

E1456

ASUS[®]
CRW-5232AS
52x/32x/52x CD-RW Drive



User Guide

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Notices

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

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 manufacturer's 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 of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.



sult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

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

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Observe the following precautions before installing and using the ASUS CRW-5232AS drive.

Installation notices

Do not place this device in an unstable position, or on vibrating surfaces.



Do not place this device under direct sunlight, or in humid or damp places.



Do not use or place this device near magnetic fields, televisions, or radios to avoid electronic interference that affects drive performance.



Do not attempt to disassemble or repair the drive. Opening the drive may result to exposure to laser radiation.



Using the device

- Use of any controls, adjustments, or procedures other than those specified in this manual may result to hazardous radiation exposure.
- Do not attempt to disassemble the drive.
- Do not move the device from a cold to a warm or hot environment. Drastic change of temperature is harmful to the device.
- Before moving or uninstalling the drive, remove disc from it, if any.
- Prevent liquids or any metal to get into the device. If this situation occurs, contact your retailer for help.
- Do not use any evaporating solvents to clean the device. If you accidentally sprayed any solvent on the device, use a clean cloth to wipe it. You may also use a neutral cleaner to dilute the solvent to easily wipe it from the device.
- Try not to interrupt the supply of power while the device is in reading or writing mode.
- Do not place damaged or warped discs inside the device. A warped disc may break while in use and damage the device.
- Do not place discs into the device immediately if they came from a cold environment, specially during cold seasons. Wait until the discs have reached room temperature.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this guide.



WARNING/DANGER: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Information that you **MUST** follow to complete a task.



NOTE: Tips and additional information to aid in completing a task.

Package contents

Check if the following items are present and in good condition upon opening your **CRW-5232AS** drive package. Contact your retailer if any of the items is damaged or missing.

- ASUS CRW-5232AS internal IDE drive
- IDE cable
- Mounting screw set
- Audio cable
- Emergency eject pin and instruction slip
- User Guide (English and Traditional Chinese)
- Multi-language quick installation guide
- Software CD



The above items are available in retail boxes only. The package contents are subject to change without notice.

Welcome

Thank you for buying the **ASUS CRW-5232AS drive!** Read the instructions and important information in this guide for proper use and installation of this device.

Product introduction

Specifications

The **CRW-5232AS** has the following specifications.

Speeds	52X, 48X, 40X, 32X, 24X, 16X, 8X, 4X writes 32X, 24X, 16X, 12X, 10X, 8X, 4X rewrites 52X reads (maximum)
Interface	ATAPI specification
Technologies	FlextraSpeed™ and FlextraLink™ Double Dynamic Suspension System II (DDSSII™) Constant Angular Velocity Recording

Specifications

Data Buffer Size	2 MB
Application Discs	12 cm or 8 cm diameter, 1.2 mm thick CD-Audio, CD-ROM, CD-ROM/XA, CD-I, Mixed Mode CD-ROM, Photo CD, CD-Extra, Video CD, CD-Text, DVCD, CD-G, Karaoke CD, I-trax, Bootable CD
Recording Format	Disc-At-Once, Track-At-Once, Session-At-Once, Packet Write
OS Compatibility	Windows® 98/ME/2000/NT/XP DOS 6.xx, Linux operating system
Power Supply	DC 5 x (1±5%)V DC 12 x (1±10%)V
Dimensions	149 (w) x 41.5 (h) x 171.2 (d) mm
Mass	830 g



Refer to “Technical Information” on page 39 for detailed specifications.

Features

The ASUS CRW-5232AS is a CD-RW drive with 52X-write, 32X-rewrite, and 52X-read capabilities. The drive complies with the AT Attachment Packet Interface (ATAPI) specification and comes equipped with the latest innovative technologies in CD recording. Designed to be shorter than common internal CD-RW drives, the ASUS CRW-5232AS is an ideal optical drive solution for mini-PC systems.

The ASUS CRW-5232AS employs the ASUS *FlextraSpeed™* and *FlextraLink™* technologies to ensure an efficient and reliable data transfer and storage.

FlextraSpeed™ increases accuracy and reliability when rewriting across a wide range of disc media, while *FlextraLink™* prevents buffer underrun problems for error-free recordings. The following sub-sections describe these technologies in detail.

***FlextraSpeed™* Technology**

The ASUS *FlextraSpeed™* technology provides the optimum solution to ensure quality recording when using discs that require flexible speeds. The CRW-5232AS drive employs this technology that allows automatic recording speed adjustment based on the recording media.

In addition to the fact that there are low and high quality recording media, various other factors such as dye layer, temperature, humidity, dust, fingerprints, etc., affect the recording characteristics of CD-R and CD-RW discs. Due to these factors, some discs may not be able to stand the high-speed capabilities of the latest CD-RW drives. The *FlextraSpeed™* technology solves this problem by automatic assessment of the disc quality and recording capability. The recording speed is based on these factors. If you use a high quality recording disc, you can maximize the recording capability of the drive and get the best quality output. If you use a low quality disc, the drive speed adjusts to the level that is most appropriate for the disc, still optimizing the disc recording capability.

The *FlextraSpeed*[™] technology also helps maintain the CD-RW drive because of the controlled motor rotation speeds and reduced noise caused by spindle air, thus prolonging the drive motor's life and ensuring high-quality recording.

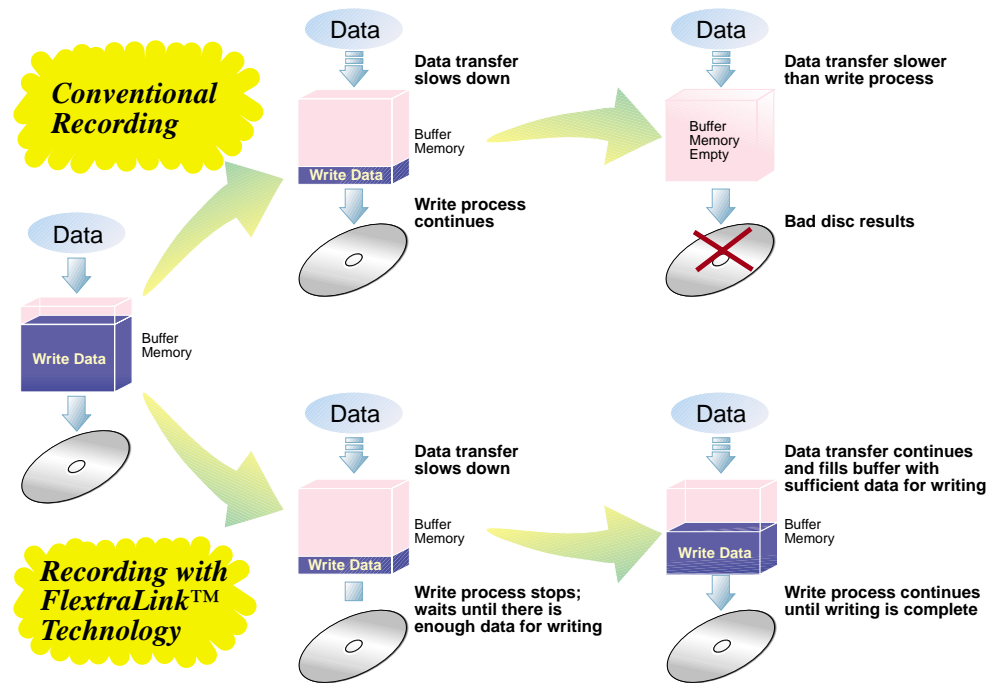
***FlextraLink*[™] Technology** 

The ASUS *FlextraLink*[™] technology provides a seamless combination of flexibility and ultra-reliable recording quality.

FlextraLink[™] incorporates a flexible strategy that prevents buffer underrun problems caused by an empty data buffer. This CD-RW drive technology allows continuous monitoring of the data buffer status during the write process. Once the available data drops to approximately 1% of the total buffer capacity, the drive stops recording and marks the last write position. When new data is received from the host, it is loaded to the data buffer, and the laser is repositioned to link the new data with the data already written. *FlextraLink*[™] uses minimal system resources so that your PC remains fully operational throughout the writing process, and available for other applications.

The diagram on the following page shows the advantage of the *FlextraLink*[™] recording technology.

FlextraLink™ Technology Solution



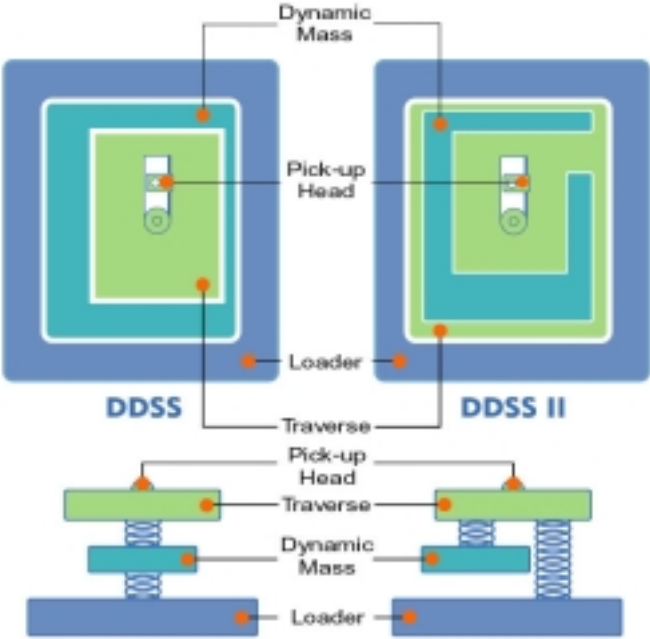
Double Dynamic Suspension System (DDSS II)

The DDSS II is an enhanced follow up to the DDSS anti-vibration system developed by ASUS. The DDSS technology is designed to reduce the vibration generated from spindle rotation of over 8900 rpm of CD-RW drives. The DDSS II improves this feature by handling up to over 10,000 rpm of the new CD-RW drives. In addition, the DDSS II stabilizes the pick-up head of the drive in both horizontal and vertical directions, making tracking and focusing even more precise.

Like the DDSS, the DDSS II vibration absorption structure contains a “dynamic mass” that can absorb the vibration caused by high revolution of spindle motor. However, the DDSS II moves the dynamic mass to be suspended to the chassis, thus providing more stability and accuracy when accessing data from the disc.

The diagram on the following page illustrates the DDSS/DDSS II design structure.

DDSS / DDSS II Design Structure

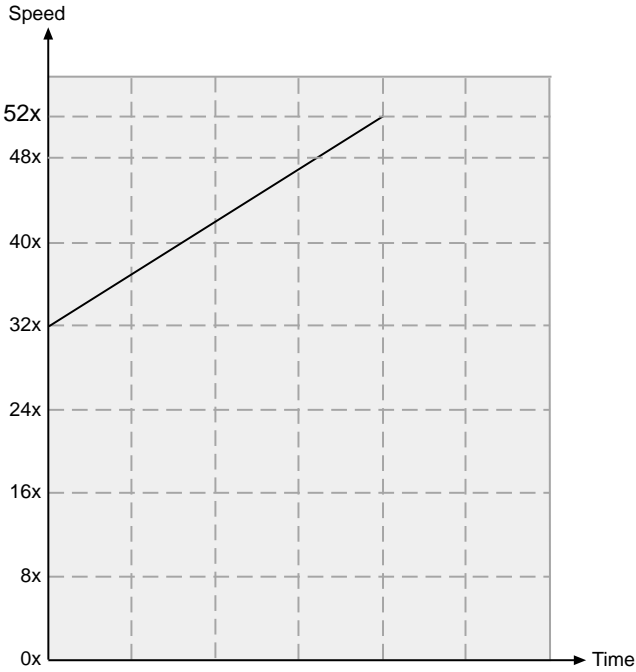


Constant Angular Velocity (CAV) Recording Technology

The CRW-5232AS drive employs the Constant Angular Velocity (CAV) recording method. With CAV recording, the drive spindle motor rotates the disc at the same speed regardless of the radial position of the pickup head. This means that there is a higher transfer rate when writing data to the outer tracks of the disc than to the inner tracks, as the head traverses a longer linear path on the outer than the inner part of the disc.

Although the transfer rates vary, and may not be at maximum, depending on the part of the disc being written to, the CAV method allows faster recording speed because the rotation speed does not have to change when the head writes data to different areas of the disc. This is primarily advantageous for computer applications.

CAV Recording Method



Front panel



1. Headphone jack

This jack allows you to connect a headphone with a stereo mini-plug.

2. Headphone volume dial

Control the volume of the headphone connected to the drive by turning the dial to the left (volume decreases) or right (volume increases).

3. Disc Loading Tray

This tray holds the disc. Open the loading tray by pressing the STOP/EJECT Button. Place a CD on the tray with the label side up. Press the STOP/EJECT Button or push the front part of the tray to load the disc.

4. WRITE indicator (Red LED)

This LED flashes when data is being written on the disc.

5. READ indicator (Green LED)

This LED lights up when you place a disc on the drive tray and turns off when the disc is removed. The LED flashes when data is being read from the disc.

6. Emergency Eject Pinhole

The Emergency Eject Pinhole allows you to manually eject a disc when the STOP/EJECT Button does not work due to power failure or software problems. Insert the emergency eject pin or a paper clip into this hole to manually eject the tray and the disc. Refer to page 36 for details.

7. PLAY/SKIP button

Press this button when the drive is idle to start playing the first track of an audio disc (if one is currently loaded in the drive). When in PLAY mode, press this button to skip to the next track on the disc.

8. STOP/EJECT button

Press this button to eject the disc loading tray. When in PLAY mode, press this button to stop playing the disc.

Rear panel



9. Digital audio connector

This connector is for a digital signal output cable.

10. Analog audio connector

This connector is for an analog signal output cable.

11. Jumper terminals

These pins allow you to select either Master, Slave, or Cable Select mode for the CD-ROM device. Refer to page 28 for jumper terminal settings.

12. IDE connector

This connector is for a 40-pin IDE cable to connect the drive to the IDE interface on the motherboard.

13. Power connector

This DC connector is for a 4-pin power cable from the system power supply.



The jumper pins on the leftmost part of the rear panel are factory test pins. DO NOT cover these pins with jumperblocks.

Installation

System requirements

Before installing the CRW-5232AS drive, make sure that your computer system meets the following requirements.

- IBM-compatible Pentium III 700MHz or Celeron 700MHz or AMD Duron 850 MHz or higher PC
- Windows® 98/ME/2000/NT/XP, DOS 6.xx, Linux operating system
- At least 64MB RAM (128MB recommended)
- An empty 5.25-inch drive bay
- HDD empty storage capacity of 100MB or more
Average seek time: 20ms or less
Transmission rate: 2 MB/s or more



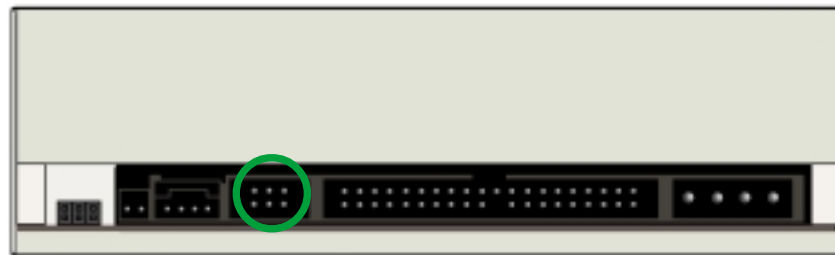
1. Avoid using a hard disk that thermally calibrates during operation.
2. Do not insert damaged or warped disc in the drive to avoid potential body injury or damage to the drive.

Setting the jumper terminals

Set the jumpers to configure the drive as either master or slave mode before installing it into the computer chassis. Refer to next page for an explanation of each drive mode. Select your desired mode by placing the jumper cap over the pins.



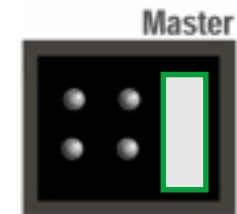
Put the jumper caps properly over the pins to avoid damage to the drive.



Jumper terminals

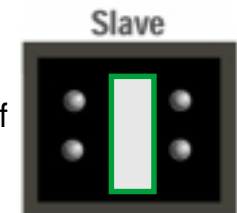
Master Mode

Cover the two pins labeled MA to set the CRW-5232AS drive as a secondary master drive. Select this mode if your computer supports four IDE devices. The computer hard drive is set as Primary Master.



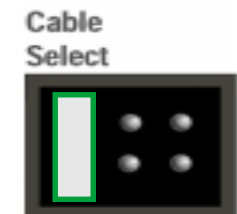
Slave Mode

Cover the two pins labeled SL to set the CRW-5232AS drive as a slave device if your computer supports only two IDE devices. If your computer supports four IDE devices, this mode sets your CRW-5232AS drive as either Primary or Secondary Slave.



Cable Select Mode

Cover the two pins labeled CS if your computer supports a Cable Select (CSEL) signal. You need an exclusive interface cable for this mode. Refer to your computer manual for details.



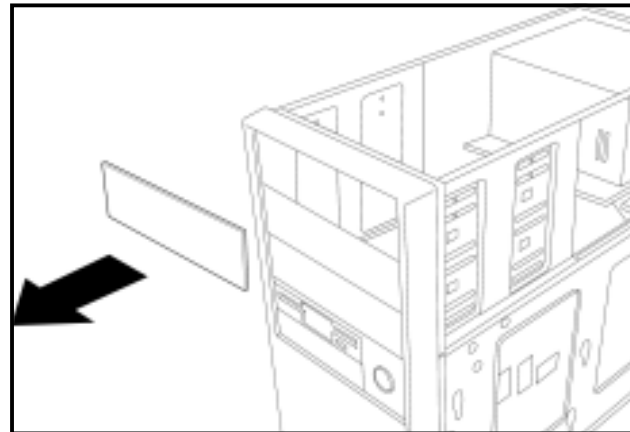
Installing the CRW-5232AS drive

Follow these steps to install the drive into the computer chassis.

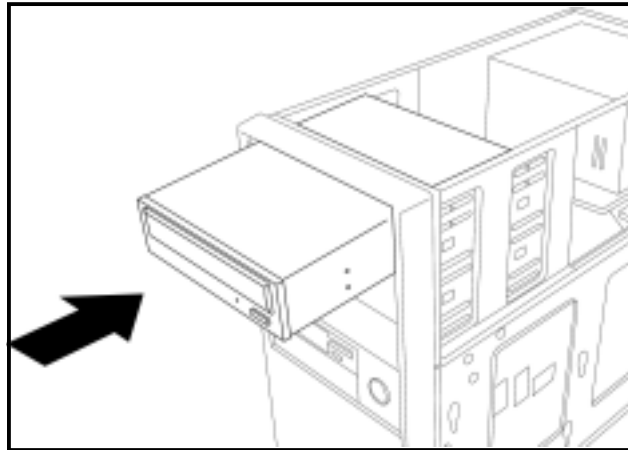


Refer to your computer manual for specific instructions on opening the chassis and installing drives.

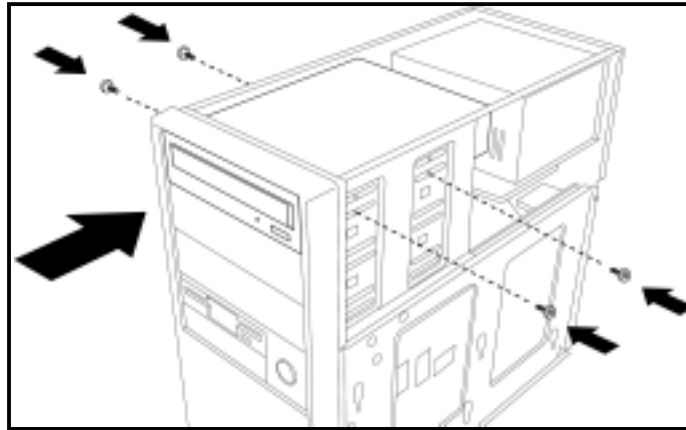
1. Remove the cover of an empty 5.25-inch drive bay.



-
2. Carefully insert the drive into the bay and push it inward until it is flushed to the chassis front panel. The holes on the sides of the drive should align with the holes on the drive bay.



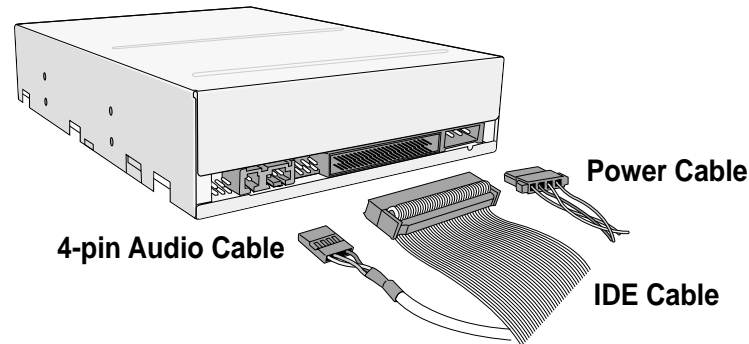
3. Secure the drive with screws that came with the drive package. Use two screws on each side of the drive.



Depending on the space on your chassis, you may need to connect the drive cables before securing the drive into the chassis. For cable connections, proceed to the following section, “Connecting the Drive Cables.”

Connecting the drive cables

1. Connect the power cable plug to the power connector on the rear panel.
2. Connect the 40-pin IDE cable plug to the IDE connector, matching the red pin stripe on the cable with Pin 1 on the connector.
3. If your computer has a sound card or an onboard audio feature, connect an audio interface cable to the 4-pin analog audio connector on the rear of the drive. Connect the other end of the audio cable to the connector on the sound card or on the 4-pin CD connector on the motherboard.



All the cable plugs are slotted so that they fit in only one orientation. If a plug does not fit in completely, try reversing it. DO NOT use too much force when fitting the cable plugs. Replace the computer cover according to your computer manual.

CRW-5232AS drive basics

Recommended media

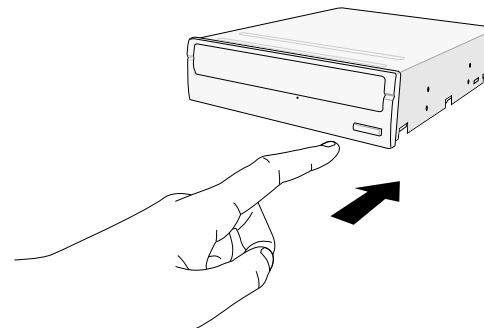
The following discs are recommended for use with the CRW-5232AS drive.

CD-R: Mitsubishi Chemical, Prodisc, Ritek, Taiyo, Yuden, TDK

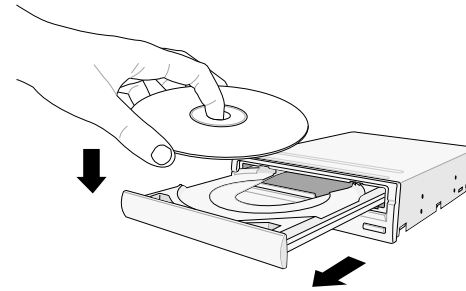
CD-RW: AMT, CMC, Mitsubishi Chemical, Prodisc, Ricoh, Ritek

Placing a disc into the drive

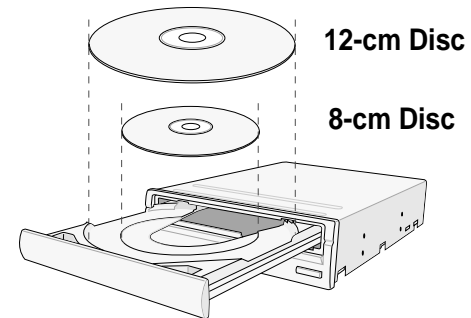
1. Press the STOP/EJECT button on the front of the drive to eject the tray.



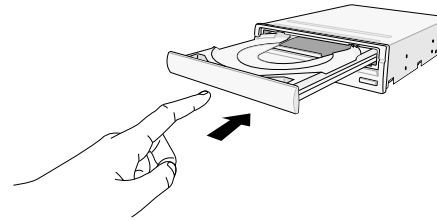
2. When the drive tray ejects out of the drive, place the disc on the tray with the label (printed) side up.



If you are using a 12-cm disc, place it on the outer circular border of the tray.
If you are using an 8-cm disc, place it on the inner circular border.



-
3. Press the drive STOP/EJECT button or lightly push the center of the drive tray to replace the tray inside the drive.



Ejecting a disc from the drive

1. Press the STOP/EJECT button on the front of the drive to eject the tray.
2. Carefully remove the disc from the tray.
3. Press the drive STOP/EJECT button or lightly push the center of the drive tray to load the tray back into the drive.

Using the emergency eject pinhole

The emergency eject pinhole on the front panel of the drive allows you to manually eject the drive tray and remove a disc from the drive in case:

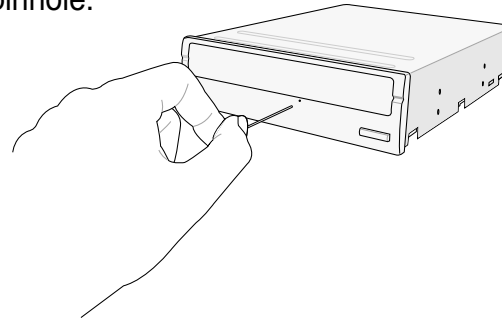
- the supply of power to the computer is cut due to electrical power outage, or
- the drive malfunctions.



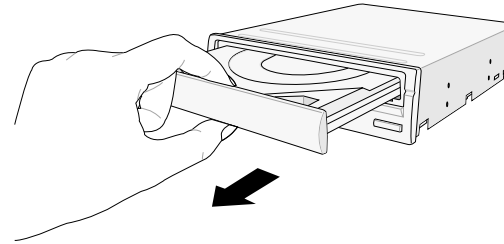
Use the manual method only when the STOP/EJECT button does not work.
Turn off your computer before manually ejecting the drive tray.

To eject the drive tray using the emergency pinhole:

1. Insert the Emergency Eject Pin that came with the drive package into the Emergency Eject Pinhole. You may also use a paper clip or any pointed rod small enough to fit into the emergency eject pinhole.



-
2. Carefully pull the tray out and remove the disc.



Do not force the tray open. Wait until the eject pin has dislodged the tray to avoid breaking the tray panel.

Using compact discs

Take note of the instructions in this section when using compact discs. These instructions will help you avoid damaging the discs and your drive.

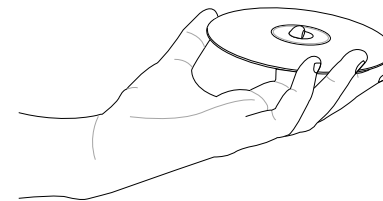
Cleaning a disc

Spray the disc with compressed air for about five seconds to get rid of the dust on a disc.



Handling a disc

Hold a disc by the edges. Do not touch the disc surface.



Technical information

Environmental specifications

Temperature	Operation:	0°C < to < 45°C
	Storage:	- 20°C to < 60°C
Humidity	Operation:	20% to 80% non-condensing
	Storage:	15% to 85% non-condensing
Vibration	Operation:	0.3G peak at 5 ~ 500 Hz
	Storage:	2.0G peak at 10 ~ 500 Hz
Impact	Non-operation:	1 oct/min – no damage Less than 50G – (at 11ms/half sine wave, 3 shock/each side)
	Packaged:	1 oct/min – no damage 91 cm high – (1 corner, 3 edges, 6 surfaces)
Acoustic	Access Mode:	47.5 dBa TYP
	Read Mode:	45 dBa TYP
Reliability	MTBF:	100,000 power on hours
	ODC (Read):	20% of power on time
	ODC (Write):	1% of power on time
Mean Time To Repair (MTTR)		30 minutes

* ODC - Operating Duty Cycle

Electrical and audio specifications

Power Source	Voltage	+5V DC	+12V DC
	Tolerance	+/- 5%	+/- 10%
	Ripple	150m Vpp	300m Vpp
	Rating	900mA	1500mA
IO Terminal	Power connector	4-pin +5V, +12V	
	ATAPI terminal	40-pin	
	Audio out	4-pin (analog)	
		2-pin (digital)	
Audio	No. of channels	2 (stereo)	
	Sampling frequency	44.1 kHz	
	Quantization	16 bits	
	Distortion	0.2% max. (at 1 kHz)	
	S/N ratio	70 dB	
	Line Out	0.70 V rms (typical)	