

CD Glossary

A

a-characters

The character set used in the ISO 9660 Volume Descriptors. It consists of capital A to Z, digits 0 to 9, and the following symbols: (space) ! " % & ' () = * + , - . / : ; < ? > _

A-Time

(or absolute time) In an audio CD, the time elapsed since the beginning of the disc. It can be used in determining the start and stop times of sound segments for programming an application on a mixed-mode disc, measuring from the very beginning of the data area (including the computer data in Track 1).

Aspect Ratio

An image's width to height ratio.

ASPI

Advanced SCSI Programmer's Interface. A layer of code which manages communication between software and SCSI cards.

Authoring

What you do to create an application which may eventually be stored on CD. For example, if you wish to create a multimedia game or presentation, you will need authoring software that allows you to combine sound, graphics, and text with user interactivity. When you have finished creating your application with authoring software, you can use CD recording software such as Easy CD Creator or Toast to write it to CD.

Auto-Insert Notification

A feature of Windows operating systems which causes an audio CD to be played or an application disc to launch an application (for some discs) as soon as the disc is mounted in a CD drive. With earlier CD-R software it was recommended that this feature be turned off, but with Easy CD Creator and DirectCD it is preferable to leave it on. This setting must be made for each CD unit separately; in Windows 95 it can be made in Control Panel | System | Device Manager | CD-ROM | [your CD-ROM drive] | Settings

B

Barcode

A unique code for a compact disc. With recordable CDs, this number is often printed in the clear inner ring of the disc. Some CD recorders can also read this information digitally.

Block

See sector.

Bootable

A CD (or floppy, hard disk, or other storage media) from which a computer can be started up, because it contains all the operating system software the computer needs to run. A bootable CD contains a bootable image - a file which is an exact representation of a boot floppy or hard drive. Bootable CDs are usually made according to the El Torito standard.

Buffer

An amount of memory which temporarily stores data to help compensate for differences in the transfer rate of data from one device to another. In CD recorders, the buffer helps to prevent buffer underruns.

Buffer Underrun

A buffer underrun occurs when your computer system cannot keep up the steady stream of data required for CD recording. The CD recorder has an internal memory buffer to protect against interruptions and slowdowns, but if the interruption is so long that the recorder's buffer is completely emptied, a buffer underrun occurs, writing stops, and most often the recordable CD is ruined. See also About Buffer Underruns.

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C

Caddy

The plastic and metal carrier into which a CD must be inserted before it is loaded into some CD-ROM drives or CD recorders (others have a tray which slides out to receive the disc, and do not need caddies).

CD Bridge

A set of specifications defining a way of recording CD-I information on a CD-ROM XA disc. Used for Photo CD and Video CD.

CD Extra or CD Plus

A multisession disc containing a number of audio tracks in the first session, and one CD-ROM XA data track in the second session. Additional characteristics are defined in the Blue Book standard. An alternative to mixed-mode for combining standard CD-DA audio (which can be played in a normal audio player), and a computer application, on a single disc.

CD+G

(aka karaoke) A special disc format in which simple graphics and text are stored in the subchannels of an audio disc, but you need a special player to read and display this information. The data in the subchannels cannot be copied with most current systems or software.

CD-DA

Compact Disc-Digital Audio. Jointly developed by Philips and Sony and launched in October, 1982, CD-DA was the first incarnation of the compact disc, used to digitally record and play back music. The standard under which CD-DA discs are recorded is known as the Red Book.

CD-I

A compact disc format developed by Philips, designed to allow interactive multimedia applications to be run on a player attached to a television. The standard document defining CD-I is called the Green Book.

CD-R

Compact disc-recordable. When referring to recordable discs (media), "CD-R" is often used to refer to write-once discs, in contrast to CD-RW. See also Recordable Disc.

CD-ROM

Compact Disc-Read Only Memory. A standard for compact disc to be used as digital memory media for personal computers. The specifications for CD-ROM were first defined in the Yellow Book.

CD-ROM Drive

A peripheral device attached to a computer which allows it to read/play a CD-ROM disc. All CD-ROM players can also play back audio CDs, but you need external headphones or speakers to hear them.

CD-ROM XA

"XA" stands for Extended Architecture. CD-ROM XA is an extension of the Yellow Book standard, generally consistent with the ISO 9660 logical format but designed to add better audio and video capabilities (taken from the CD-I standard) so that CD-ROM could more easily be used for multimedia applications. CD-ROM XA was abandoned as an independent multimedia format, but Photo CD discs are written in the CD-ROM XA physical format.

CD-RW

CD-ReWritable. CD recordable media which can be erased and re-recorded. CD-RW media can only be written in a CD-RW recorder, not in a normal CD recorder, though a CD-RW recorder can also record standard CD-R discs. More information on the read-back compatibility of CD-RW discs.

CD Text

An audio CD format in which up to 5000 characters of disc information (title, artist, song titles, etc.) is written into the disc Table of Contents. This information is displayed when the disc is played back on CD Text-enabled players.

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CD-WO

Compact Disc-Write Once. A rarely-used term for recordable compact disc.

Close Disc

To "close" a recordable disc so that no further data can be written to it. This is done when the last session's lead-in is written. The next writeable address on the disc is not recorded in that lead-in, so the CD recorder in subsequent attempts to write has no way of knowing where to begin writing. Note: It is NOT necessary to close a disc in order to read it in a normal CD-ROM drive.

Close Session

When a session is closed, information about its contents is written into the disc's Table of Contents, and a lead-in and lead-out are written to prepare the disc for a subsequent session.

Coaster

Popular term for a ruined recordable CD, named after the round object you rest your drinking glass on so that it doesn't mark the table.

Cue Sheet

In Easy-CD Pro for Windows 3.1, a list of tracks which will be written one after the other in the same session without user intervention. Generally used to create multi-track audio or mixed-mode discs.

D

d-characters

The character set used in ISO 9660 Level 1 filenames, if the standard is strictly adhered to (which is not always necessary). Consists of capital A to Z, digits 0 to 9, and the underscore symbol (_).

DAT

Digital Audio Tape.

Data Area

In ISO 9660, the space on a CD-ROM where the user data is written. It begins at the physical sector address 00:02:16.

Digital Audio Extraction

The process of copying CD-DA audio tracks digitally, from your CD recorder or CD-ROM drive, to hard disk or to recordable CD. Not all CD-ROM drives support this (but most CD recorders do)! For more information.

Disc-at-Once

A method of writing CDs in which one or more tracks are written in a single operation, and the disc is closed, without ever turning off the writing laser. Contrast with Track-at-Once. Not all CD recorders support Disc-at-Once. For more information.

Disc Image

A single large file which is an exact representation of the whole set of data and programs as it will appear on a CD, in terms of both content and logical format. This may be an ISO 9660 image (adhering strictly to the ISO 9660 standard), or some proprietary format such as the .cif format used by Easy CD Creator.

E

EAN

See UPC.

ECC

Error Correction Code. A system of scrambling data and recording redundant data onto disc as it is recorded. During playback, this redundant information helps to detect and correct errors that may arise during data transmission.

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EDC

Error Detection Code. 32 bits in each sector which are used to detect errors in the sector data.

EnhancedCD

See CD Extra.

Extent

A sequential set of sectors in which a file or portion of a file is recorded.

F

File System

A data structure that translates the physical (sector) view of a disc into a logical (files, directories) structure, which helps both computers and users locate files. In other words, it records where files and directories are located on the disc. See also Logical Format.

Firmware

In a CD recorder, firmware is the programming instructions contained on a ROM chip within the CD recorder which tell the recorder how to respond to commands issued by software. Some firmware is flash-upgradeable, meaning that you can upgrade the firmware by running a piece of software on the computer attached to the recorder. Other firmware is coded into non-rewriteable chip, so the entire chip must be changed in order to upgrade the firmware.

FPS

Frames per second.

Frame

A single, complete picture in a video or film. A video frame is made up of two interlaced fields of either 525 lines (NTSC) or 625 lines (PAL). Full-motion video for NTSC runs at 30 frames per second (fps); for PAL, 25 fps. Film runs at 24 fps.

G

Gap

The gap (more correctly called a pause) is a space dividing tracks on a CD. In some situations a gap is required by the standards (Red Book and other "color" books). For example, if you have data and audio tracks within the same session, they must be separated by a gap. Also, there must be a gap of 2 to 3 seconds preceding the first track on a disc. The gap which "belongs" to a track is actually the gap before it, not the one after it. This is why on some audio CD players you will see a countdown (-02, -01, etc.) before a track begins - it's counting down to the next track, not counting up from the end of the last one.

H

Header Field

Four bytes recorded at the beginning of each sector which tell the address of the sector (expressed as a Logical Block Number) and the mode in which the sector is recorded.

HFS

The file system used by the Macintosh operating system to organize data on hard and floppy disks. Can also be used for CD-ROMs.

High Sierra Format

The standard logical format for CD-ROM originally proposed by the High Sierra Group, on which the ISO 9660 standard is based; essentially identical to ISO 9660. The original High Sierra format is no longer used.

Hybrid

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Under the Orange Book standard for recordable CD, hybrid means a recordable disc on which one or more sessions are already recorded, but the disc is not closed, leaving space open for future recording. However, in popular use the term “hybrid” often refers to a disc containing both DOS/Windows and Macintosh software, which on a DOS/Windows platform is seen as a normal ISO 9660 disc, while on a Mac it appears as an HFS disc.

I

Indexes

Indexes provide additional starting points within a single audio track. Not all audio CD players support indexes. Index markers are written into the Q subchannel and are incremented by 1 sequentially during the track.

ISO 9660 Format

The most common international standard for the logical format for files and directories on a CD-ROM. Some other common logical formats such as Joliet and Rock Ridge are extensions of ISO 9660.

ISO 9660 Image

See disc image.

ISO 9660 Interchange Levels

Methods of recording and naming files on disc under the ISO 9660 standard. There are three nested, downward-compatible Levels. In Level 1 (the lowest common denominator, developed with DOS file naming limitations in mind):

Each file must be written on disc as a single, continuous stream of bytes — files may not be fragmented or interleaved.

A filename may not contain more than eight d-characters.

A Filename Extension may not contain more than three d-characters.

A directory name may not contain more than eight d-characters.

In Level 2, again, each file must be written on disc as a single, continuous stream of bytes, but there are no restrictions on filenames.

In Level 3 there are no restrictions at all. This allows for writing files in multiple extents, so it is used for packet writing.

ISRC

International Standard Recording Code. Some recorders allow the ISRC to be recorded for each audio track on a disc. The code is made up of: Country Code (2 ASCII characters), Owner Code (3 ASCII characters), Year of Recording (2 digits), Serial Number (5 digits).

J

Jewel Case

The hinged plastic case in which CDs are often stored.

Joliet

Joliet is an extension of the ISO 9660 standard, developed by Microsoft to allow CDs to be recorded using long filenames, and using the Unicode international character set. Joliet allows you to use filenames up to 64 characters in length, including spaces. For more information.

L

Lead-In

An area at the beginning of each session on a recordable compact disc which is left blank for the session's Table of Contents. The lead-in is written when a session is closed, and takes up 4500 sectors on disc (1 minute, or roughly 9 megabytes). The lead-in also contains next writeable address on the disc, so that future sessions can be added (unless the disc is closed).

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Lead-Out

An area at the end of a session which indicates that the end of the data has been reached. The first lead-out on a disc is 6750 sectors (1.5 minutes, about 13 megabytes) long; any subsequent lead-outs are 2250 sectors (.5 minute, about 4 megabytes).

Link Block

A block (aka sector) of digital rubbish which is written each time the recording laser is turned on (before) or off (after) writing a track or a packet. See also Run-in/Run-out Blocks.

Linked Multisession

A disc containing more than one session, in which all (or selected) data from the various sessions can be seen as if it had all been recorded in a single session. For more information.

Logical Block

The smallest addressable space on a disc. Each logical block is identified by a unique Logical Block Number (LBN), assigned in order starting from 0 at the beginning of the disc. Under the ISO 9660 standard, all data on a CD is addressed in terms of Logical Block Numbers.

Logical Format / Logical Structure / File System

A file system such as ISO 9660 translates the sector-by-sector view of a compact disc into a virtual "tree" of directories and files, which makes it easier for both humans and computers to use the information on the disc. UDF is another example of a file system which can be used to write CDs.

M

Mastering

Technically, refers to the process of creating a glass master from which compact discs will be reproduced in quantity. In desktop recordable CD systems, mastering is done together with premastering by the desktop CD recorder, and the term is generally used to mean "recording."

Mixed-Mode Disc

A compact disc including both computer data and CD-DA tracks. The data is all contained in Track 1, and the audio in one or more following tracks. Contrast with CD Extra.

MMC

A standard command set used by some CD recorders. Many newer recorders follow this standard, though many of them also interpret it differently (so there are still differences in how software must address these recorders, in spite of the standard).

Mode 1

A somewhat inaccurate way of referring to the CD-ROM physical format. More information.

Mode 2

A not-quite-accurate but common way of referring to the CD-ROM XA physical format. More information

Mount

To install a compact disc so that the computer recognizes its presence and can read data from it.

MP3

MP3 is a scheme for compressing audio. MP3 files do not maintain the quality of audio CD tracks, and cannot be recorded directly to CD as standard audio tracks. They can be recorded as data tracks and played back via your computer using an appropriate player software, or converted to Wave files and then recorded to CD.

MPEG

Motion Picture Experts Group, a standards organization responsible for the MPEG1 and MPEG 2 standards for the compression of full-motion video.

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MSCDEX

Microsoft DOS extensions for CD-ROM. Allows the DOS and Windows 3.x operating systems to recognize a CD-ROM disc.

MultiRead

An OSTA standard for CD-ROM and DVD-ROM drives. Drives which follow the MultiRead standard can read commercial CDs (audio and data), CD-R discs, and CD-RW discs. They can also read discs written in fixed- or variable-length packets. For more information, see the MultiRead Specification.

Multisession

A method of adding data incrementally to a CD in more than one recording session. If data is linked between session, all data on a multisession disc, when read on a multisession CD-ROM drive, may be seen as part of a single logical structure. Multisession is very different from packet writing. For more information.

Multivolume

A disc containing multiple sessions which are not linked together, so that each "volume" on the disc must be read as if it were a separate disc. You can read different sessions on a disc using the Session Selector in Easy CD Creator Deluxe.

N

NTSC

The standard used for broadcast television in the U.S., whose resolution is 525 horizontal lines at 30 frames per second.

O

On the Fly

To write on the fly means to write directly from source data to CD data without first writing a disc image.

Optimum Power Calibration Area

(OPC Area) A special area near the center of the recordable disc. Before writing a track on a disc, the CD recorder must adjust the amount of power applied to the writing laser to an optimum level for each individual disc. The optimum calibration area is reserved for this purpose.

Orange Book

The Philips/Sony specification for Compact Disc Magneto-Optical (CD-MO) and Write-Once (CD-WO) systems - in other words, the standard by which recordable CDs are recorded.

P

Packet Writing

A method of writing data on a CD in small increments (contrast with Track-at-Once and Disc-at-Once). Packets can be of fixed or variable length. Adaptec's DirectCD software requires packet writing. For more information.

PAL

Phase Alteration by Line. The standard used for broadcast television in much of Europe and Asia, with a resolution of 768 pixels x 576 horizontal lines at 25 frames per second.

PCA

Power Calibration Area. See OPC.

Photo CD

A compact disc format based on the CD-ROM XA and Orange Book Hybrid Disc specifications, used to store photographic images for display and printing.

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Physical Format

The physical format of a compact disc determines how data is recorded in each sector. The various physical formats are defined by the color book standards (e.g., Red Book, Yellow Book, etc.) For more information.

PMA

(Program Memory Area) On a recordable disc, an area which “temporarily” contains the Table of Contents information when tracks are written in a session which is not yet closed. When the session is closed, this same information is written in the session lead-in.

Premastering

The process of preparing data to be recorded onto a compact disc. This includes dividing the data into sectors and recording those sectors with the appropriate header (address) and error correction information. In the case of recordable CD systems, premastering and mastering are done in one operation, resulting in a ready-to-read compact disc.

Q

QSIF

Quarter-SIF. A format for compressed video with a resolution of 176 (horizontal) x 112 (vertical) x 29.97(fps) for NTSC and 176(h) x 144(v) x 25.00(fps) for PAL. QSIF allows for low data rates suitable for Internet applications.

R

Random Erase

(Available with CD-RW discs and DirectCD for Windows 2.x). The ability to erase a single file at a time from a CD-ReWritable disc, freeing up disc space for immediate re-use, just as you would do on a hard or floppy disk.

Recordable Disc

The media used in recordable CD systems. The blank disc is made of a bottom layer of polycarbonate, with a preformed track spiral which the recording laser follows when inscribing information onto the disc. A translucent layer of recordable material is laid on top of the polycarbonate, then a reflective layer (gold or silver colored). On top there is a thin layer of lacquer and sometimes a printed label. The standard recordable disc is “write-once” — data written to it cannot be erased, although it is possible to add data in a later session (see Multisession). For erasable/rewritable discs, see CD-RW.

Red Book

The Philips/Sony specification for audio (CD-DA) compact discs.

Rock Ridge

An extension of the ISO 9660 file system designed to support UNIX file system information (such as longer filenames and deeper directory structures).

Romeo

A file naming option in Easy-CD 95 and Easy-CD Pro 95 (both obsolete and replaced by Easy CD Creator) which allows you to write files to disc with names up to 128 characters long, including spaces. This was a stopgap solution to the problem that Windows NT 3.5a did not support Joliet. Romeo did not support the Unicode character set nor associated DOS (short) filenames. Romeo filenames can be read on Windows 95 and NT 3.51 systems. Romeo discs can be read on Macintosh systems if the filenames are shorter than 31 characters. For more information.

Run-In/Run-Out Blocks

Blocks of data written before and after a packet or a track, to allow the recorder to synchronize with the data on disc, and to finish up interleaved data. Four run-in blocks and two run-out blocks are written for each packet.

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S

SCSI

Small Computer System Interface (pronounced "scuzzy"). An interface which allows up to seven peripheral devices to be linked to a single controller.

Sector

The smallest recordable unit on a CD. A disc can contain [(75 sectors per second) x (60 seconds per minute) x (number of minutes on disc)] sectors. The amount of data contained in the sector depends on what physical format it is recorded in; for "regular" CD-ROM data, you can fit 2048 bytes (2 kilobytes) of data into a sector. For more information.

Sequential Erase

(Available with CD-RW discs.) Erasing the entire disc so that it can be re-used.

Session

As defined in the Orange Book, a recorded segment of a compact disc which may contain one or more tracks of any type (data or audio). In data recording, there is usually only one track per session. In audio recording, all audio tracks are contained in a single session. A lead-in and lead-out are recorded for every session on a disc.

Session-at-Once

Session-at-Once is a subset of Disc-at-Once, used for CD Extra. In Session-at-Once recording, a first session containing multiple audio tracks is recorded in a single pass, then the laser is turned off, but the disc is not closed. Then a second (data) session is written and closed.

SIF (Standard Input Format)

A format for compressed video specified by the MPEG committee, with resolutions of 352 (horizontal) x 240 (vertical) x 29.97 (fps) for NTSC and 352 (horizontal) x 288 (vertical) x 25.00 (fps) for PAL. SIF-resolution video provides an image quality similar to VHS tape.

Spindown

Many new CD-ROM drives save power by spinning down (stopping the drive's spin) when the drive is not in use. This may cause buffer underruns when recording a CD by copying tracks or files from another CD-ROM drive, if the drive "goes to sleep" and cannot be woken up quickly enough to keep up with the CD recorder's demand for a constant stream of data.

Subchannels (or subcodes)

Audio CDs have 8 subchannels of non-audio data interleaved with the audio data, called the P, Q, R, S, T, U, V, and W channels. You can think of them as small, separate streams of data running alongside the audio, which can be read by a player at the same time as the audio, if the player is "smart" enough to interpret them. For example, CD+Graphics discs (karaoke) store rudimentary graphics and text in the subchannels, but you need a special player to read and display this information.

The P and Q channels are used to tell an audio player how to play back an audio disc. The Q channel contains the index markers. In the pause (gap) before a track begins, the index marker is set to 0 (zero). When a track begins, the index marker changes to 1. (If a track contains subindexes, these are incremented by 1 sequentially during the track. In this case the Q channel might contain 1, 2, 3, 4, etc.) When the track ends, the Q channel index marker goes back to 0, then re-starts at 1 when the next track begins.

T

Table of Contents

For a whole disc or any session within a disc, shows the number of tracks, their starting locations, and the total length of the data area. The TOC does NOT show the length of each track, only its starting point.

Track

Every time you write to CD, you will create at least one track, which is preceded by a gap. Any session may contain one

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or more tracks, and the tracks within a session may be of the same or of different types (for example, a mixed-mode disc contains data and audio tracks).

Track-at-Once

A method of writing data to disc. Each time a track (data or audio) is completed, the recording laser is stopped, even if another track will be written immediately afterwards. Link and run blocks are written when the laser is turned on and off.

U

UDF

Universal Disc Format. A file system endorsed by OSTA (the Optical Storage Technology Association) for use with packet writing and other recordable optical disc technologies, such as DVD. For more information

UPC

Universal Product Code. With some CD recorders, you may define a thirteen-digit UPC catalog number for the entire disc, which will be written in the disc's Table of Contents. Also known as EAN.

V

Video CD

A standard for displaying full motion pictures with associated audio on CD. The video and sound are compressed together using the MPEG 1 standard, and recorded onto a CD Bridge disc. Video CD disc contains one data track recorded in CD-ROM XA Mode 2 Form 2. It is always the first track on the disc (Track 1). The ISO 9660 file structure and a CD-I application program are recorded in this track, as well as the Video CD Information Area which gives general information about the Video CD disc. After the data track, video is written in one or more subsequent tracks within the same session. These tracks are also recorded in Mode 2 Form 2. The session is closed after all tracks have been written.

Volume

Under the ISO 9660 standard, "volume" refers to a single CD-ROM disc. However, "volume" is often used to mean a session on a multisession disc which is not linked to other sessions.

Volume Descriptors

For an ISO 9660 disc, the Volume Descriptors are a set of optional information fields recorded at the beginning of the data area on the disc. They were originally designed for the needs of CD-ROM publishers. The full set of Volume Descriptors is as follows:

System Name: The operating system under which the application will run. This Volume Descriptor may contain a maximum of 32 a-characters, and its use is optional.

Volume Name: This is the disc name which is displayed by your operating system when the disc is mounted. It may contain a maximum of 32 a-characters, and its use is recommended.

Volume Set Name: If the CD you are preparing is part of a set of discs, every disc in the set may have an identical Volume Set Name, recorded in this field. The Volume Set Name may contain a maximum of 32 d-characters, and its use is optional.

Publisher's Name: Identifies the publisher of the disc. Maximum 128 a-characters allowed, use is optional.

Data Preparer's Name: Records the name of author of the content of the disc. Maximum 128 a-characters allowed, use optional.

Application Name: Records the name of a particular application needed to access the data on the disc, if any. Maximum 128 a-characters allowed, use optional.

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Copyright File Name: Authors can protect their work with a copyright notice stored in a file which must be placed in the root directory. The name of this file may be recorded in the Copyright File Name Volume Descriptor. Maximum: 8+3 d-characters, use optional.

Abstract File Name: This field records the name of an file stored in the root directory which describes the contents of the disc. Maximum: 8+3 d-characters, use optional.

Bibliographic File Name: This field stores the name of a file (which may be recorded in any directory) containing bibliographic information such as an ISBN number. Maximum: 8+3 d-characters, use optional.

Date Fields: There is a Volume Descriptor field for each of four dates (Creation, Modification, Expiration, Effective), in the format: year, month, day; hour, minute, second. All these fields are optional.

Y

Yellow Book

The book which sets out the standard developed by Philips and Sony for the physical format of compact discs to be used for information storage (CD-ROM).