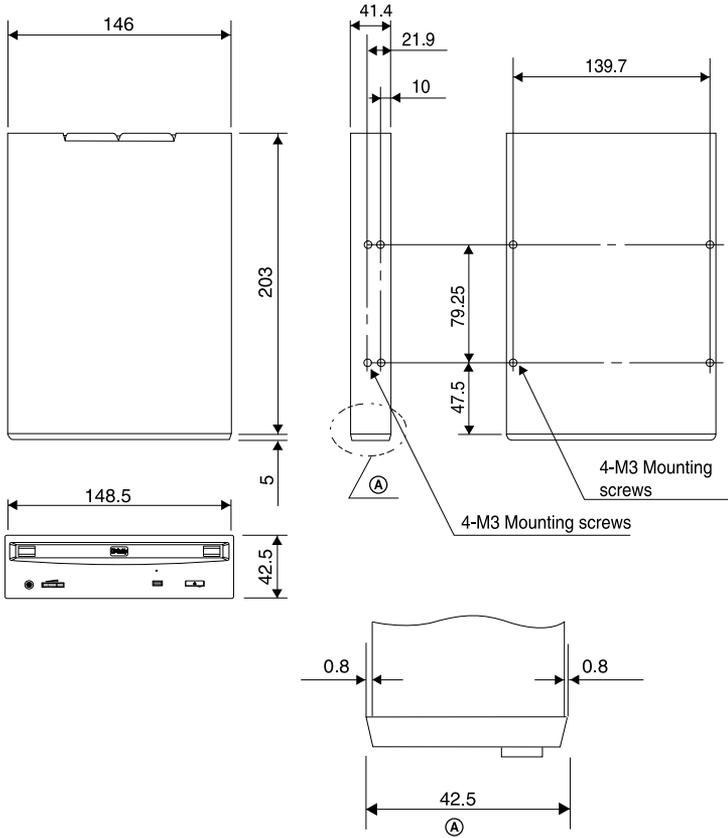
Design and specifications are subject to change without notice.

Diese Ausrüstung erfüllt die Europäischen EMC-Bestimmungen für die Verwendung in folgender / folgenden Umgebung(en):

- Wohngebieten
- Gewerbegebiete
- Leichtindustrialgebiete

(Diese Ausrüstung erfüllt die Bestimmungen der Norm EN55022, Klasse B.)

■ Dimension diagram



Unit : mm

Important:

Screws must not extend more than 4.0mm into the side panels or the bottom plate.