

FreeCOM ***FS-1 CD-RW***

www.freecom.com



Rev. 212



FREECOM FS-1 CD-RW



USB-2 cable



CardBus cable

USERS MANUAL**GB**

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Dear user!

Welcome to the **FREECOM FS-1 CD-RW** installation. Before you install the device, please read the contents of this manual carefully.

Recommendation: For optimal results, use FREECOM blank CDs.

FREECOM Technologies • Germany
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**Warning !**

All rights reserved. The products named in this manual are only used for identification purposes and may be trademarks or registered trademarks of the respective companies. This device was designed for home or office use.

Warning! This device is equipment complying with EN55022 class A. This equipment can cause radio disturbances in a residential area. If this is the case, the user has to take appropriate measures and assume all responsibility and costs for. It may not be used near or with any life-sustaining systems.

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General Information

The following hardware and software requirements must be fulfilled to ensure trouble-free operation.

Hardware Requirements

In order to use the FREECOM FS-1 CD-RW, following components are needed:

- USB-2 cable or CardBus cable (depending on the connection type chosen)
- USB port or CardBus port (depending on the connection type chosen)
- Pentium I 166 Mhz and higher
- at least 32 MB RAM
- at least 100 MB free hard disk space
- a floppy drive or internet connection for driver installation
- recommended: Pentium II processor or higher, 64 MB RAM or higher, 740 MB hard disk space

Software Requirements

CardBus cable

- Windows 98 SE
- Windows ME
- Windows 2000
- Windows XP

USB-2 cable

- Windows 98 SE
- Windows ME
- Windows 2000
- Windows XP

Media Formats

- Data CDs (ISO 9660 and Joliet)
- Audio CDs
- Mixed mode CDs
- CD-ROM XA
- UDF (Universal Disc Format)
- Photo CDs
- CD-Is

The drive can write,rewrite and read CD-R (W) disks. The capacity of the CD-RW is 650 MB/700 MB. CD-RW disks are only read-compatible with multi-read capable CD-ROMs, DVD-ROMs as well as CD-RW drives.

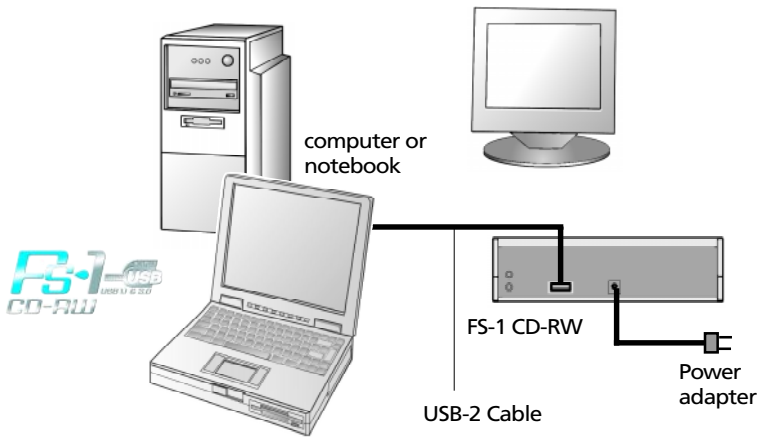
Precaution and operating hints

- The FS-1 CD-RW can be opened in the following modes with the Eject button or with the emergency-eject:
 - in the running mode
 - The tray can be opened at any time by cautious insertion of a pointed object like a bent paperclip and pressing the emergency-eject.
- The FS-1 CD-RW should be operated in horizontal state. It should not be moved during operation.
- Operating the device should only take place within temperature ranges of 5 – 50 °C.
- Please ensure the FREECOM FS-1 CD-RW and media attain room temperature for operation. The reason for this is to avoid condensation which may have occurred at transportation.
- The FS-1 CD-RW should not be used in dusty and humid surroundings.
- Use only the original FREECOM AC adapter (FREECOM Art No 16723). The use of other AC adapters may damage your FS-1 CD-RW. FREECOM refers the right to refuse any warranty claim in case other AC Adapters have been used.
- Avoid places close to a heat source.
- Never move the drive while operating and allow at least 30 seconds spin down time after you switched off the device.
- Avoid contact with any liquids.
- To clean the FS-1 CD-RW use a non-corrosive, clean and dust free soft cleaning cloth.
- The FS-1 CD-RW should not be operated near strong electromagnetic radiation source (loud speakers, mobile phones etc.)

Note: For maximum performance of the FREECOM FS-1 CD-RW, both computer system and software must support USB 2.0. Connecting the FREECOM FS-1 CD-RW to a USB-1 interface will limit the recording speed to 4x.



On the right side of the FS-1 you will find the Kensington security slot. This slot is to help protect the FS-1 from theft. Please see www.kensington.com for details on how this slot works.

CHAPTER 1: FS-1 CD-RW USB-2 version**GB****1**

1. Connect the drive connector of the USB-2 cable to the FREECOM FS-1 CD-RW.
2. Connect the power connector to the FREECOM FS-1 CD-RW.
3. Insert the power adapter of the FREECOM FS-1 CD-RW into a power socket.
4. Connect the USB-2 connector of the cable to your notebook or computer.
5. You can now start with the software installation.

Note: You can plug the USB-2 cable into your computer and unplug it while the computer is running ("hot plug & play"). Remove the USB-2 cable from the computer when doing so, never remove the USB-2 cable from the drive when the power of the notebook or computer is on.

1.1 USB driver installation

Your FREECOM FS-1 CD-RW is fully backwards compatible with USB 1.1. The installation for USB 1.1 is the same as described below for USB-2.

1.1.1 Driver Installation under Windows ME / 2000 / XP

Under Windows ME/2000/XP a separate FREECOM driver is not required. The drivers for Windows ME, Windows 2000 and Windows XP will be installed automatically by the operating system after plugging in the FREECOM FS-1 CD-RW into the USB port of the computer.

1.1.2 Driver installation under Windows 98 SE

1. Insert the FREECOM driver Disk for Windows 98 SE into the Floppy Disk Drive.
2. Connect your FREECOM FS-1 CD-RW to the USB connector of your notebook or computer.
3. The "Add New Hardware Wizard" opens and a "USB 2.0 Device" (USB-2 Host Controller) or a "USB2-IDE Controller" (USB 1.1 connector) is found.



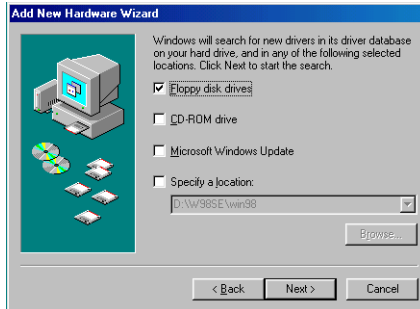
Click on "Next".

4. In the next window select "Search for the best driver for your device. (Recommended)".



Click on "Next".

5. Make sure that the checkbox "Floppy disk drives" is activated in the next window.



Continue by clicking on "Next".

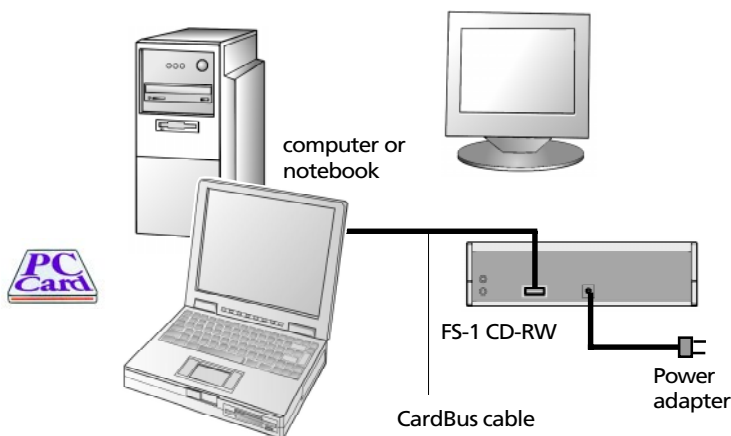
6. The Hardware Wizard finds a "FREECOM USB-2 Drive".



By clicking on "Next" the necessary files will be installed. Afterwards click on "Finish" to complete the installation.

Congratulations! You've just finished to install the FREECOM FS-1 CD-RW and the drive is almost ready to use. Right now the drive is recognized as a CD-ROM drive in "My Computer". To burn CDs you need to install the included CD-Recording software (see chapter 3).

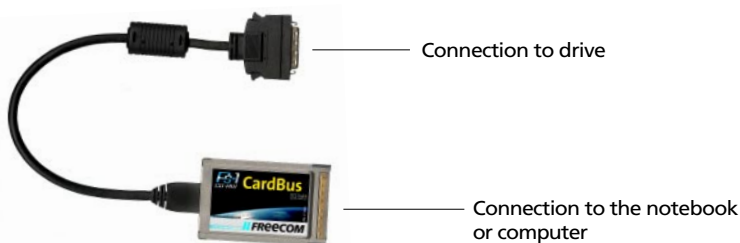
CHAPTER 2: FS-1 CD-RW CardBus version



1. Turn off your notebook or computer and all the equipment connected to it.
2. Connect the included power supply cable to the rear panel of the FREECOM FS-1 CD-RW.

Do not yet plug the power supply into the power outlet.

3. Connect the drive plug of the CardBus cable to the FREECOM FS-1 CD-RW.
4. Attach the other connection on the CardBus cable to your notebook or computer. Following this, plug the power supply of the FREECOM FS-1 CD-RW into a power outlet.
5. Turn on your notebook or computer again.
6. You can now begin installing the software.



2.1 "Plug&Play" with the CardBus cable for Windows 98 / ME / 2000 / XP

To use the FREECOM FS-1 CD-RW for Windows, primary installation must be carried out only once, according to the following software installation.

The Cardbus cable is Plug&Play compatible. When working with Windows, you can attach the CardBus while the drive is in use. Your FREECOM FS-1 CD-RW then appears under *"My Computer"*. Likewise, the CardBus can be removed while the drive is in use, by first cancelling it. The FREECOM FS-1 CD-RW then disappears from *"My Computer"*. To cancel the CardBus, click on *"Start"*, *"Settings"*, *"Control Panel"*, *"CardBus"*. Highlight the CardBus cable and click on *"Stop"*. The CardBus cable can be removed when the command *"You may now safely remove the card"* appears.

2.2 CardBus driver installation

2.2.1 Driver installation under Windows 98

To install the FREECOM driver, insert the FREECOM installation diskette in your floppy drive.

1. Plug the FREECOM CardBus cable into the CardBus slot of your notebook or computer.
2. The window "Hardware Installation Wizard" opens. The FREECOM CardBus cable is recognized as "PCI Mass Storage Controller". Confirm with "Next" to continue the installation.

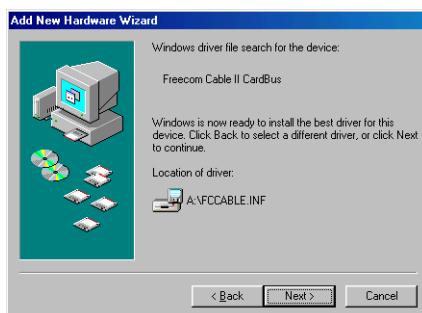


3. In the next window the option for finding the best driver for the device has been selected. Confirm with "Next".

4. In the next window select the floppy drive to install the FREECOM driver. Click on "Next".



5. The driver is loaded from the diskette. Click on "Next" to continue the installation.



6. In the next window click on "Next" to confirm the installation.
7. Please reboot your computer, if you are asked for it. Your FREECOM FS-1 CD-RW drive appears with a new drive letter under "My Computer". The installation is then complete.

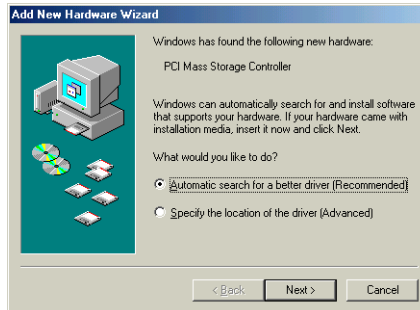
Uninstalling the FREECOM driver

To uninstall the FREECOM driver, select the file "DriverRemove.exe" on the installation diskette and follow the on-screen instructions.

2.2.2 Driver Installation under Windows ME

To install the FREECOM driver, insert the FREECOM installation diskette in your floppy drive.

1. Plug the FREECOM CardBus cable into the CardBus slot of your notebook or computer.
2. The window "Hardware Installation Wizard" opens. The FREECOM CardBus cable is recognized as "PCI Mass Storage Controller". Confirm with "Next" to continue the installation.



3. Windows ME automatically detects and installs the FREECOM driver from diskette.
4. After completion of the installation, click on "Finish". Please reboot your computer, if you are asked for it. Your FREECOM FS-1 CD-RW drive appears with a new drive letter under "My Computer". The installation is then complete.



Uninstalling the FREECOM driver

To uninstall the FREECOM driver, select the file "DriverRemove.exe" on the installation diskette and follow the on-screen instructions.

2.2.3 Assigning the drive letter under Windows 98 / ME

After successfully completing the installation of the FREECOM FS-1 CD-RW, a new drive letter is assigned automatically (the first available letter after the internal hard drives). This can shift the drive letter of an internal CD-ROM drive (for example, 'D' to 'E'). If this leads to problems, it is possible to change the drive letter assignment as follows:

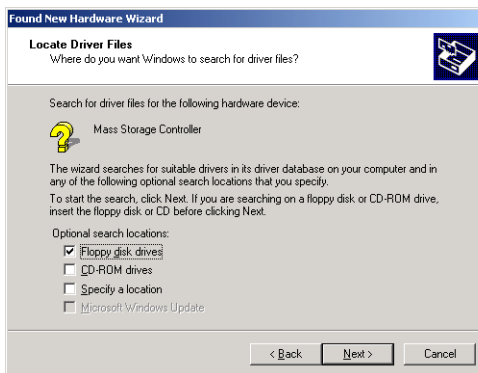
1. Click on *"Start"* - *"Settings"* - *"Control Panel"*.
2. Click on *"System"*.
3. Select *"Device Manager"* and click on *"CD-ROM"* or *"Drive"*.
4. Click on the FREECOM FS-1 CD-RW, then on *"Properties"* - *"Settings"*. (The currently assigned drive letter as well as the reserved drive letters will then be displayed.)
5. Under *"Reserved Drive Letter"* enter a drive letter, for example "F" for the FREECOM FS-1 CD-RW as the *"First drive letter"* and "F" again as the *"Last drive letter"*.
6. Confirm your selection with *"OK"*. When you restart your computer, the FREECOM FS-1 CD-RW will be assigned the letter F in *"My Computer"*.

2.2.4 Driver installation under Windows 2000 / Windows XP

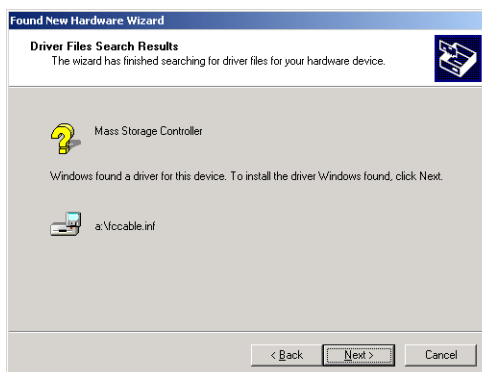
1. To install the FREECOM driver, insert the FREECOM installation diskette in your floppy drive.
2. Plug the FREECOM CardBus cable into the CardBus slot of your notebook or computer.
3. The window "Hardware Installation Wizard" opens. After confirmation with "Next" the FREECOM CardBus cable is recognized as "PCI Mass Storage Controller".
4. In the next window, the default option for finding a suitable driver for the device is selected. Confirm with "Next".



5. (only Windows 2000) Select the floppy drive or the CD-ROM drive to install the FREECOM driver. Click on "Next".



6. (only Windows 2000) The driver is loaded from the diskette. Click on "Next" to install the driver.



7. (only Windows 2000) If a message appears that no digital signature from Microsoft Windows has been found, confirm with "Yes".
8. Confirm completion of the software installation in the window that opens by clicking on "Finish". Please reboot your computer, if you are asked for it. Your FREECOM FS-1 CD-RW now appears with a new drive letter under "My Computer". The installation is then complete.

Uninstalling the FREECOM driver

To uninstall the FREECOM driver, select the file "DriverRemove.exe" on the installation diskette and follow the on-screen instructions.

CHAPTER 3: Installing the CD Recording Software

After installing the cable driver software, your FREECOM FS-1 CD-RW drive is now able to read CD-ROMs.

To record a blank CD, you must first install the CD Recording software (refer to the mastering or the packet writing procedure). We recommend using the software which has been provided with your drive.

The installation guide for the software is supplied with the CD. After installation, the drive is fully operational.

Note: If you wish to use other software, please find out from the supplier whether his products support the FREECOM FS-1 CD-RW .

3.1 Special Instructions before writing a CD

- You should realize that writing CDs is principally a sensitive data transmission procedure which can be disrupted by even the smallest mechanical disturbance.
- Never clean the CD-R/CD-RW with a commercially available CD-ROM cleaning set. This can damage the drive.
- Recordable and Rewritable CDs (blanks) are more sensitive than commercially available CDs. Use only a solvent-free, non-abrasive marker when writing on a CD.
- Do not stick any conventional labels on the CD-Rs/CD-RWs, since the adhesive can attack the medium. Special labels for CD-R/CD-RW media are available in retail computer stores. Never remove a label from a CD-R/CD-RW media otherwise you will damage the protective layer and make the CD-R/CD-RW unusable.
- The drive recognizes the medium as soon as it is placed into the drive. CD-R/CD-RW media are compatible with the vast majority of CD-ROM drives and CD audio players and work in most DVD-ROM drives.

Recommendation: For optimal results, use FREECOM blank CDs.



3.2 Preparing to write a CD

Before creating a CD:

1. By clicking "Start" - "Programs" - "Accessories" - "System Tools" - "Scandisk" check your hard disk with the Scandisk program.
2. By clicking "Start" - "Programs" - "Accessories" - "System Tools" - "Disk Defragmenter" defragment your hard disk.

other preparations:

- No sleep mode / no multitasking
- Close all open windows and other running programs (Anti Virus)
- Deactivate automatic recognition of CDs
(in the Device Manager under Windows 98/ME/2000)
- Deactivate the screen saver
- Log out of the network before starting the writing procedure (if applicable)
- Deactivate your modem

3.3 Procedure for writing CDs

There are two procedures for creating and writing your CDs.



3.3.1 The Mastering procedure

is a process for creating data CDs and Audio CDs. Data is compiled onto a "Master CD" in one (single session) or several (multisession) writing procedures. During these procedures, the data is made compatible according to various industry norms, allowing for example audio CDs to be read by any CD player. The standards for new technology (for CD, video etc.) are prepared for data storage in special readable formats. Special programs such as "Easy Creator", "WinOnCD", "CEQuadrat ToGo!", "Nero Burning ROM" are necessary to convert data into these specified formats. These types of programs are necessary for writing data CDs in ISO 9660 and Joliet formats as well as for writing audio CDs, Mixed Mode CDs and Photo CDs.

Note: Data CDs in Joliet format are only readable under Windows 95, 98, ME, NT 4.0, 2000 and XP.

3.3.2 The Packet Writing procedure

can be used to create CDs without starting a special mastering program. The Packet Writing procedure allows to use blank CDs in combination with the Universal Disc Format (UDF) as an additional hard disk or floppy disk. Standard software for packet writing e.g. "Direct CD" (Roxio), "InCD" (Nero Burning ROM). Afterwards the writing procedure can be started.

Files can be written directly from any Windows application (e.g. Microsoft Word) to the CD using the same procedure as writing to the hard disk. Files can also be copied to CD using the Windows Explorer.

Note: We recommend using the software which has been provided with your drive. If you wish to use other software, please find out from the supplier whether his products support the FREEDOS FS-1 CD-RW .

Afterwards the writing procedure can be started by simply dragging the file to be written in the Explorer/File Manager (Drag&Drop Principle), assuming there is a UDF-formatted blank disk in your CD-RW drive.

A medium can only be written once with the CD-R drive and previously written files can be deleted but not overwritten. The great advantage of the CD-RW drive in conjunction with a CD-RW medium is that it allows to rewrite the medium.

Note: Please note that the mastering procedure and the packet writing procedure can only be used separately, therefore a mixing of these procedures on one CD-RW is not possible.

3.4 Peculiarities when writing audio CDs

Please note that some older CD player models principally cannot read self-written CDs.

Note: Audio files must have the proper format (stereo, 16 bit and 44.1 Hz sampling frequency) and must be supported by the CD recording software, for example, *.wav. Some programs offer conversion functions. Soundcards and the software that come with them can also be used. Please note that *.wav files cannot or have supported formats such as: mono, 8 bit.

CHAPTER 4: Troubleshooting

General problems

If you still have problems getting your FREECOM FS-1 CD-RW to function properly despite having installed it correctly, then please check whether

- the cable is properly connected to your FREECOM FS-1 CD-RW
- the FREECOM FS-1 CD-RW is being supplied with power
- the tray can be opened and closed
- your system meets the hardware requirements (see pages 5/6)

Note: If the FREECOM FS-1 CD-RW is supplied with power via the Card Slot of the computer, first use the enclosed power cord if problems arise.

Should your notebook or computer cause problems when attempting to install software,

- do not use any memory manager such as QEMM
- disable the systems Power Management
- check if all the requirements contained in the instructions on the disk have been fulfilled
- check if the FREECOM FS-1 CD-RW is properly connected to the cable
- check if the FREECOM FS-1 CD-RW is being supplied with power when you boot your system

If audio playback does not work, please check if

- the loudspeaker is properly connected
- the FS-1 cable is firmly connected
- the loudspeaker control on the amplifier or on the active loudspeakers is correctly set
- the audio software is correctly installed

Note: Please note that CD-RW drives (FREECOM FS-1 CD-RW) must never be cleaned with a lens cleaning set!

FREECOM Internet Service

FREECOM Technologies makes the following service available in the Internet under **www.freecom.com**

- Online information about technical problems
- current product information
- Drivers, driver updates and software information
- Forum

Support Hotline

The following hotlines are available if you still are unable to get your FREECOM FS-1 CD-RW to work properly after reading the manual and the suggestions for troubleshooting:

	Hotline	Email
Deutschland & Österreich	+49 (0) 20 37 68 09 50	supportde@freecom.com
België (NL)*	0 78 25 00 00	supportnl@freecom.com
Belgique (F)*	0 78 25 00 01	supportnl@freecom.com
Belgien (D)*	0 78 25 00 02	supportnl@freecom.com
France	+33 (0) 1 34 04 72 05	supportfr@freecom.com
Nederland	+31 (0) 1 58 88 01 10	supportnl@freecom.com
Schweiz (D)	+41 (0) 8 48 88 99 10	supportde@freecom.com
Suisse (F)	+41 (0) 8 48 88 77 10	supportfr@freecom.com
United Kingdom & Ireland	+44 (0) 14 23 70 47 15	supportuk@freecom.com
other countries	+31 (0) 1 58 88 01 10	supportint@freecom.com

* (alléén in België/seulement pour la Belgique/nur in Belgien)

If possible, try to call from a phone near your computer.

Please have the following information on hand for your call:

- the serial number on the rear side of your FREECOM FS-1 CD-RW and the serial number of the FS-1 cable
- the revision number of the cable driver disk
- information on the power supply
- the version number of your operating system and the software you are having problems with
- the precise error description or error message displayed
- the name and the model of your notebook or computer and, in case it is needed, the installed hardware
- Is the problem reproduced every time?
- Has this problem occurred before? If not, have you recently changed your system configuration?

CHAPTER 5: Glossary - List of keywords

Audio CD

See CD-DA

Bridge Disk

CDs which can be read by CD-ROM/XA drives and CD-I players, for example a Kodak Photo CD.

Blue Book

Specification for CD-Extra (formerly CD-Plus)

Buffer underrun

When the write memory of the drive is empty, the writing procedure will be terminated. The flow of data from the system to the drive was insufficient. Either the transfer is too low for the writing speed or the data flow was interrupted.

CD-DA

CD-DA stands for "CD Digital Audio" and is the known audio CD standard described in the Red Book. It contains audio data – that is to say music – and can be played back in CD-ROM drives which support audio CDs as well as in normal CD players in stereo systems.

The audio data is stored as so-called "frames" with a length of 1/75 of a second. 44,100 audio signal samples are stored per second. Each sample uses two bytes (16 bit), and two channels are stored (left and right). This results in a sector size of $44,1000 \times 2 \times 1/75 = 2352$ bytes per frame which corresponds to the size of a physical block on a CD.

CD-I

CD-Interactive, special CD format defined in the Green Book The CD-I track is not entered into the TOC (CD directory). Thus, the audio tracks can be listened to on a normal CD player. To access a CD-I track, an appropriate drive is required. Some older CD players incorrectly recognize the CD-I track as an audio track and attempt to play it back accordingly.

CD-R

CompactDisc-Recordable, designation for recordable CDs.

CD-ROM (Single and Multisession)

CD-ROM describes a CD which contains computer data much like a hard disk.

CD-XA

XA stands for "Extended Architecture" and is a standard for Multimedia CDs containing audio and computer data.

Defragmenting

A hard disk can be defragmented using the DOS command 'defrag' or a similar tool from other operating systems. Due to the fact that files are constantly deleted and new ones written to the hard disk, files are no longer grouped together in physically contiguous blocks but instead are scattered, i.e. fragmented, over the entire hard disk. Defragmentation rewrites the files so that they are "put back" together again. This does not affect the directory structure or the data contents. The advantage of defragmentation is that it allows files to be accessed quicker by simplifying the searching process. We strongly recommend defragmenting your hard disk before writing a CD.

Disc-at-Once

Not all drives support the procedure of writing a CD in a single process. As soon as the disc/CD is complete, it can no longer be written to (single session CD).

EPP

EPP stands for Enhanced Parallel Port and refers to an extended standard of the parallel interface which allows higher data transfer rates and makes it possible to connect several devices.

ECP

stands for Extended Capability Port and is a more powerful version of the EPP.

Finalising/ End disc / Close disc

Completely finishing a CD. Necessary (according to Red Book regulations) for audio CDs which cannot be read by normal reading devices (CD players) if they have not been finalised. Also, the definitive end of a data CD. It is not possible to write anything else on a finalised CD.

Finalization consists of a lead-in and a lead-out (as with fixing) with a final table of contents. Because only one lead-in and one lead-out are permitted on an audio CD, any fixing here will automatically finish the CD.

Fixing

Writing a lead-in and lead-out area for a session. This concludes the session. All data from the session and from any previous sessions can be read by normal CD-ROMs. This process requires an enormous amount of space, using up approximately 15 MB. This space is definitively lost for other recordings. This means that less data can be written on multisession CDs than on single session CDs.

Green Book

Specification for CD-I.

High Sierra/High Sierra Format

The Hotel in Nevada, USA where in 1985 the foundation was laid for determining the file systems for CDs. The efforts of the group which came to be known as the "High Sierra Group" led to the standard ISO 9660, the most common file system for CDs. A CD that conforms to this standard is at times still referred to as a "High Sierra" CD. The original High Sierra format has almost died out; as a rule, ISO 9660 is used instead.

Image File

see physical image

ISO 9660

ISO 9660 describes the requirements a CD file system has to fulfill. This allows a CD to be used universally.

Only the capital letters from A to Z, the digits 0 to 9 and the underscore symbol are permitted for file and directory names. Diacritical marks (Ä, Ö, Ü), foreign characters and punctuation marks (ß, ?, ! etc.) as well as hyphens are not permitted. The filename can have a max. of 8 characters, the extension only up to 3. The filename must be at least one character in length, for example 'A'. A version number (1 to 32767) can be appended (for example 'A.B;1'). A maximum directory hierarchy of eight levels is permitted whereby the root is considered the first level. The ISO 9660 employs specifications of the High Sierra Group and is for that reason also called the High Sierra format. There are also other file systems (for example HFS for Apple Macintosh) which, however, can only be recognized on these types of systems.

Joliet

CD file system that supports long filenames and can be used under Windows 95/98/ME/2000/XP. For full compatibility to DOS, an ISO 9660 file system must be created. This is a part of the complete Joliet system.

Lead-In

The lead-in is a data area at the beginning of a CD-R session. This area contains the directory (table of contents TOC) of a session. The lead-in is written together with the lead-out of a session. Every lead-in uses 4500 sectors (approx. 9 MB) on the CD.

Lead-Out

The lead-out marks the physical end of a session and does not contain any data. It is written together with the lead-in. The first lead-out of a CD uses 6750 sectors (approx. 13 MB), all following ones 2250 sectors (approx. 4 MB).

Mixed Mode CDs

A CD which contains both computer data and audio data is known as a Mixed Mode CD. The computer data is stored on the first track. All the other tracks contain audio data. Modern CD players do not reproduce the first track. Older models, however, will try to "play back" the computer data which, in some cases, can cause damage to the stereo system.

Multisession

A data CD can be written in several sessions. This must be set accordingly while writing. Typical instances where multisession CDs are used are regular backups and Photo CDs which are gradually filled up.

Multitasking

Windows allows you to run several programs simultaneously. This is known as multitasking. When writing CDs, only the CD recording software window should be open (running), for full and exclusive use of the computer's resources. Screen savers, modems and network functions should be deactivated as they all use up computer resources which, in extreme cases, may disrupt the writing process.

On-the-Fly

Writing directly onto a CD-R without creating a physical image. If it is not possible to gain fast access to the source files, the writing process cannot be carried out successfully ("Buffer Underrun"). Only small amounts of data with simple data structure should be written On-the-Fly. The source files should be copied onto the hard disk.

Orange Book

The Orange Book contains the specifications for CD-R (recordable CDs). These CDs contain no information other than some special data (ATIP Codes), and they can be written according to any of the other color book standards. Manufacturers of blank CDs have to abide by the regulations in the Orange Book.

Packet Writing

The packet writing method enable to write data on CDs in smaller blocks (packets) than with the usual Track-at-Once or Disc-at-Once procedures. This procedure allows data blocks to be written onto the CD-R without having to finish the particular track. A further advantage of Packet Writing is the simple updating of existing files. Data can be simply added without having to rewrite the file directory each time.

Physical Image

Before writing a CD, an identical 1:1 copy of the new CD is created on the hard disk. The file will be the size of the record (i.e. up to 650 MB). Creating a physical image requires a certain amount of processing which is not necessary for writing. For the writing procedure, only the file to be written is transferred. The CPU load (Central Processing Unit) remains small and cannot cause disruption. When creating several identical CDs, the physical image is less time-consuming because the processing mentioned above only has to be carried out once.

"Raw" Files

A "raw" file contains data which is already in CD format. It can be directly written without further modification. One "raw" file corresponds to one track. For example, a "raw" audio file can be used as the contents of one CD-DA track. Image files are "raw" files.

Red Book

Specification for audio CDs.

Session

CDs are separated into tracks and sessions. One session (or "sitting") consist of files, which are recorded in a process. It contains one or more tracks. A session can only consist of one data track, but several audio tracks.

Single session

The CD is recorded in one session (or "sitting"). Audio CDs are always single session CDs.

Thermal Calibration

Procedure for adapting hard disks to the effects of thermal expansion. The hard disk cannot be accessed while it is calibrating. This can be a sufficient amount of time to empty the driver's buffer space. This leads to a 'buffer underrun' which will interrupt the writing procedure and will render the blank disc unusable. It is not possible to control the moment at which calibration takes place. If no calibration occurred beforehand but happens during writing, even a test-run of the drive can occur. This type of hard disk is unsuitable as a source drive (or for physical and virtual images).

TOC

Table of Contents, Directory of the CD. The table of contents documents not only the number of tracks but also their starting position and the total length of the data area of the disc.

Track

a track is a section of the CD. Every audio title has its own track. In contrast, all the data of a data CD is contained within a single track. A Mixed-Mode CD has a data track (track 1) and audio tracks. The data track cannot be played back with an audio player. Older devices can produce a whistling sound which can damage your stereo system. The data track for CDs conforming to the Blue Book standard (CD-Extra, CD-Plus) is located at the end of the CD.

Track-at-Once

"Track-at-Once" is a method of writing by which all tracks are written individually. For data CDs there is no significant difference to "Disc-at-Once"; however, a gap of two seconds is appended to every track of an audio CD. Some CD recorders can only write according to this method.

Virtual Image

The data structure of a CD is different to those of other media. The writing program must first convert the data in to an appropriate form before it sends it to the recorder. The virtual image is constantly updated during the writing procedure. This requires a computer system with enough power to handle the complexity of the data. The virtual image requires approx. 30MB of free hard disk space. It is automatically deleted after the writing procedure. Writing with virtual images is also known as "On-the-Fly." If problems occur (insufficient data transfer rates), you should use physical images to separate the image creation and data transfer/writing processes.

Yellow Book

Specification for CD-ROM (data CDs) and CD-ROM XA.