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Hitachi GD-7000 8X DVD-ROM User's Guide (English)

Last revised: 09 October 2001

Introduction: Hitachi GD-7000 8X DVD-ROM User's Guide

Manufacturer Hitachi

Model Number GD-7000 DVD-ROM

Drive speed

DVD-RAM	2X (ZCLV)
DVD-ROM	
Single Layer	8X max. (3.3 – 8x Full CAV)
Dual Layer	8X max. (3.3 – 8x Full CAV)
DVD-R	2.5X max. (1 – 2.5X Full CAV)
CD-ROM	40X max. (17 – 40X Full CAV)
CD-R	40X max. (17 – 40X Full CAV)
CD-RW	24X max. (10 – 24X Full CAV)
CD-I/VIDEO CD	10X max. (4.3 – 10X Full CAV)
CD-DA (DAE)	20X max. (8.6 – 20X Full CAV)
CD-DA (Audio out)	10X max. (4.3 – 10X Full CAV)

Bus interface (E-IDE ATAPI)

Types of disc formats supported (read only)

DVD:

- DVD-ROM (Single layered and Dual layered disc)
- DVD-R 3.95GB & 4.7GB
- DVD-RAM 2.6GB & 4.7GB

CD:

- CD-ROM Mode-1 and Mode 2 data disc
- CD-ROM XA
- CD-I
- CD Audio disc
- Mixed mode CD-ROM disc (data and audio)
- Photo-CD Multisession
- CD-Extra
- CD-RW
- CD-R
- CD TEXT

Disc-loading mechanism (Tray type auto loading)

3-way disc ejection (eject button, software, emergency eject hole)

Key DVD-RAM features

-High speed access: 210 ms typical (1/3 stroke)

-Read compatible for both 4.7Gbytes/side and 2.6Gbytes/side DVD-RAM disc (Bare media only)

-4.7Gbytes/side DVD-RAM 2X speed ZCLV: 2.770 Mbytes/s typ.

-2.6Gbytes/side DVD-RAM 2X speed ZCLV: 2.770 Mbytes/s typ.

Key DVD-ROM features

-High speed access: Random access time 120 ms typical (DVD Single layered disc)

-Single layered disc: 3.3 to 8X max. Full CAV, data transfer: 10.8 Mbytes/s max.

-Dual Layered disc: 3.3 to 8X max. Full CAV, data transfer: 10.8 Mbytes/s max.

-DVD-R (3.95 GB): 1 to 2.5X max. Full CAV, data transfer: 3.46 Mbytes/s max.

-DVD-R (4.7 GB): 1 to 2.5X max. Full CAV, data transfer: 3.46 Mbytes/s max.

-Read compatible for both 4.7Gbytes/side and 3.95Gbytes/side DVD-R disc.

Key CD-ROM features

-High speed access: Random access time 90 ms typical

-17 to 40X max. Full CAV, data transfer : 6.0 Mbytes/s max.

-CD-R and CD-RW disc read compatible

-Photo-CD Multi-session compatible

-Addressing Method 2 for fixed length Packet supported (CD-R ORANGE BOOK Part 2)

-CD Extra compatible

-CD TEXT compatible

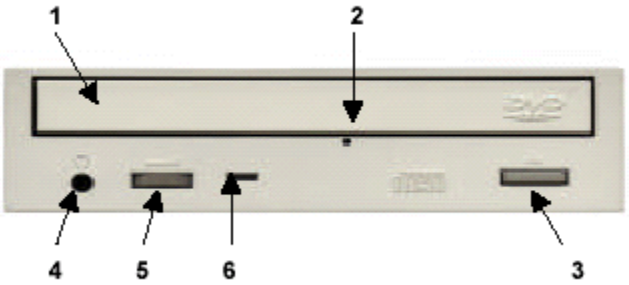
-CD-DA (Digital Audio) data output through the IDE bus

-Embedded error correction EDC & ECC for Mode 1 & Mode 2 Form 1

-MPC 3 compatible

DVD Configuration

This DVD-ROM drive should be used only in its current hardware and software configuration.



1. Disc Tray – The disc tray holds the media. The power must be turned on before opening/closing the disc tray. Insert the disc into the disc tray.

2. Manual Emergency Eject Hole – The emergency eject procedure should only be used to retrieve a disc if the drive fails to eject.

3. OPEN/CLOSE button – Press this button to open/close the disc tray.

4. Headphone Jack – The headphone jack is an optional feature in the GD-7000 model DVDROM. If this applies to your drive, this is for connecting headphones to the DVD-ROM drive.

5. Headphone Volume Control – Use this to adjust the volume of your headphone.

6. Power/Loading/Unloading/Busy Indicator – Indicator blinks green when the disc tray is being opened or closed, or when the drive is accessing data.

- During disc unloading, indicator will blink green for a few seconds.
- During spin down, indicator will be solid green for a few seconds.
- During disc loading, indicator will be blink green for a few seconds.
- During spin up, indicator will be solid green for a few seconds.

Using the DVD-ROM Drive: Hitachi GD-7000 8X DVDROM User's Guide

Operating the Drive

Drive operation

1. Turn on your system, including the DVD-ROM drive.
2. To open the DVD-ROM disc tray, press the OPEN / CLOSE button.
3. Place the disc in the center of the disc tray with the label side facing up.
4. To close the disc tray, press the OPEN / CLOSE button on the DVD-ROM drive or push lightly on the center of the disc tray. The disc tray will automatically close.

Usage guidelines

- Keep the disc tray closed when not using the DVD-ROM drive.
- Do not press down on the disc tray when opening or closing it.
- Do not place objects on the disc tray.
- Never use a damaged, broken, or deformed disc.
- Do not press the Open/Close button while the drive is playing a DVD movie. To stop a DVD movie, click the Stop button in the DVD player application program.
- This drive is designed to respond to the region code that is recorded on a DVD disc. If the region number described on the DVD disc does not match the drive region, playback will not be possible. Refer to your software manual for help. If you are using the drive as a data only device, you will not be able to play DVD Video (movies).

Copy Protection and Regional Coding

The Motion Picture Industry requires that DVD Drives conform to the Contents Scramble System (CSS) to prevent copying DVD movies from DVD discs. To obtain a CSS license, the drive must conform to two copy protection elements known as Copy Protection and Regional Coding.

Copy Protection and Content Scramble System

The DVD drive contains the Content Scramble System (CSS) which controls the Copy Protection. The DVD drive's CSS system undergoes an authentication process using the DVD disc. DVD Disc producers (normally movie DVD Discs) incorporate specialized software on the DVD disc from which the DVD drive can authenticate. Once the authentication process concludes, the drive can play the movie disc, but will not allow the drive to provide digital data for the purpose of replicating the DVD disc content.

Regional Playback Control

The motion picture industry divides the world into six regional "zones". These regions or "zones" correlate to the regional markets into which the motion picture industry releases movies. Each regional zone is numbered "One" through "Six", called the Region.

Region One North America

Region Two Western Europe, Japan & Middle East

Region Three Southeast Asia

Region Four Mexico, Central & South America, Australia

Region Five Africa, Russia, Eastern Europe

Region Six China

DVD movie discs are released for each region and are controlled by each region. The RPC code prevents the new release of movies into other motion picture market regions prior to their true release dates within those markets. All DVD movie discs are coded for one or more regions. RPC Codes are placed on Movie Discs that correlate to the region they are intended for sale. A DVD Drive must likewise be set to a region. For example, a PC user located in Canada, would have their DVD Drive set to Region One, or a PC user located in France would have their drive set to Region Two. A DVD disc can only play on a DVD drive coded for its region. The Canadian PC user could only play Region One coded Movie DVD discs and a French PC user could only play Region Two coded movie discs. The Regional Playback Control system does not allow users to play DVD discs that are not set for their drive. If a user attempts to play a DVD movie disc for a region the DVD drive is not set, the user will receive an error message explaining the DVD title is of another region and cannot be played. DO NOT RESET THE REGION.

Setting and Changing the Region Setting of the DVD Drive

To play a DVD movie, the drive must first be set to a Region. Several methods are available to set the region, which are transparent to the user.

- The Manufacturer may set the region at the factory
- If no region is set at the factory, most software will set the drive to the region coded on the first movie DVD disc that is played.
- If the first disc is a multi-region coded disc, the drive will be set to the region determined by such factors as time zone, or language etc. set into the operating system.

Once a drive is set to a region, the region can be reset, but for unusual circumstances only, such as when a user relocates to another region. A REGION CAN ONLY BE RESET FOUR times. Refer to your movie player software manual for specifics about changing the region. In general, to reset the Region, use a DVD movie disc set to the new

region. A notification box will respond, explaining the disc belongs to another region and cannot be played. The notification explains the region setting can be reset. Follow the instructions to reset the Drive.

NOTE: High-speed drives spin the disc at a high rotational speed. If a CD has printing on only half of the disc, or if there is a slight imbalance in the CD, the imbalance is greatly magnified by the high speed, causing the drive to vibrate or produce a fan-like noise. These effects are inherent in the high-speed technology and do not indicate a problem with the drive.

Emergency Ejection (use only in the case of an emergency)

If the disc tray does not open when the OPEN / CLOSE button is pressed:

1. Make sure that the power of the DVD-ROM is turned on.
2. Make sure the lock function has not been activated.
3. Try shutting down your system and turning off all power.
4. Turn power on again and try pressing the OPEN/CLOSE button again.
5. If the disc tray still will not open, the DVD-ROM drive's manual emergency mechanism may be activated.
6. Turn off the DVD-ROM drive and wait at least 15 seconds until the disc stops rotating.
7. Insert a straightened paper clip into the manual emergency eject hole about 25mm (1 inch) to eject the tray.
8. Pull the disc tray open gently.

NOTE: If it is necessary to use the emergency eject procedure to open the drive, the tray should be closed by turning on the power and pressing the OPEN / CLOSE button. Transporting the drive before it has been properly closed may cause damage to the mechanism.

Handling media

DVD media is more sensitive to dust and fingerprints than CD media. Carefully handle media by its edges only. If a DVD movie skips or hangs during playback, clean the media. Most DVD video playback issues are media-related and can be solved by proper handling and care of media.

Cleaning Media

A commercially available "Laser Lens Cleaning" may be used to clean the pick-up lens of the DVD-ROM drive. Use the Compact Disc Laser Lens Cleaner LLC-1 (by AUDIO SOURCE in U.S.A., by Akustik Sisteme Vertriebs GMBH in Germany and by SAEC COMMERCE CO., LTD. in Japan.

1. Turn on the DVD-ROM drive.
2. Press the OPEN/CLOSE button to open the tray.
3. Using the small brush supplied with the cleaning disc case, straighten up the disc cleaning brushes on the back of the cleaning disc.
4. Place the cleaning disc in the disc tray with its arrow marked on the discs at front.
5. Press the OPEN/CLOSE button or push the center of the disc tray lightly and close the disc tray.
6. After about 20 seconds, the pick-up lens is cleaned by the cleaning disc.
7. Press the OPEN/CLOSE button and remove the cleaning disc.
8. Set the cleaning disc in its case with the disc cleaning brushes in the pad hole.
9. Restart the system.

Troubleshooting: Hitachi GD-7000 8X DVD-ROM User's Guide

Problem	Possible Causes	Corrective Action
Cannot play a DVD or CD in the drive or certain types of discs cannot be read in the drive.	1) The disc is placed upside down in the disc tray. 2) The disc is dirty. 3) The pick-up lens is dirty. 4) The disc is scratched or warped. 5) The disc has a region code that cannot be played on the drive.	1) Place the disc right side up. 2) Clean the disc surface. 3) Clean the pick-up lens. 4) Change the disc. 5) Refer to your software manual for help
Disc Tray cannot be opened	1) Power is not turned on. 2) The lock function has been activated. 3) The tray is stuck.	1) Turn the power on and try again. 2) De-activate the lock function. 3) Turn off the DVD-ROM drive. Insert a straightened paperclip into the manual emergency eject hole. Pull the disc tray open
Drive is not recognized by system.	1) The cables are not properly connected.	1) Turn off your system and re-install the device driver.

General

Hitachi

GD-7000

Interface Enhanced IDE (ATAPI Per SFF-8090 and SFF-8020i Rev.2.6)

Compatible CD-ROM standards (read only)

- CD-ROM Mode-1 and Mode 2 data disc
- CD-ROM XA
- CD-I
- CD Audio (CD-DA)
- Photo-CD Multi-session
- Mixed Mode CD-ROM disc (data and audio)
- CD-Extra
- CD-RW
- CD-R
- CD-TEXT

Compatible DVD-ROM standards (read only)

- DVD-ROM (Single layered and Dual layered disc)
- DVD-R 3.95GB & 4.7GB
- DVD-RAM 2.6GB & 4.7GB

Storage capacities: (1 Mbytes = 10^6 bytes, 1 Gbytes = 10^9 bytes)
DVD-ROM:

DVD-5 : 4.7 GB (single-sided, single layer)
DVD-9 : 8.5 GB (single-sided, dual layer)
DVD-10: 9.4 GB (double-sided, single layer)
DVD-18: 17 GB (double-sided, double layer)

DVD-R:

3.95 GB (single-sided)
4.7 GB (single-sided)

DVD-RAM:

2.6 GB (single-sided)
4.7 GB (single-sided)
1.4 GB (single-sided, 80mm)
5.2 GB (double-sided)
9.4 GB (double-sided)
2.8 GB (double-sided, 80mm)

CD-ROM:

650 MB (Mode 1)
742 MB (Mode 2)

Performance

Rotational speed

Approx. 4,710 rpm (DVD-ROM single layer)

Approx. 5,180 rpm (DVD-ROM dual layer)

Approx. 1,490 rpm (DVD-R 3.95 GB disc)

Approx. 1,360 rpm (DVD-R 4.7 GB disc)

Approx. 4,770 to 2,030 rpm, inside to outside (DVD-RAM 2.6 GB)

Approx. 3,250 to 1,380 rpm, inside to outside (DVD-RAM 4.7 GB)

Approx. 9,450 rpm (CD-ROM/CD-R)

Approx. 5,670 rpm (CD-RW)

Approx. 2,360 rpm (CD-I/VIDEO CD)

Approx. 4,720 rpm (CD-DA DAE)

Approx. 2,360 rpm (CD-DA Audio out)

Data transfer rate

Sustained rates (1Mbytes=10^6 bytes=1,000,000 bytes)

DVD-ROM

Single Layered disc	11.0 Mbytes/s max.
Dual Layered disc	11.0 Mbytes/s max.

DVD-R

3.9GB disc	3.46 Mbytes/s max.
4.7GB disc	3.46 Mbytes/s max.

DVD-RAM

2.6GB disc	2.77 Mbytes/s typical
4.7GB disc	2.77 Mbytes/s typical

CD-ROM (Mode-1)	6.0 Mbytes/s max.
CD-RW (Mode-1)	3.6 Mbytes/s max.

Burst rate

PIO Mode 4	16.6 Mbytes/s max.
Single word DMA Mode 2	8.3 Mbytes/s max.
Multi word DMA Mode 2	16.6 Mbytes/s max.
Ultra DMA 33	33.3 Mbytes/s max.

DAE Speed

20X max. (8.6 – 20X CAV)

Access time

120 ms (typical) DVD-ROM

90 ms (typical) CD-ROM

Average latency

6.4 ms DVD-ROM (8X Full CAV speed)

3.2 ms CD-ROM (40X Full CAV speed)

Data error rate

Less than 10^{-12} DVD-ROM

Less than 10^{-12} CD-ROM (Mode 1)

Less than 10^{-9} CD-ROM (Mode 2)

Spin-up time

From power on

9 s : to drive ready mode DVD-ROM (typical)

9 s : to drive ready mode CD-ROM (typical)

From sleep on (stand by)

3 s : to drive ready mode DVD-ROM (typical)

3 s : to drive ready mode CD-ROM (typical)

Memory buffer size

512 kbytes DVD-ROM

512 kbytes CD-ROM

Reliability

MTBF

125,000 Power On Hours (POH)

3,000 POH per year

480 On/off cycles per year

20% of Power on time (seek: 5% of operating time) Operating duty cycle

MTTR

0.5 h Mean time to repair

Audio

2 channels

(20 to 20,000 Hz) ± 3 dB frequency response

0.1% (LPF 20 khZ, 1 khZ) max. Distortion

Output levels

Headphones: 0.65 Vrms typical (Volume maximum, 32 ohms Load)

Line Out: 0.7 Vrms (47 kohms Load, Att=0dB) typical

Output Terminals

Headphones: φ3.5mm Jack

Line Out: 4-pin Terminal

Environmental

Ambient Temperature

5° C to 45° C Operating

-30° C to 60° C Storage/Transportation

Temperature Gradient

10° C/h (max.) Operating

20° C/h (max.) Storage/Transportation

Relative Humidity

15% to 85% Operating

10% to 90% Storage/Transportation

Dew-point Restrictions

29° C

Power

Source Voltage

+5V±5% Ripple<150 mVp-p

+12V±10% Ripple<300 mVp-p

Current

No.	Operating Mode	5V input			12V input			Unit.
		Min.	Typ.	Max.	Min.	Typ.	Max.	
1	Active	-	-	900	-	-	1100	mA
2	Idle	-	600	800	-	100	200	mA
3	Access	-	700	1100	-	700	1100	mA

Note: Measuring condition

1) Power supply voltage: 5V input = 5 ± 2%, 12V input = 12 ± 2%
2) Operating mode is as follows;
   Active : Capable of responding commands in maximum speed. (Describe with effective current)
   Idle : Capable of responding commands in lower speed than active
   Access : Full stroke access

Sleep

0.55 W Typical

0.75 W Maximum

Physical

Height 41.3mm (1-5/8 inch)

Width 146mm (5-3/4 inch)

Depth 180mm (7-1/11 inch)

Mass 980gr (2.16 lbs)

Connectors

IDE Interface connector (with DC input connector)

Audio-output connector

Lasers

CD laser

Red laser

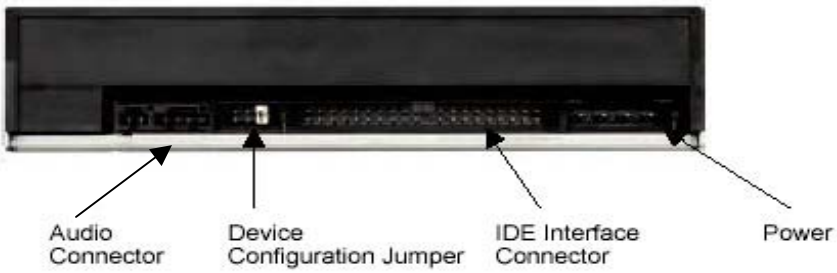
780 nm wave length

DVD laser

Red laser

650 nm wave length

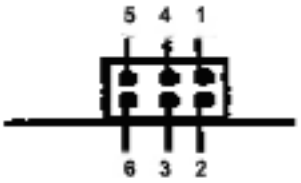
Drive Connectors: Hitachi GD-7000 8X DVD-ROM User's Guide

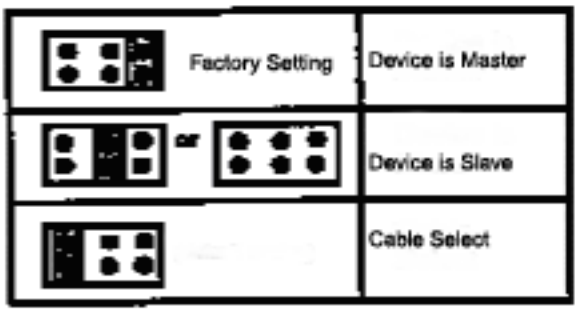


Jumpers: Hitachi GD-7000 8X DVD-ROM User's Guide

PINS	SETTING	DESCRIPTION
1-2	Master (Factory setting)	The drive is set to Master when the jumpers are positioned on the two pins closest to the IDE cable.
3-4	Slave	The drive is set to slave when the jumpers are positioned on the middle two pins. This allows the drive to be on the same cable as the hard drive. This may cause a negative effect on the speed of your hard drive.
5-6	Cable Select	Please contact the manufacturer of your computer for information on this setting.
None	Slave	The drive is set to slave when no jumper is installed. This allows the drive to be on the same cable as the hard drive. This may cause a negative effect on the speed of your hard drive.

Jumper locations





Regulatory: Hitachi GD-7000 8X DVD-ROM User's Guide

UL1950

C-UL (CSA C22.2 No. 950-95)

TUV (EN60950/EN60825)

CB (IEC950/IEC825)

Class 1 laser product comply with DHHS rules 21CFR Subchapter J

FCC Rule Part 15 Class B

CE Marking (89/336/EEC,92/31/EEC,93/68/EEC)

C-Tick Mark

SEMKO

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:

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

 Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.