GLOSSARY OF TERMS

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The following Glossary of Terms was designed specifically as a reference for DVD professionals. Here you will find one of the largest and most complete collections of Audio, Video and DVD-related terminology, which has been compiled over several years.

Note, if you encounter a relevant term that you do not find defined here, please let us know by e-mailing *glossary@DVDMadeEasy.com*. We would be glad to research the term for you and add it to our glossary.

Symbols & Numbers

1080i

1080 lines of interlaced video (540 lines per field). Usually refers to 1920 × 1080 resolution in 1.78 aspect ratio.

1080p

1080 lines of progressive video (1080 lines per frame). Usually refers to 1920 × 1080 resolution in 1.78 aspect ratio.

2-2 pulldown

The process of transferring 24-frame-per-second film to video by repeating each film frame as two video fields. When 24-fps film is converted via 2-2 pulldown to 25-fps 625/50 (PAL) video, the film runs 4 percent faster than normal.

2-3 pulldown

The process of converting 24-frame-per-second film to video by repeating one film frame as three fields, then the next film frame as two fields.

3-2 pulldown

An uncommon variation of 2-3 pulldown, where the first film frame is repeated for 3 fields instead of two. Most people mean 2-3 pulldown when they say 3-2 pulldown.

4:1:1

The component digital video format with one C_b sample and one C_r sample for every four Y samples. 4:1 horizontal downsampling with no vertical downsampling. Chroma is sampled on every line, but only for every four luma pixels (i.e., 1 pixel in a 1 × 4 grid). This amounts to a subsampling of chroma by a factor of two compared to luma (and by a factor of four for a single C_b or C_r component). DVD uses 4:2:0 sampling, not 4:1:1 sampling.

4:2:0

The component digital video format used by DVD, where there is one C_b sample and one C_r sample for every four Y samples (i.e., 1 pixel in a 2 × 2 grid). 2:1 horizontal downsampling and 2:1 vertical downsampling. Cb and Cr are sampled on every other line, in between the scan lines, with one set of chroma samples for each two luma samples on a line. This amounts to a subsampling of chroma by a factor of two compared to luma (and by a factor of four for a single C_b or C_r component).

4:2:2

The component digital video format commonly used for studio recordings, where there is one C_b sample and one C_r sample for every two Y samples (i.e., 1 pixel in a 1 × 2 grid). 2:1 horizontal downsampling with no vertical downsampling. This allocates the same number of samples to the chroma signal as to the luma signal. The input to MPEG-2 encoders used for DVD is typically in 4:2:2 format, but the video is subsampled to 4:2:0 before being encoded and stored.

4:4:4

A component digital video format for high-end studio recordings, where Y, C_b, and C_r are sampled equally.

480i

480 lines of interlaced video (240 lines per field). Usually refers to 720 × 480 (or 704 × 480) resolution.

480p

480 lines of progressive video (480 lines per frame). 480p60 refers to 60 frames per second; 480p30 refers to 30 frames per second; and 480p24 refers to 24 frames per second (film source). Usually refers to 720 × 480 (or 704 × 480) resolution.

4C

The four-company entity: IBM, Intel, Matsushita, Toshiba.

525/60

The scanning system of 525 lines per frame and 60 interlaced fields (30 frames) per second. Used by the NTSC television standard.

5C

The five-company entity: IBM, Intel, Matsushita, Toshiba, Sony.

625/50

The scanning system of 625 lines per frame and 50 interlaced fields (25 frames) per second. Used by PAL and SECAM television standards.

720p

720 lines of progressive video (720 lines per frame). Higher definition than standard DVD (480i or 480p). 720p60 refers to 60 frames per second; 720p30 refers to 30 frames per second; and 720p24 refers to 24 frames per second (film source). Usually refers to 1280 × 720 resolution in 1.78 aspect ratio.

8/16 modulation

The form of modulation block code used by DVD to store channel data on the disc. See modulation.

A

AAC

Advanced audio coder. An audio-encoding standard for MPEG-2 that is not backward-compatible with MPEG-1 audio.

AC

Alternating current. An electric current that regularly reverses direction. Adopted as a video term for a signal of non-zero frequency. Compare to DC.

AC-3

The former name of the Dolby Digital audio-coding system, which is still technically referred to as AC-3 in standards documents. AC-3 is the successor to Dolby's AC-1 and AC-2 audio coding techniques.

access time

The time it takes for a drive to access a data track and begin transferring data. In an optical jukebox, the time it takes to locate a specific disk, insert it in an optical drive, and begin transferring data to the host system.

ActiveMovie

The former name for Microsoft's DirectShow technology.

ADPCM

Adaptive differential pulse code modulation. A compression technique which encodes the difference between one sample and the next. Variations are lossy and lossless.

AES

Audio Engineering Society.

AES/EBU

A digital audio signal transmission standard for professional use, defined by the Audio Engineering Society and the European Broadcasting Union. S/P DIF is the consumer adaptation of this standard.

AGC

Automatic gain control. A circuit designed to boost the amplitude of a signal to provide adequate levels for recording. Also see Macrovision.

aliasing

A distortion (artifact) in the reproduction of digital audio or video that results when the signal frequency is more than twice the sampling frequency. The resolution is insufficient to distinguish between alternate reconstructions of the waveform, thus admitting additional noise that was not present in the original signal.

AMGM_VOBS

Video Object Set for Audio Manager Menu.

analog

A signal of (theoretically) infinitely variable levels. Compare to digital.

Anchor Point

One of a specified set of logical sector numbers at which descriptor, that identify an extent of a Volume Descriptor Sequence, may be recorded.

Angle Menu

Menu used to select the Angle number.

angle

An angle is a scene recorded from different viewpoints. Each angle is equal in time length and an Angle Block may contain up to nine (9) angles.

ANSI

American National Standards Institute (see http://www.ansi.org).

AOTT_AOBS

Audio Object Set for Audio Only Title.

application format

A specification for storing information in a particular way to enable a particular use.

artifact

An unnatural effect not present in the original video or audio, produced by an external agent or action. Artifacts can be caused by many factors, including digital compression, film-to-video transfer, transmission errors, data readout errors, electrical interference, analog signal noise, and analog signal crosstalk.

Most artifacts attributed to the digital compression of DVD are in fact from other sources. Digital compression artifacts will always occur in the same place and in the same way. Possible MPEG artifacts are mosquitoes, blocking, and video noise.

aspect ratio

The width-to-height ratio of an image. A 4:3 aspect ratio means the horizontal size is a third again wider than the vertical size. Standard television ratio is 4:3 (or 1.33:1). Widescreen DVD and HTDV aspect ratio is 16:9 (or 1.78:1). Common film aspect ratios are 1.85:1 and 2.35:1. Aspect ratios normalized to a height of 1 are often abbreviated by leaving off the :1.

ASV

(Audio Still Video) A still picture on a DVD-Audio disc.

ASVOBS

Audio Still Video Object Set.

ATAPI

Advanced Technology Attachment (ATA) Packet Interface. An interface between a computer and its internal peripherals such as DVD-ROM drives. ATAPI provides the command set for controlling devices connected via an IDE interface. ATAPI is part of the Enhanced IDE (E-IDE) interface, also known as ATA-2. ATAPI was extended for use in DVD-ROM drives by the SFF 8090 specification.

ATSC

Advanced Television Systems Committee. In 1978, the Federal Communications Commission (FCC) empaneled the Advisory Committee on Advanced Television Service (ACATS) as an investigatory and advisory committee to develop information that would assist the FCC in establishing an advanced broadcast television (ATV) standard for the United States. This committee created a subcommittee, the ATSC, to explore the need for and to coordinate development of the documentation of Advanced Television Systems. In 1993, the ATSC recommended that efforts be limited to a digital television system (DTV), and in September 1995 issued its recommendation for a Digital Television System standard, which was approved with the exclusion of compression format constraints (picture resolution, frame rate, and frame sequence).

ATV

Advanced television. TV with significantly better video and audio than standard TV. Sometimes used interchangeably with HDTV, but more accurately encompasses any improved television system, including those beyond HDTV. Also sometimes used interchangeably with the final recommended standard of the ATSC, which is more correctly called DTV.

AUDIO_TS

UDF file name used for audio directory on disc volume.

Audio Channel Number

These are consecutive numbers assigned to the Audio channel of the audio stream. They range from '0' to '7' in the description are of the video title set manager area. ACH0 and ACH1 are assigned to Left channel and Right channel respectively for 2 channel stereo audio signals.

Audio Menu

Menu used to select the Audio stream

Audio Stream Number

These are consecutive numbers assigned to the Audio streams for a Title in a VTS. These range from '0' to '7' in the order described in the video title set manager area. For menus the number of audio streams is limited to 0 or 1.

authoring

For DVD-Video, authoring refers to the process of designing, creating, collecting, formatting, and encoding material. For DVD-ROM, authoring usually refers to using a specialized program to produce multimedia software.

autoplay (or automatic playback)

A feature of DVD players which automatically begins playback of a disc if so encoded.

B

B picture (or B frame)

One of three picture types used in MPEG video. B pictures are bidirectionally predicted, based on both previous and following pictures. B pictures usually use the least number of bits. B pictures do not propagate coding errors since they are not used as a reference by other pictures.

bandwidth

Strictly speaking, the range of frequencies (or the difference between the highest and the lowest frequency) carried by a circuit or signal. Loosely speaking, the amount of information carried in a signal. Technically, bandwidth does not apply to digital information; the term data rate is more accurate.

BCA

Burst cutting area. A circular section near the center of a DVD disc where ID codes and manufacturing information can be inscribed in bar-code format.

Bidirectional prediction

A form of compression in which the codec uses information not only from frames that have already been decompressed, but also from frames yet to come. The codec looks in two directions: ahead as well as back. This helps avoid large spikes in data rate caused by scene changes or fast movement, improving image quality.

birefringence

An optical phenomenon where light is transmitted at slightly different speeds depending on the angle of incidence. Also light scattering due to different refractions created by impurities, defects, or stresses within the media substrate.

bit rate

The volume of data measured in bits over time. Equivalent to data rate.

bit

A binary digit. The smallest representation of digital data: zero / one, off / on, no / yes. Eight bits make one byte.

bitmap

An image made of a two-dimensional grid of pixels. Each frame of digital video can be considered a bitmap, although some color information is usually shared by more than one pixel.

bits per pixel

The number of bits used to represent the color or intensity of each pixel in a bitmap. One bit allows only two values (black and white), two bits allows four values, and so on. Also called color depth or bit depth.

bitstream recorder

A device capable of recording a stream of digital data but not necessarily able to process the data.

bitstream

Digital data, usually encoded, designed to be processed sequentially and continuously.

BLER

Block error rate. A measure of the average number of raw channel errors when reading or writing a disc.

block

In video encoding, an 8 × 8 matrix of pixels or DCT values representing a small chunk of luma or chroma. In DVD MPEG-2 video, a macroblock is made up of 6 blocks: 4 luma and 2 chroma.

blocking

A term referring to the occasional blocky appearance of compressed video (an artifact). Caused when the compression ratio is high enough that the averaging of pixels in 8 × 8 blocks becomes visible.

Blue Book

The document that specifies the CD Extra interactive music CD format (see also Enhanced CD). The original CDV specification was also in a blue book.

Book A

The document specifying the DVD physical format (DVD-ROM). Finalized in August 1996.

Book B

The document specifying the DVD-Video format. Mostly finalized in August 1996.

Book C

The document specifying the DVD-Audio format.

Book D

The document specifying the DVD record-once format (DVD-R). Finalized in August 1997.

Book E

The document specifying the rewritable DVD format (DVD-RAM). Finalized in August 1997.

bps

Bits per second. A unit of data rate.

brightness

Defined by the CIE as the attribute of a visual sensation according to which area appears to emit more or less light. Loosely, the intensity of an image or pixel, independent of color; that is, its value along the axis from black to white.

buffer

Temporary storage space in the memory of a device. Helps smooth data flow.

burst

A short segment of the color subcarrier in a composite signal, inserted to help the composite video decoder regenerate the color subcarrier.

button number

These are consecutive numbers assigned to each button on a menu, ranging from ‘1’ to ‘36’.

button

This is a rectangular area in the Sub-picture display area highlighted by the Highlight Information (HLI) that is used to define the active area on a menu associated with a specific action.

B-Y, R-Y

The general term for color-difference video signals carrying blue and red color information, where the brightness (Y) has been subtracted from the blue and red RGB signals to create B-Y and R-Y color-difference signals.

byte

A unit of data or data storage space consisting of eight bits, commonly representing a single character. Digital data storage is usually measured in bytes, kilobytes, megabytes, and so on.

C

caption

A textual representation of the audio information in a video program. Captions are usually intended for the hearing impaired, and therefore include additional text to identify the person speaking, offscreen sounds, and so on.

CAV

Constant angular velocity. Refers to rotating disc systems in which the rotation speed is kept constant, where the pickup head travels over a longer surface as it moves away from the center of the disc. The advantage of CAV is that the same amount of information is provided in one rotation of the disc. Contrast with CLV and ZCLV.

C_b, C_r

The components of digital color-difference video signals carrying blue and red color information, where the brightness (Y) has been subtracted from the blue and red RGB signals to create B-Y and R-Y color-difference signals.

CBEMA

Computer and Business Equipment Manufacturers Association.

CBR

Constant bit rate. Data compressed into a stream with a fixed data rate. The amount of compression (such as quantization) is varied to match the allocated data rate, but as a result quality may suffer during high compression periods. In other words, data rate is held constant while quality is allowed to vary. Compare to VBR.

CCI

Copy control information. Information specifying if content is allowed to be copied.

CCIR Rec. 601

A standard for digital video. The CCIR changed its name to ITU-R, and the standard is now properly called ITU-R BT.601.

CD

Short for compact disc, an optical disc storage format developed by Philips and Sony.

CD+G

Compact disc plus graphics. A variation of CD which embeds graphical data in with the audio data, allowing video pictures to be displayed periodically as music is played. Primarily used for karaoke.

CD-DA

Compact disc digital audio. The original music CD format, storing audio information as digital PCM data. Defined by the Red Book standard.

CD-i

Compact disc interactive. An extension of the CD format designed around a set-top computer that connects to a TV to provide interactive home entertainment, including digital audio and video, video games, and software applications. Defined by the Green Book standard.

CD-Plus

A type of Enhanced CD format using stamped multisession technology.

CD-R

An extension of the CD format allowing data to be recorded once on a disc by using dye-sublimation technology. Defined by the Orange Book standard.

CD-ROM XA

CD-ROM extended architecture. A hybrid version of CD allowing interleaved audio and video.

CD-ROM

Compact disc read-only memory. An extension of the Compact disc digital audio (CD-DA) format that allows computer data to be stored in digital format. Defined by the Yellow Book standard.

CDV

A combination of laserdisc and CD which places a section of CD-format audio on the beginning of the disc and a section of laserdisc-format video on the remainder of the disc.

cell command

A Navigation command executed when the presentation of a cell has been completed.

Cell

In DVD-Video, a unit of video anywhere from a fraction of a second to hours long. Cells allow the video to be grouped for sharing content among titles, interleaving for multiple angles, and so on.

CEMA

Consumer Electronics Manufacturers Association. A subsidiary of the Electronics Industry Association (EIA).

CGMS

Copy Guard Management System. A method of preventing copies or controlling the number of sequential copies allowed. CGMS / A is added to an analog signal (such as line 21 of NTSC). CGMS / D is added to a digital signal, such as IEEE 1394.

challenge key

Data used in the authentication key exchange process between a DVD-ROM drive and a host computer, where one side determines if the other side contains the necessary authorized keys and algorithms for passing encrypted (scrambled) data.

channel bit

The bits stored on the disc, after being modulated.

channel data

The bits physically recorded on an optical disc after error-correction encoding and modulation. Because of the extra information and processing, channel data is larger than the user data contained within it.

channel

A part of an audio track. Typically there is one channel allocated for each loudspeaker.

chapter

In DVD-Video, a division of a title. Technically called a part of title (PTT).

chroma (C')

The nonlinear color component of a video signal, independent of the luma. Identified by the symbol C' (where ' indicates nonlinearity) but usually written as C because it's never linear in practice.

chroma subsampling

Reducing color resolution by taking fewer color samples than luminance samples.

chrominance (C)

The color component (hue and saturation) of light, independent of luminance. Technically, chrominance refers to the linear component of video, as opposed to the transformed nonlinear chroma component.

CIE

Commission Internationale de l'Éclairage / International Commission on Illumination.

CIF

Common intermediate format. Video resolution of 352 × 288.

CIRC

Cross-interleaved Reed Solomon code. An error-correction coding method which overlaps small frames of data.

clamping area

The area near the inner hole of a disc where the drive grips the disc in order to spin it.

closed caption

Textual video overlays that are not normally visible, as opposed to open captions, which are a permanent part of the picture. Captions are usually a textual representation of the spoken audio. In the United States, the official NTSC Closed Caption standard requires that all TVs larger than 13 inches include circuitry to decode and display caption information stored on line 21 of the video signal. DVD-Video can provide closed caption data, but the subpicture format is preferred for its versatility.

CLUT

Color lookup table. An index that maps a limited range color values to a full range of values such as RGB or YUV.

CLV

Constant linear velocity. Refers to a rotating disc system in which the head moves over the disc surface at a constant velocity, requiring that the motor vary the rotation speed as the head travels in and out. The further the head is from the center of the disc, the slower the rotation. The advantage of CLV is that data density remains constant, optimizing use of the surface area. Contrast with CAV and ZCLV.

CMI

Content management information. General information about copy protection and allowed use of protected content. Includes CCI.

codec

Coder / decoder. Circuitry or computer software that encodes and decodes a signal.

color depth

The number of levels of color (usually including luma and chroma) that can be represented by a pixel. Generally expressed as a number of bits or a number of colors. The color depth of MPEG video in DVD is 24 bits, although the chroma component is shared across 4 pixels (averaging 12 actual bits per pixel).

color difference

A pair of video signals that contain the color components minus the brightness component, usually B-Y and R-Y (G-Y is not used, since it generally carries less information). The color-difference signals for a black-and-white picture are zero. The advantage of color-difference signals is that the color component can be reduced more than the brightness (luma) component without being visually perceptible.

Color model

Any of several means of specifying colors according to their individual components. See RGB, YUV.

colorburst

See burst.

colorist

The title used for someone who operates a telecine machine to transfer film to video. Part of the process involves correcting the video color to match the film.

combo drive

A DVD-ROM drive capable of reading and writing CD-R and CD-RW media. May also refer to a DVD-R or DVD-RW or DVD+RW drive with the same capability.

component video

A video system containing three separate color component signals, either red / green / blue (RGB) or chroma / color difference (YC_bC_r, YP_bP_r, YUV), in analog or digital form. The MPEG-2 encoding system used by DVD is based on color-difference component digital video. Very few televisions have component video inputs.

composite video

An analog video signal in which the luma and chroma components are combined (by frequency multiplexing), along with sync and burst. Also called CVBS. Most televisions and VCRs have composite video connectors, which are usually colored yellow.

compression

The process of removing redundancies in digital data to reduce the amount that must be stored or transmitted. Lossless compression removes only enough redundancy so that the original data can be recreated exactly as it was. Lossy compression sacrifices additional data to achieve greater compression.

constant data rate or constant bit rate

See CBR.

Content Scrambling System (CSS)

In DVD-Video, an encryption scheme designed to protect copyrighted material that resides on a disc by periodically scrambling the data using encryption keys.

contrast

The range of brightness between the darkest and lightest elements of an image.

control area

A part of the lead-in area on a DVD containing one ECC block (16 sectors) repeated 192 times. The repeated ECC block holds information about the disc.

CP_SEC

Copyright Protection System flag. In DVD-Video, a 1-bit value stored in the CPR_MAI that indicates if the corresponding sector has implemented a copyright protection system. See Content Scrambling System (CSS).

CPM

Copyrighted Material flag. In DVD-Video, a 1-bit value stored in the CPR_MAI that indicates if the corresponding sector includes any copyrighted material.

CPPM

Content Protection for Prerecorded Media. Copy protection for DVD-Audio.

CPR_MAI

Copyright Management Information. In DVD-Video, an extra 6 bytes per sector that includes the Copyright Protection System Type (CPS_TY) and Region Management information (RMA) in the Contents provider section of the Control data block; and Copyrighted Material flag (CPM), Copyright Protection System flag (CP_SEC) and Copy Guard Management System (CGMS) flags in the Data Area.

CPRM

Content Protection for Recordable Media. Copy protection for writable DVD formats.

CPS_TY

Copyright Protection System Type. In DVD-Video, an 8-bit (1 byte) value stored in the CPR_MAI that defines the type of copyright protection system implemented on a disc.

CPSA

Content Protection System Architecture. An overall copy protection design for DVD.

CPTWG

Copy Protection Technical Working Group. The industry body responsible for developing or approving DVD copy protection systems.

CPU

Central processing unit. The integrated circuit chip that forms the brain of a computer or other electronic device. DVD-Video players contain rudimentary CPUs to provide general control and interactive features.

crop

To trim and remove a section of the video picture in order to make it conform to a different shape. Cropping is used in the pan & scan process, but not in the letterbox process.

CSS

See Content Scrambling System.

CVBS

Composite video baseband signal. Standard single-wire video, mixing luma and chroma signals together.

Cyclic Redundancy Check (CRC)

A method for computing a signature of a sequence of bytes used to detect the presence of errors in the data.

D

DAC

Digital-to-analog converter. Circuitry that converts digital data (such as audio or video) to analog data.

DAE

Digital audio extraction. Reading digital audio data directly from a CD audio disc.

DAT

Digital audio tape. A magnetic audio tape format that uses PCM to store digitized audio or digital data.

data area

The physical area of a DVD disc between the lead in and the lead out (or middle area) which contains the stored data content of the disc.

data rate

The volume of data measured over time; the rate at which digital information can be conveyed. Usually expressed as bits per second with notations of kbps (thousand / sec), Mbps (million / sec), and Gbps (billion / sec). Digital audio date rate is generally computed as the number of samples per second times the bit size of the sample. For example, the data rate of uncompressed 16-bit, 48-kHz, two-channel audio is 1536 kbps. Digital video bit rate is generally computed as the number of bits per pixel times the number of pixels per line times the number of lines per frame times the number of frames per second. For example, the data rate of a DVD movie before compression is usually 12 × 720 × 480 × 24 = 99.5 Mbps. Compression reduces the data rate. Digital data rate is sometimes inaccurately equated with bandwidth.

Data Search Information (DSI)

Information for Fast Forward / Fast Backward and seamless playback. This is real time control data spread throughout the DVD-Video data stream. Along with PGCI, these packets are part of the 1.00 mbit / sec overhead in video applications (Book B). These packets contain navigation information which makes it possible to search and maintain seamless playback of the Video Object Unit (VOBU). The most important field in this packet is the sector address where the first reference frame of the video object begins. Advanced angle change and presentation timing are included to assist seamless playback.

dB

See decibel.

DBS

Digital broadcast satellite. The general term for 18-inch digital satellite systems.

DC

Direct current. Electrical current flowing in one direction only. Adopted in the video world to refer to a signal with zero frequency. Compare to AC.

DCC

Digital compact cassette. A digital audio tape format based on the popular compact cassette. Abandoned by Philips in 1996.

DCT

Discrete cosine transform. An invertible, discrete, orthogonal transformation. Got that? A mathematical process used in MPEG video encoding to transform blocks of pixel values into blocks of spatial frequency values with lower-frequency components organized into the upper-left corner, allowing the high-frequency components in the lower-right corner to be discounted or discarded. Also digital component technology, a videotape format.

DDWG

Digital Display Working Group (see DVI).

decibel (dB)

A unit of measurement expressing ratios using logarithmic scales related to human aural or visual perception. Many different measurements are based on a reference point of 0 dB; for example a standard level of sound or power.

decimation

A form of subsampling which discards existing samples (pixels, in the case of spatial decimation, or pictures, in the case of temporal decimation). The resulting information is reduced in size but may suffer from aliasing.

decode

To reverse the transformation process of an encoding method. Decoding processes are usually deterministic.

decoder

1) A circuit that decodes compressed audio or video, taking an encoded input stream and producing output such as audio or video. DVD players use the decoders to recreate information that was compressed by systems such as MPEG-2 and Dolby Digital; 2) a circuit that converts composite video to component video or matrixed audio to multiple channels.

delta picture (or delta frame)

A video picture based on the changes from the picture before (or after) it. MPEG P pictures and B pictures are examples. Contrast with key picture.

deterministic

A process or model whose outcome does not depend upon chance, and where a given input will always produce the same output. Audio and video decoding processes are mostly deterministic.

digital signal processor (DSP)

A digital circuit that can be programmed to perform digital data manipulation tasks such as decoding or audio effects.

Digital Versatile Disc (DVD)

Generic name for a family of related disc formats encompassing Video, Audio, and computer file storage on an optical disc format. They share common physical format and logical / file structures. They differ only content. Physical differences between erasable (Book E), write-once read many times (Book D), and ROM (Book A) may emerge.

digital video noise reduction (DVNR)

Digitally removing noise from video by comparing frames in sequence to spot temporal aberrations.

digital

Expressed in digits. A set of discrete numeric values, as used by a computer. Analog information can be digitized by sampling.

Digital Visual Interface (DVI)

The digital video interface standard developed by the Digital Display Working Group (DDWG). A replacement for analog VGA monitor interface.

digitize

To convert analog information to digital information by sampling.

DIN

Deutsches Institut für Normung / German Institute for Standardization.

directory

The part of a disc that indicates what files are stored on the disc and where they are located.

Directory structure

For the video specification (Book B), this defines a common set of files that must be present on all DVD discs. Components include Root and VIDEO_TS.

DirectShow

A software standard developed by Microsoft for playback of digital video and audio in the Windows operating system. Replaces the older MCI and Video for Windows software.

disc key

A value used to encrypt and decrypt (scramble) a title key on DVD-Video discs.

disc menu

The main menu of a DVD-Video disc, from which titles are selected. Also called the system menu or title selection menu. Sometimes confusingly called the title menu, which more accurately refers to the menu within a title from which audio, subpicture, chapters, and so forth can be selected.

discrete cosine transform (DCT)

An invertible, discrete, orthogonal transformation. A mathematical process used in MPEG video encoding to transform blocks of pixel values into blocks of spatial frequency values with lower-frequency components organized into the upper-left corner, allowing the high-frequency components in the lower-right corner to be discounted or discarded.

discrete surround sound

Audio in which each channel is stored and transmitted separate from and independent of other channels. Multiple independent channels directed to loudspeakers in front of and behind the listener allow precise control of the soundfield in order to generate localized sounds and simulate moving sound sources.

display rate

The number of times per second the image in a video system is refreshed. Progressive scan systems such as film or HDTV change the image once per frame. Interlace scan systems such as standard television change the image twice per frame, with two fields in each frame. Film has a frame rate of 24 fps, but each frame is shown twice by the projector for a display rate of 48 fps. 525/60 (NTSC) television has a rate of 29.97 frames per second (59.94 fields per second). 625/50 (PAL/SECAM) television has a rate of 25 frames per second (50 fields per second).

Divx

Digital Video Express. A short-lived pay-per-viewing-period variation of DVD.

DLT

Digital linear tape. A digital archive standard using half-inch tapes, commonly used for submitting a premastered DVD disc image to a replication service.

Dolby Digital

A perceptual coding system for audio, developed by Dolby Laboratories and accepted as an international standard. Dolby Digital is the most common means of encoding audio for DVD-Video and is the mandatory audio compression system for 525/60 (NTSC) discs.

Dolby Pro Logic

The technique (or the circuit which applies the technique) of extracting surround audio channels from a matrix-encoded audio signal. Dolby Pro Logic is a decoding technique only, but is often mistakenly used to refer to Dolby Surround audio encoding.

Dolby Surround

The standard for matrix encoding surround-sound channels in a stereo signal by applying a set of defined mathematical functions when combining center and surround channels with left and right channels. The center and surround channels can then be extracted by a decoder such as a Dolby Pro Logic circuit which applies the inverse of the mathematical functions. A Dolby Surround decoder extracts surround channels, while a Dolby Pro Logic decoder uses additional processing to create a center channel. The process is essentially independent of the recording or transmission format. Both Dolby Digital and MPEG audio compression systems are compatible with Dolby Surround audio.

domain

Program Chains (PGC) are classified into four types of domains, including First Play Domain, Video Manager Menu Domain, VTS Menu Domain and Title Domain.

downmix

To convert a multichannel audio track into a two-channel stereo track by combining the channels with the Dolby Surround process. All DVD players are required to provide downmixed audio output from Dolby Digital audio tracks.

downsampling

See subsampling.

DRC

See dynamic range compression.

driver

A software component that enables an application to communicate with a hardware device.

DSD

Direct Stream Digital. An uncompressed audio bitstream coding method developed by Sony. An alternative to PCM.

DSI

See Data Search Information (DSI).

DSP

Digital signal processor (or processing).

DSVCD

Double Super Video Compact. Long-playing (100-minute) variation of SVCD.

DTS

Digital Theater Sound. A perceptual audio-coding system developed for theaters. A competitor to Dolby Digital and an optional audio track format for DVD-Video and DVD-Audio.

DTS-ES

A version of DTS decoding that is compatible with 6.1-channel Dolby Surround EX. DTS-ES Discrete is a variation of DTS encoding and decoding that carries a discrete rear center channel instead of a matrixed channel.

DTV

Digital television. In general, any system that encodes video and audio in digital form. In specific, the Digital Television System proposed by the ATSC or the digital TV standard proposed by the Digital TV Team founded by Microsoft, Intel, and Compaq.

duplication

The reproduction of media. Generally refers to producing discs in small quantities, as opposed to large-scale replication.

DV

Digital Video. Usually refers to the digital videocassette standard developed by Sony and JVC.

DVB

Digital video broadcast. A European standard for broadcast, cable, and digital satellite video transmission.

DVC

Digital video cassette. Early name for DV.

DVCAM

Sony's proprietary version of DV.

DVCD

Double Video Compact Disc. Long-playing (100-minute) variation of VCD.

DVCPro

Matsushita's proprietary version of DV.

DVDA

DVD Association, a non-profit industry trade association representing DVD authors, producers, and vendors throughout the world.

DVD-Audio (DVD-A)

The audio-only format of DVD. Primarily uses PCM audio with MLP encoding, along with an optional subset of DVD-Video features.

DVD Forum

An international association of hardware and media manufacturers, software firms and other users of Digital Versatile Discs, created for the purpose of exchanging and disseminating ideas and information about the DVD Format.

DVD Multi

DVD Multi is a logo program that promotes compatibility with DVD-RAM and DVD-RW. It is not a drive, but defines a testing methodology which, when passed, ensures the drive product can in fact read RAM and -RW. It puts the emphasis for compatibility on the reader, not the writer.

DVD-R (DVD Recordable)

The authoring use drive (635nm laser) was introduced in 1998 by Pioneer, and the general use format (650nm laser) was authorized by DVD Forum in 2000. DVD-R offers a write-once, read-many storage format akin to CD-R and is used to master DVD-Video and DVD-ROM discs, as well as for data archival and storage applications.

DVD-RW (DVD ReWritable)

A rewritable DVD format, introduced by Pioneer, that is similar to DVD+RW. It has a read-write capacity of 4.38 GB.

DVD-RAM (DVD Random Access Memory)

A rewritable DVD disc endorsed by Panasonic, Hitachi and Toshiba. It is a cartridge-based, and more recently, bare disc technology for data recording and playback. The first DVD-RAM drives were introduced in Spring 1998 and had a capacity of 2.6GB (single sided) or 5.2GB (double sided). DVD-RAM Version 2 discs with 4.38GB arrived in late 1999, and double-sided 9.4GB discs in 2000. DVD-RAM drives typically read DVD-Video, DVD-ROM and CD media. The current installed base of DVD-ROM drives and DVD-Video players cannot read DVD-RAM media.

DVD-ROM

The base format of DVD. ROM stands for read-only memory, referring to the fact that standard DVD-ROM and DVD-Video discs can't be recorded on. A DVD-ROM can store essentially any form of digital data.

DVD+RW (DVD ReWritable)

Developed in cooperation by Hewlett-Packard, Mitsubishi Chemical, Philips, Ricoh, Sony and Yamaha, it is a rewritable format that provides full, non-cartridge, compatibility with existing DVD-Video players and DVD-ROM drives for both real-time video recording and random data recording across PC and entertainment applications.

DVD-Video (DVD-V)

A standard for storing and reproducing audio and video on DVD-ROM discs, based on MPEG video, Dolby Digital and MPEG audio, and other proprietary data formats.

DVI

See Digital Visual Interface.

DVNR

See digital video noise reduction.

DVS

Descriptive video services. Descriptive narration of video for blind or sight-impaired viewers.

dye polymer

The chemical used in DVD-R and CD-R media that darkens when heated by a high-power laser.

dye-sublimation

Optical disc recording technology that uses a high-powered laser to burn readable marks into a layer of organic dye. Other recording formats include magneto-optical and phase-change.

dynamic range compression

A technique of reducing the range between loud and soft sounds in order to make dialogue more audible, especially when listening at low volume levels. Used in the downmix process of multichannel Dolby Digital sound tracks.

dynamic range

The difference between the loudest and softest sound in an audio signal. The dynamic range of digital audio is determined by the sample size. Increasing the sample size does not allow louder sounds; it increases the resolution of the signal, thus allowing softer sounds to be separated from the noise floor (and allowing more amplification with less distortion). Dynamic range refers to the difference between the maximum level of distortion-free signal and the minimum limit reproducible by the equipment.

E

EBU

European Broadcasting Union.

ECC

See Error correction code.

ECC Constraint Length

The number of sectors that are interleaved to combat bursty error characteristics of discs. 16 sectors are interleaved in DVD. Interleaving takes advantage of typical disc defects such as scratch marks by spreading the error over a larger data area, thereby increasing the chance that the error correction codes can conceal the error.

ECD

Error-detection and correction code. See error-correction code.

ECMA

European Computer Manufacturers Association (see http://www.ecma.org).

ECMA-262

An ECMA standard that specifies the core JavaScript language, which is expected to be adopted shortly by the International Standards Organization (ISO) as ISO 16262. ECMA-262 is roughly equivalent to JavaScript 1.1.

EDC

See Error Detection Code.

edge enhancement

When films are transferred to video in preparation for DVD encoding, they are commonly run through digital processes that attempt to clean up the picture. These processes include noise reduction (DVNR) and image enhancement.

Enhancement increases contrast (similar to the effect of the “sharpen” or “unsharp mask” filters in PhotoShop), but can tend to overdo areas of transition between light and dark or different colors, causing a “chiseled” look or a ringing effect like the haloes you see around street lights when driving in the rain. Video noise reduction is a good thing, when done well, since it can remove scratches, spots, and other defects from the original film. Enhancement, which is rarely done well, is a bad thing. The video may look sharper and clearer to the casual observer, but fine tonal details of the original picture are altered and lost.

EDS

Enhanced data services. Additional information in NTSC line such as a time signal.

EDTV

Enhanced-definition television. A system which uses existing transmission equipment to send an enhanced signal which looks the same on existing receivers but carries additional information to improve the picture quality on new enhanced receivers. PALPlus is an example of EDTV. (Contrast with HDTV and IDTV.)

EFM

Eight-to-fourteen modulation. This low-level and very critical channel coding technique maximizes pit sizes on the disc by reducing frequent transitions from 0 to 1 or 1 to 0. CD employs pulse width modulation, representing 1's as Land-pit transitions along the track. The 8/14 code maps 8 user data bits into 14 channel bits. In the 1982 compact disc standard (IEC 908 standard), 3 merge bits are added to the 14 bit block to further eliminate 1-0 or 0-1 transitions between adjacent 8/14 blocks.

EFM Plus

DVD's EFM+ method is a derivative of EFM. It folds the merge bits into the main 8/16 table. EFM+ may be covered by U.S. Patent 5,206,646.

EIA

Electronics Industry Association.

E-IDE

Enhanced Integrated Drive Electronics. Extensions to the IDE standard providing faster data transfer and allowing access to larger drives, including CD-ROM and tape drives, using ATAPI. E-IDE was adopted as a standard by ANSI in 1994. ANSI calls it Advanced Technology Attachment-2 (ATA-2) or Fast ATA.

elementary stream

A general term for a coded bitstream such as audio or video. Elementary streams are made up of packs of packets.

emulate

To test the function of a DVD disc on a computer after formatting a complete disc image.

encode

To transform data for storage or transmission, usually in such a way that redundancies are eliminated or complexity is reduced. Most compression is based on one or more encoding methods. Data such as audio or video is encoded for efficient storage or transmission and is decoded for access or display.

encoder

1) A circuit or program that encodes (and thereby compresses) audio or video; 2) a circuit that converts component digital video to composite analog video. DVD players include TV encoders to generate standard television signals from decoded video and audio; 3) a circuit that converts multichannel audio to two-channel matrixed audio.

Enhanced CD

A general term for various techniques that add computer software to a music CD, producing a disc which can be played in a music player or read by a computer. Also called CD Extra, CD Plus, hybrid CD, interactive music CD, mixed-mode CD, pre-gap CD, or track-zero CD.

entropy coding

Variable-length, lossless coding of a digital signal to reduce redundancy. MPEG-2, DTS and Dolby Digital apply entropy coding after the quantization step. MLP also uses entropy coding.

EQ

Equalization of audio.

error-correction code

Additional information added to data to allow errors to be detected and possibly corrected.

Error Detection Code (EDC)

A 32-bit (4 byte) CRC-like code appended at the end of a DVD data sector.

ETSI

European Telecommunications Standards Institute.

Extent

(1) For the volume structure and the ISO 9660 file structure, an extent is defined as a set of logical sectors, the logical sector numbers of which form a continuous ascending sequence. The address, or location, of an extent is the number of the first logical sector in the sequence. (2) For the UDF file structure an extent is defined as a set of logical blocks, the logical block numbers of which form a continuous ascending sequence. The address, or location, of an extent is the number of the first logical block in the sequence.

F

father

The metal master disc formed by electroplating the glass master. The father disc is used to make *mother* discs, from which multiple stampers (*sons*) can be made.

field

A set of alternating scan lines in an interlaced video picture. A frame is made of a top (odd) field and a bottom (even) field.

file set

A collection of files and directories.

file system

A defined way of storing files, directories, and information about them on a data storage device.

file

A collection of data stored on a disc, usually in groups of sectors.

filter

(verb) To reduce the amount of information in a signal. (noun) A circuit or process that reduces the amount of information in a signal. Analog filtering usually removes certain frequencies. Digital filtering (when not emulating analog filtering) usually averages together multiple adjacent pixels, lines, or frames to create a single new pixel, line, or frame. This generally causes a loss of detail, especially with complex images or rapid motion. See letterbox filter. Compare to interpolate.

FireWire

A standard for transmission of digital data between external peripherals, including consumer audio and video devices. The official name is IEEE 1394, based on the original FireWire design by Apple Computer.

First Play PGC

This Program Chain (PGC) is described in the Video Manager Information table, and has no corresponding video objects (VOB). The First Play PGC is executed at initial access, e.g. just after disc loading.

fixed rate

Information flow at a constant volume over time. See CBR.

forced activation button

Menu buttons that automatically perform the specified action as soon as the button has been highlighted on the menu.

forced selected button

Menu button that is automatically selected when the menu is displayed.

forced display

A feature of DVD-Video allowing subpictures to be displayed even if the player's subpicture display mode is turned off. Designed for showing subtitles in a scene where the language is different from the native language of the film.

formatting

1) Creating a disc image. 2) Preparing storage media for recording.

fps

Frames per second. A measure of the rate at which pictures are shown for a motion video image. In NTSC and PAL video, each frame is made up of two interlaced fields.

fragile watermark

A watermark designed to be destroyed by any form of copying or encoding other than a bit-for-bit digital copy. Absence of the watermark indicates that a copy has been made.

frame doubler

A video processor that increases the frame rate (display rate) in order to create a smoother-looking video display. Compare to line doubler.

frame rate

The frequency of discrete images. Usually measured in frames per second (fps). Film has a rate of 24 frames per second, but usually must be adjusted to match the display rate of a video system.

frame

The piece of a video signal containing the spatial detail of one complete image; the entire set of scan lines. In an interlaced system, a frame contains two fields.

frequency

The number of repetitions of a phenomenon in a given amount of time. The number of complete cycles of a periodic process occurring per unit time.

Full motion video

Video that plays at thirty frames per second (NTSC) or 25 frames per second (PAL).

G

G

Giga. An SI prefix for denominations of 1 billion (10^9).

G byte

One billion (10^9) bytes. Not to be confused with GB or gigabyte (2^{30} bytes).

Galaxy Group

The group of companies proposing the Galaxy watermarking format. (IBM / NEC, Hitachi / Pioneer / Sony.)

GB

Gigabyte.

Gbps

Gigabits / second. Billions (10^9) of bits per second.

General Parameters (GPRMs)

GPRMs are used to store the users operational history and to modify a players behavior. DVD-Video players have 16 unique GPRMs. Each GRPM may store a fixed length, two-byte numerical value.

gigabyte

1,073,741,824 (2^{30}) bytes.

Group of Audio Frames (GOF)

Group of Audio Frames. The data area of 1/30 second which is composed of 20 audio frames of Linear PCM Audio.

Group of Pictures (GOP)

Group of pictures. In MPEG video, one or more I pictures followed by P and B pictures. A GOP is the atomic unit of MPEG video access. GOPs are limited in DVD-Video to 18 frames for 525/60 and 15 frames for 625/50.

gray market

Dealers and distributors who sell equipment without proper authorization from the manufacturer.

Green Book

The document developed in 1987 by Philips and Sony as an extension to CD-ROM XA for the CD-i system.

H

H/DTV

High-definition/digital television. A combination of acronyms that refers to both HDTV and DTV systems.

Half D1

An MPEG-2 video encoding mode in which half the horizontal resolution is sampled (352 × 480 for NTSC, 352 × 576 for PAL).

HAVi

A consumer electronics industry standard for interoperability between digital audio and video devices connected via a network in the consumer's home.

HDCD

High-definition Compatible Digital. A proprietary method of enhancing audio on CDs.

HDTV

High-definition television. A video format with a resolution approximately twice that of conventional television in both the horizontal and vertical dimensions, and a picture aspect ratio of 16:9. Used loosely to refer to the U.S. DTV System. Contrast with EDTV and IDTV.

Hertz

See Hz.

hexadecimal

Representation of numbers using base 16.

HFS

Hierarchical file system. A file system used by Apple Computer's Mac OS operating system.

Highlight Information (HLI)

This is used to specify button highlights for menus. HLI contains information on the button number, highlight timing, palette for sub-picture highlights, coordinates of the button, etc.

High Sierra

The original file system standard developed for CD-ROM, later modified and adopted as ISO 9660.

horizontal resolution

See lines of horizontal resolution.

HQ-VCD

High-quality Video Compact Disc. Developed by the Video CD Consortium (Philips, Sony, Matsushita and JVC) as a successor to VCD. Evolved into SVCD.

HRRA

Home Recording Rights Association.

HSF

See High Sierra.

HTML

Hypertext markup language. A tagging specification, based on SGML (standard generalized markup language), for formatting text to be transmitted over the Internet and displayed by client software.

hue

The color of light or of a pixel. The property of color determined by the dominant wavelength of light.

Huffman coding

A lossless compression technique of assigning variable-length codes to a known set of values. Values occurring most frequently are assigned the shortest codes. MPEG uses a variation of Huffman coding with fixed code tables, often called variable-length coding (VLC).

Hz

Hertz. A unit of frequency measurement. The number of cycles (repetitions) per second.

I

I picture (or I frame)

In MPEG video, an intra picture that is encoded independent from other pictures (see intraframe). Transform coding (DCT, quantization, and VLC) is used with no motion compensation, resulting in only moderate compression. I pictures provide a reference point for dependent P pictures and B pictures and allow random access into the compressed video stream.

i.Link

Trademarked Sony name for IEEE 1394.

ID Error Correction (IEC)

2 special error correction bytes (IEC) that are added to each sector header.

IDE

Integrated Drive Electronics. An internal bus, or standard electronic interface between a computer and internal block storage devices. IDE was adopted as a standard by ANSI in November 1990. ANSI calls it Advanced Technology Attachment (ATA). Also see E-IDE and ATAPI.

Identification Data (ID)

32-bit field identifying the sector number within the disc volume.

IDTV

Improved-definition television. A television receiver that improves the apparent quality of the picture from a standard video signal by using techniques such as frame doubling, line doubling, and digital signal processing.

IEC

International Electrotechnical Commission.

IED

ID error correction. An error-detection code applied to each sector ID on a DVD disc.

IEEE 1394

A standard for transmission of digital data between external peripherals, including consumer audio and video devices. Also known as FireWire or i.Link.

IEEE

Institute of Electrical and Electronics Engineers. An electronics standards body.

IFE

In-flight entertainment.

I-MPEG

Intraframe MPEG. An unofficial variation of MPEG video encoding that uses only intraframe compression. I-MPEG is used by DV equipment.

interframe

Something that occurs between multiple frames of video. Interframe compression takes temporal redundancy into account. Contrast with intraframe.

interlace

A video scanning system in which alternating lines are transmitted, so that half a picture is displayed each time the scanning beam moves down the screen. An interlaced frame is made of two fields.

interleave

To arrange data in alternating chunks so that selected parts can be extracted while other parts are skipped over, or so that each chunk carries a piece of a different data stream. In DVD, used for seamless multi-angle and Director's cut features, in which multiplexed streams are subsequently interleaved to allow seamless playback of alternate program material.

interpolate

To increase the pixels, scan lines, or pictures when scaling an image or a video stream by averaging together adjacent pixels, lines, or frames to create additional inserted pixels or frames. This generally causes a softening of still images and a blurriness of motion images because no new information is created. Compare to filter.

intraframe

Something that occurs within a single frame of video. Intraframe compression does not reduce temporal redundancy, but allows each frame to be independently manipulated or accessed. (See I picture.) Compare to interframe.

inverse telecine

The reverse of 3:2 pulldown, where the frames which were duplicated to create 60-fields / second video from 24-frames / second film source are removed. MPEG-2 video encoders usually apply an inverse telecine process to convert 60-fields / second video into 24-frames / second encoded video. The encoder adds information enabling the decoder to recreate the 60-fields / second display rate.

ISO

International Organization for Standardization (see http: / / www.iso.ch).

ISO 2202

Information Processing – ISO 7-bit and 8-bit coded character sets – Code extension techniques

ISO 3166

Codes for the representation of names of countries.

ISO 3901

Documentation – International Standard Recording Code (ISRC).

ISO 639

Codes for the representation of names of languages.

ISO 8859-1

Information Processing – 8-bit single-byte coded graphic character sets.

ISO 9660

The international standard for the file system used by CD-ROM. Allows file names of only 8 characters plus a 3-character extension.

ISO/IEC 11172

Information technology coding of moving pictures and associated audio for digital storage media up to about 1.5 Mbit / s. (MPEG-1)

ISO/IEC 13818

Information technology- generic coding of moving pictures and associated audio. (MPEG-2)

ISO/IEC DIS 13818-3

Information technology- generic coding of moving pictures and associated audio.

ISRC

International Standard Recording Code.

ITU

International Telecommunication Union.

ITU-R BT.601

The international standard specifying the format of digital component video. Currently at version 5 (identified as 601-5).

J

Java

A highly portable, object-oriented programming language developed by Sun Microsystems. Not to be confused with JavaScript (below).

JavaScript

A programming language originally created by Netscape with specific features designed for use with the Internet and HTML, and syntax resembling that of Java and C++. Now standardized as ECMA-262.

JCIC

Joint Committee on Intersociety Coordination.

JEC

Joint Engineering Committee of EIA and NCTA.

jewel box

The plastic clamshell case that holds a CD or DVD.

jitter

Temporal variation in a signal from an ideal reference clock. There are many kinds of jitter, including sample jitter, channel jitter, and interface jitter.

JPEG

Joint Photographic Experts Group. The international committee which created its namesake standard for compressing still images.

JScript

A proprietary Microsoft variant of JavaScript (above).

K

k

Kilo. An SI prefix for denominations of one thousand (10^3). Also used, in capital form, for 1024 bytes of computer data (see kilobyte).

k byte

One thousand (10^3) bytes. Not to be confused with KB or kilobyte (2^{10} bytes). Note the small "k."

karaoke

Literally, empty orchestra. The social sensation from Japan where sufficiently inebriated people embarrass themselves in public by singing along to a music track. Karaoke was largely responsible for the success of laserdisc in Japan, thus supporting it elsewhere.

KB

Kilobyte.

kbps

Kilobits / second. Thousands (10^3) of bits per second.

key picture (or key frame)

A video picture containing the entire content of the image (intraframe encoding), rather than the difference between it and another image (interframe encoding). MPEG I pictures are key pictures. Contrast with delta picture.

kHz

Kilohertz. A unit of frequency measurement. One thousand cycles (repetitions) per second or 1000 hertz.

kilobyte

1024 (2^{10}) bytes.

L

land

The raised area of an optical disc.

laserdisc

A 12-inch (or 8-inch) optical disc that holds analog video (using an FM signal) and both analog and digital (PCM) audio. A precursor to DVD.

layer

The plane of a DVD disc on which information is recorded in a pattern of microscopic pits. Each substrate of a disc can contain one or two layers.

Layer 0

In a dual-layer disc, this is the layer closest to the optical pickup beam and surface of the disc, and the first to be read when scanning from the beginning of the disc's data. Dual-layer discs are 10% less dense than single layer discs due to crosstalk between the layers.

Layer 1

In a dual-layer disc, this is the deeper of the two layers, and the second one to be read when scanning from the beginning of the disc's data.

lead in

The physical area 1.2 mm or wider preceding the data area on a disc. The lead in contains sync sectors and control data including disc keys and other information.

lead out

On a single-layer disc or PTP dual-layer disc, the physical area 1.0 mm or wider toward the outside of the disc following the data area. On an OTP dual-layer disc, the physical area 1.2 mm or wider at the inside of the disc following the recorded data area (which is read from the outside toward the inside on the second layer).

legacy

A term used to describe a hybrid disc that can be played in both a DVD player and a CD player.

letterbox filter

Circuitry in a DVD player that reduces the vertical size of anamorphic widescreen video (combining every 4 lines into 3) and adds black mattes at the top and bottom. Also see filter.

letterbox

The process or form of video where black horizontal mattes are added to the top and bottom of the display area in order to create a frame in which to display video using an aspect ratio different than that of the display. The letterbox method preserves the entire video picture, as opposed to pan & scan. DVD-Video players can automatically letterbox a widescreen picture for display on a standard 4:3 TV.

level

In MPEG-2, levels specify parameters such as resolution, bit rate, and frame rate. Compare to profile.

line doubler

A video processor that doubles the number of lines in the scanning system in order to create a display with scan lines that are less visible. Some line doublers convert from interlaced to progressive scan.

linear PCM

A coded representation of digital data that is not compressed. Linear PCM spreads values evenly across the range from highest to lowest, as opposed to nonlinear (companded) PCM which allocates more values to more important frequency ranges.

lines of horizontal resolution

Sometimes abbreviated as TVL (TV lines) or LoHR. A common but subjective measurement of the visually resolvable horizontal detail of an analog video system, measured in half-cycles per picture height. Each cycle is a pair of vertical lines, one black and one white. The measurement is usually made by viewing a test pattern to determine where the black and white lines blur into gray. The resolution of VHS video is commonly gauged at 240 lines of horizontal resolution, broadcast video at 330, laserdisc at 425, and DVD at 500 to 540. Because the measurement is relative to picture height, the aspect ratio must be taken into account when determining the number of vertical units (roughly equivalent to pixels) that can be displayed across the width of the display. For example, an aspect ratio of 1.33 multiplied by 540 gives 720 pixels.

L_0/R_0

Left only / right only. Stereo signal (no matrixed surround information). Optional downmixing output in Dolby Digital decoders. Does not change phase, simply folds surround channels forward into L_f and R_f.

locale

See regional code.

logical unit

A physical or virtual peripheral device, such as a DVD-ROM drive.

logical

An artificial structure or organization of information created for convenience of access or reference, usually different from the physical structure or organization. For example, the application specifications of DVD (the way information is organized and stored) are logical formats.

lossless compression

Compression techniques that allow the original data to be recreated without loss. Contrast with lossy compression.

lossy compression

Compression techniques that achieve very high compression ratios by permanently removing data while preserving as much significant information as possible. Lossy compression includes perceptual coding techniques that attempt to limit the data loss to that which is least likely to be noticed by human perception.

LP

Long-playing record. An audio recording on a plastic platter turning at 331/3 rpm and read by a stylus.

LPCM See linear PCM.

L_t/R_t

Left total/right total. Four surround channels matrixed into two channels. Mandatory downmixing output in Dolby Digital decoders.

luma (Y')

The brightness component of a color video image (also called the grayscale, monochrome, or black-and-white component). Nonlinear luminance. The standard luma signal is computed from nonlinear RGB as Y' = 0.299 R' + 0.587 G' + 0.114 B'.

luminance (Y)

Loosely, the sum of RGB tristimulus values corresponding to brightness. May refer to a linear signal or (incorrectly) a nonlinear signal.

M

M

Mega. An SI prefix for denominations of one million (10^6).

M byte

One million (10^6) bytes. Not to be confused with MB or megabyte (2^{20} bytes).

Mac OS

The operating system used by Apple Macintosh computers.

macroblock

In MPEG MP@ML, the four 8 × 8 blocks of luma information and two 8 × 8 blocks of chroma information form a 16 × 16 area of a video frame.

macroblocking

An MPEG artifact. See blocking.

Macrovision

An anti-taping process that modifies a signal so that it appears unchanged on most televisions but is distorted and unwatchable when played back from a videotape recording. Macrovision takes advantage of characteristics of AGC circuits and burst decoder circuits in VCRs to interfere with the recording process.

magneto-optical

Recordable disc technology using a laser to heat spots that are altered by a magnetic field. Other formats include dye-sublimation and phase-change.

Main data

User data portion of each sector. 2048 bytes.

main level (ML)

A range of proscribed picture parameters defined by the MPEG-2 video standard, with maximum resolution equivalent to ITU-R BT.601 (720 × 576 × 30). (Also see level.)

main profile (MP)

A subset of the syntax of the MPEG-2 video standard designed to be supported over a large range of mainstream applications such as digital cable TV, DVD, and digital satellite transmission. (Also see profile.)

mark

The non-reflective area of a writable optical disc. Equivalent to a pit.

master

The metal disc used to stamp replicas of optical discs. The tape used to make additional recordings.

mastering

The process of replicating optical discs by injecting liquid plastic into a mold containing a master. Often used inaccurately to refer to premastering.

matrix encoding

The technique of combining additional surround-sound channels into a conventional stereo signal. Also see Dolby Surround.

matte

An area of a video display or motion picture that is covered (usually in black) or omitted in order to create a differently shaped area within the picture frame.

MB

Megabyte.

Mbps

Megabits / second. Millions (10^6) of bits per second.

Media Key Block (MKB)

Set of keys used in CPPM and CPRM for authenticating players.

megabyte

1,048,576 (2^{20}) bytes.

megapixel

A term referring to an image or display format with a resolution of approximately 1 million pixels.

memory

Data storage used by computers or other digital electronics systems. Read-only memory (ROM) permanently stores data or software program instructions. New data cannot be written to ROM. Random-access memory (RAM) temporarily stores data—including digital audio and video—while it is being manipulated, and holds software application programs while they are being executed. Data can be read from and written to RAM. Other long-term memory includes hard disks, floppy disks, digital CD formats (CD-ROM, CD-R, and CD-RW), and DVD formats (DVD-ROM, DVD-R, and DVD-RAM).

Menu

In DVD-Video there are two kinds of menus, System Menus and Interactive Menus. There are six types of System Menus: Title Menu, Root Menu, Audio Menu, Sub-picture Menu, Angle Menu and PTT or Chapter Menu.

Meridian Lossless Packing (MLP)

A lossless compression technique (used by DVD-Audio) that removes redundancy from PCM audio signals to achieve a compression ratio of about 2:1 while allowing the signal to be perfectly recreated by the MLP decoder.

MHz

One million (10^6) Hz.

Microsoft Windows

The leading operating system for Intel CPU-based computers. Developed by Microsoft.

middle area

Unused physical area that marks the transition from layer 0 to layer 1. Middle Area only exists in dual layer discs where the tracks of each layer are in opposite directions.

Millennium Group

The group of companies proposing the Galaxy watermarking format. (Macrovision, Philips, Digimarc)

mixed mode

A type of CD containing both Red Book audio and Yellow Book computer data tracks.

MKB

See Media Key Block.

MLP

See Meridian Lossless Packing.

MO

Magneto-optical rewritable discs.

modulation

Replacing patterns of bits with different (usually larger) patterns designed to control the characteristics of the data signal. DVD uses 8/16 modulation, where each set of 8 bits is replaced by 16 bits before being written onto the disc.

mosquitoes

A term referring to the fuzzy dots that can appear around sharp edges (high spatial frequencies) after video compression. Also known as the Gibbs Effect.

mother

The metal disc produced from mirror images of the *father* disc in the replication process. Mothers are used to make stampers, often called sons.

motion compensation

In video decoding, the application of motion vectors to already-decoded blocks to construct a new picture.

motion estimation

In video encoding, the process of analyzing previous or future frames to identify blocks that have not changed or have only changed location. Motion vectors are then stored in place of the blocks. This is very computation-intensive and can cause visual artifacts when subject to errors.

motion vector

A two-dimensional spatial displacement vector used for MPEG motion compensation to provide an offset from the encoded position of a block in a reference (I or P) picture to the predicted position (in a P or B picture).

MP@ML

Main profile at main level. The common MPEG-2 format used by DVD (along with SP@SL).

MP3

MPEG-1 Layer III audio. A perceptual audio coding algorithm. Not supported in DVD-Video or DVD-Audio formats.

MPEG audio

Audio compressed according to the MPEG perceptual encoding system. MPEG-1 audio provides two channels, which can be in Dolby Surround format. MPEG-2 audio adds data to provide discrete multichannel audio. Stereo MPEG audio is the mandatory audio compression system for 625/50 (PAL/SECAM) DVD-Video.

MPEG video

Video compressed according to the MPEG encoding system. MPEG-1 is typically used for low data rate video such as on a Video CD. MPEG-2 is used for higher-quality video, especially interlaced video, such as on DVD or HDTV.

MPEG

Moving Pictures Expert Group. An international committee that developed the MPEG family of audio and video compression systems.

MPEG-1 video

Video encoded in accordance with the ISO / IEC 11172 specification.

MPEG-2 video

Video encoded in accordance with the ISO / IEC 13818 specification.

Mt. Fuji

See SFF 8090.

MTBF

Mean Time Between Failure. A measure of reliability for electronic equipment, usually determined in benchmark testing. The higher the MTBF, the more reliable the hardware.

Multi_PGC Title

In DVD-Video, a Title within a Video Title Set (VTS) that contains more than one Program Chain (PGC). Contrast with One_Sequential_PGC Title and One_Random_PGC Title.

multiangle

A DVD-Video program containing multiple angles allowing different views of a scene to be selected during playback.

multichannel

Multiple channels of audio, usually containing different signals for different speakers in order to create a surround-sound effect.

multilanguage

A DVD-Video program containing sound tracks and subtitle tracks for more than one language.

multimedia

Information in more than one form, such as text, still images, sound, animation, and video. Usually implies that the information is presented by a computer.

multiplexing

Combining multiple signals or data streams into a single signal or stream. Usually achieved by interleaving at a low level.

MultiRead

A standard developed by the Yokohama group, a consortium of companies attempting to ensure that new CD and DVD hardware can read all CD formats.

multisession

A technique in write-once recording technology that allows additional data to be appended after data written in an earlier session.

mux

Short for multiplex.

mux_rate

In MPEG, the combined rate of all packetized elementary streams (PES) of one program. The mux_rate of DVD is 10.08 Mbps.

N

NAB

National Association of Broadcasters.

Native resolution

The resolution at which the video file was captured.

Navigation Data

In DVD-Video there are five types of navigation data: Video Manager Information (VMGI), Video Title Set Information (VTSI), Program Chain Information (PGCI), Presentation Control Information (PCI) and Data Search Information (DSI).

Navigation Timer

In DVD-Video a system timer used during navigation operations.

NCTA

National Cable Television Association.

nighttime mode

Name for Dolby Digital dynamic range compression feature to allow low-volume nighttime listening without losing legibility of dialog.

noise floor

The level of background noise in a signal or the level of noise introduced by equipment or storage media below which the signal can't be isolated from the noise.

noise

Irrelevant, meaningless, or erroneous information added to a signal by the recording or transmission medium or by an encoding / decoding process. An advantage of digital formats over analog formats is that noise can be completely eliminated (although new noise may be introduced by compression).

NRZI

Non-Return To Zero, Inverted. A method of coding binary data as waveform pulses. Each transition represents a one, while lack of a transition represents a run of zeros.

NTSC

National Television Systems Committee. A committee organized by the Electronic Industries Association (EIA) that developed commercial television broadcast standards for the United States. The group first established black-and-white TV standards in 1941, using a scanning system of 525 lines at 60 fields per second. The second committee standardized color enhancements using 525 lines at 59.94 fields per second. NTSC refers to the composite color-encoding system. The 525 / 59.94 scanning system (with a 3.58-MHz color subcarrier) is identified by the letter M, and is often incorrectly referred to as NTSC. The NTSC standard is also used in Canada, Japan, and other parts of the world. NTSC is facetiously referred to as meaning "Never The Same Color" because of the system's difficulty in maintaining color consistency.

NTSC-4.43

A variation of NTSC where a 525 / 59.94 signal is encoded using the PAL subcarrier frequency and chroma modulation. Also called 60-Hz PAL.

numerical aperture (NA)

A unitless measure of the ability of a lens to gather and focus light. NA = $n \sin \theta$, where θ is the angle of the light as it narrows to the focal point. A numerical aperture of 1 implies no change in parallel light beams. The higher the number, the greater the focusing power and the smaller the spot.

O

OEM

Original equipment manufacturer. Computer maker.

One_Random_PGC Title

In DVD-Video, a Title within a Video Title Set (VTS) that contains a single Program Chain (PGC), but does not meet the requirements of a One_Sequential_PGC Title. Contrast with to One_Sequential_PGC Title and Multi_PGC Title.

One_Sequential_PGC Title

In DVD-Video, a Title within a Video Title Set (VTS) that contains a single Program Chain (PGC) with the following attributes: 1) PG Playback mode is Sequential, 2) no Next PGC, Previous PGC or Go Up PGCs are defined, and 3) the Navigation Timer is neither set, nor referred to. Contrast with One_Random_PGC Title and Multi_PGC Title.

operating system

The primary software in a computer, containing general instructions for managing applications, communications, input/output, memory and other low-level tasks. DOS, Windows, Mac OS, and UNIX are examples of operating systems.

Opposite Track Path (OTP)

Dual-layer disc where Layer 0 and Layer 1 have opposite track directions. Layer 0 reads from the inside to the outside of the disc, whereas Layer 1 reads from the outside to the inside. The disc always spins clockwise, regardless of track structure or layers. This mode facilitates movie playback by allowing seamless (or near-seamless) transition from one layer to another. In computer applications (DVD-ROM), it usually makes more sense to use the Parallel Track Path (PTP) format where random access time is more important.

Orange Book

The document begun in 1990 which specifies the format of recordable CD. Three parts define magneto-optical erasable (MO) and write-once (WO), dye-sublimation write-once (CD-R), and phase-change rewritable (CD-RW) discs. Orange Book added multisession capabilities to the CD-ROM XA format.

OS

Operating system.

OSTA

Optical Storage Technology Association (see http://www.osta.org).

OTP

See Opposite Track Path.

out of band

In a place not normally accessible.

Outer diameter

Width of the disc. This is 12 cm for “normal” CDs and DVDs, and 8 cm for small CDs and DVDs.

overscan

The area at the edges of a television tube that is covered to hide possible video distortion. Overscan typically covers about 4 or 5 percent of the picture.

P

P picture (or P frame)

In MPEG video, a "predicted" picture based on difference from previous pictures. P pictures (along with I pictures) provide a reference for subsequent P pictures or B pictures.

pack

A group of MPEG packets in a DVD-Video program stream. In DVD, a pack is the size of one sector (2048 bytes).

packet

A low-level unit of DVD-Video (MPEG) data storage containing contiguous bytes of data belonging to a single elementary stream such as video, audio, control, and so forth. Packets are grouped into packs.

packetized elementary stream (PES)

The low-level stream of MPEG packets containing an elementary stream, such as audio or video.

PAL

Phase Alternate Line. A video standard used in Europe and other parts of the world for composite color encoding. Various version of PAL use different scanning systems and color subcarrier frequencies (identified with letters B, D, G, H, I, M, and N), the most common being 625 lines at 50 fields per second, with a color subcarrier of 4.43 MHz. PAL is also said to mean "picture always lousy" or "perfect at last," depending on which side of the ocean the speaker comes from.

palette

A table of colors that identifies a subset from a larger range of colors. The small number of colors in the palette allows fewer bits to be used to represent each pixel. Also called a color look-up table (CLUT).

pan & scan

The technique of reframing a picture to conform to a different aspect ratio by cropping parts of the picture. DVD-Video players can automatically create a 4:3 pan & scan version from widescreen video by using a horizontal offset encoded with the video, which allows the focus of attention to always be visible.

Parallel Track Path (PTP)

Parallel track path. A variation of DVD dual-layer disc layout where readout begins at the center of the disc for both layers. Designed for separate programs (such as a widescreen and a pan & scan version on the same disc side) or programs with a variation on the second layer. Also most efficient for DVD-ROM random-access application. Contrast with OTP.

parental management

An optional feature of DVD-Video that prohibits programs from being viewed or substitutes different scenes within a program depending on the parental level set in the player. Parental control requires that parental levels and additional material (if necessary) be encoded on the disc.

part of title (PTT)

In DVD-Video, a division of a Title representing a scene. Also called a chapter. Parts of titles are numbered 1 to 99 in a One_Sequential_PGC Title and 1 to 999 in a Multi_PGC Title.

PCI

Presentation control information. A DVD-Video data stream containing details of the timing and presentation of a program (aspect ratio, angle change, menu highlight and selection information, and so on). PCI and DSI together make up an overhead of about 1 Mbps.

PCM

An uncompressed, digitally coded representation of an analog signal. The waveform is sampled at regular intervals and a series of pulses in coded form (usually quantized) are generated to represent the amplitude.

PC-TV

The merger of television and computers. A personal computer capable of displaying video as a television.

pel

See pixel.

perceived resolution

The apparent resolution of a display from the observer's point of view, based on viewing distance, viewing conditions, and physical resolution of the display.

perceptual coding

Lossy compression techniques based on the study of human perception. Perceptual coding systems identify and remove information that is least likely to be missed by the average human observer.

PES

See Packetized Elementary Stream.

PGCI

Program Chain Information. Data describing a chain of cells (grouped into programs) and their sector locations, thus composing a sequential program. PGCI data is contained in the PCI stream.

phase-change

A technology for rewritable optical discs using a physical effect in which a laser beam heats a recording material to reversibly change an area from an amorphous state to a crystalline state, or vice versa. Continuous heat just above the melting point creates the crystalline state (an erasure), while high heat followed by rapid cooling creates the amorphous state (a mark). (Other recording technologies include dye-sublimation and magneto-optical.)

Photo CD

Kodak's Photo CD for representing 24-bit 4:2:0 YCbCr images hierarchically at resolutions of up to 3072 × 2048 pixels. Thumbnails image representation is also part of the Photo CD spec. Built upon CD-ROM XA.

physical format

The low-level characteristics of the DVD-ROM and DVD-Video standards, including pits on the disc, location of data, and organization of data according to physical position.

physical sector number

Serial number assigned to physical sectors on a DVD disc. Serial incremented numbers are assigned to sectors from the head sector in the Data Area as 30000h from the start of the Lead In Area to the end of the Lead Out Area.

picture stop

A function of DVD-Video where a code indicates that video playback should stop and a still picture be displayed.

picture

In video terms, a single still image or a sequence of moving images. Picture generally refers to a frame, but for interlaced frames may refer instead to a field of the frame. In a more general sense, picture refers to the entire image shown on a video display.

PIP

Picture in picture. A feature of some televisions that shows another channel or video source in a small window superimposed in a corner of the screen.

pit

The depressed area of an optical disc.

pit art

A pattern of pits to be stamped onto a disc to provide visual art rather than data. A cheaper alternative to a printed label.

pit

A microscopic depression in the recording layer of a disc. Pits are usually 1/4 of the laser wavelength so as to cause cancellation of the beam by diffraction.

Pit length

Arc length of pit along the direction of the track.

pixel aspect ratio

The ratio of width to height of a single pixel. Often means sample pitch aspect ratio (when referring to sampled digital video). Pixel aspect ratio for a given raster can be calculated as y/x × w/h (where x and y are the raster horizontal pixel count and vertical pixel count, and w and h are the display aspect ratio width and height). Pixel aspect ratios are also confusingly calculated as x/y × w/h, giving a height-to-width ratio.

pixel depth

See color depth.

pixel

The smallest picture element of an image (one sample of each color component). A single dot of the array of dots that makes up a picture. Sometimes abbreviated to pel. The resolution of a digital display is typically specified in terms of pixels (width by height) and color depth (the number of bits required to represent each pixel).

Player

Embodiment of a DVD decoder system which executes the Navigation system and performs all decoding from the channel layer at least up to the track buffer layer. In future, external MPEG decoders may perform the actual video and audio reconstruction, but copyright issues currently prevent this.

Player Reference Model

Defines the ideal behavior of a DVD (compliant) Player.

PMMA

Polymethylmethacrylate. A clear acrylic compound used in laserdiscs and as an intermediary in the surface transfer process (STP) for dual-layer DVDs. PMMA is also sometimes used for DVD substrates.

POP

Picture outside picture. A feature of some widescreen displays that uses the unused area around a 4:3 picture to show additional pictures.

Post-command

In DVD-Video a navigation command to be executed after the presentation of a Program Chain (PGC) has been completed.

Pre-command

In DVD-Video a navigation command to be execute before the presentation of a Program Chain (PGC) has been started.

premastering

The process of preparing data in the final format to create a DVD disc image for mastering. Includes creating DVD control and navigation data, multiplexing data streams together, generating error-correction codes, and performing channel modulation. Often includes the process of encoding video, audio, and subpictures.

presentation data

DVD-Video information such as video, menus, and audio which is presented to the viewer. (See PCI.)

profile

In MPEG-2, profiles specify syntax and processes such as picture types, scalability, and extensions. Compare to level.

Program Chain (PGC)

In DVD-Video, a collection of programs, or groups of cells, linked together to create a sequential presentation.

Program (PG)

In a general sense, a sequence of audio or video. In a technical sense for DVD-Video, a group of cells within a Program Chain (PGC).

progressive scan

A video scanning system that displays all lines of a frame in one pass. Contrast with interlaced scan.

psychoacoustic

See perceptual encoding.

PTP

See Parallel Track Path.

PTT Menu

In DVD-Video, a menu used to access specific Part of Title (PTT) in a Video Title Set (VTS). Usually referred to as a Chapter Menu.

PUH

Pickup Head. The assembly of optics and electronics that reads data from a disc.

Q

QCIF

Quarter Common Intermediate Format. Video resolution of 176 × 144.

quantization levels

The predetermined levels at which an analog signal can be sampled as determined by the resolution of the analog-to-digital converter (in bits per sample); or the number of bits stored for the sampled signal.

quantize

To convert a value or range of values into a smaller value or smaller range by integer division. Quantized values are converted back (by multiplying) to a value which is close to the original but may not be exactly the same. Quantization is a primary technique of lossless encoding.

QuickTime

A digital video software standard developed by Apple Computer for Macintosh (Mac OS) and Windows operating systems. QuickTime is used to support audio and video from a DVD.

QXGA

A video graphics resolution of 2048 × 1536.

R

RAM (Random-Access Memory)

Generally refers to solid-state chips. In the case of DVD-RAM, the term was borrowed to indicate ability to read and write at any point on the disc.

RAMbo drive

A DVD-RAM drive capable of reading and writing CD-R and CD-RW media. (A play on the word "combo.")

random access

The ability to jump to a point on a storage medium.

raster

The pattern of parallel horizontal scan lines that makes up a video picture.

read-modify-write

An operation used in writing to DVD-RAM discs. Because data can be written by the host computer in blocks as small as 2 KB, but the DVD format uses ECC blocks of 32 KB, an entire ECC block is read from the data buffer or disc, modified to include the new data and new ECC data, then written back to the data buffer and disc.

Red Book

The document first published in 1982 that specifies the original compact disc digital audio format developed by Philips and Sony.

Reed-Solomon

An error-correction encoding system that cycles data multiple times through a mathematical transformation in order to increase the effectiveness of the error correction, especially for burst errors (errors concentrated closely together, as from a scratch or physical defect). DVD uses rows and columns of Reed-Solomon encoding in a two-dimensional lattice, called Reed-Solomon product code (RS-PC).

reference picture (or reference frame)

An encoded frame that is used as a reference point from which to build dependent frames. In MPEG-2, I pictures and P pictures are used as references.

reference player

A DVD player that defines the ideal behavior as specified by the DVD-Video standard.

regional code

A code identifying one of the world regions for restricting DVD-Video playback.

regional management

A mandatory feature of DVD-Video to restrict the playback of a disc to a specific geographical region. Each player and DVD-ROM drive includes a single regional code, and each disc side can specify in which regions it is allowed to be played. Regional coding is optional—a disc without regional codes will play in all players in all regions.

replication

1) The reproduction of media such as optical discs by stamping (contrast with duplication); 2) a process used to increase the size of an image by repeating pixels (to increase the horizontal size) and / or lines (to increase the vertical size) or to increase the display rate of a video stream by repeating frames. For example, a 360 × 240 pixel image can be displayed at 720 × 480 size by duplicating each pixel on each line and then duplicating each line. In this case the resulting image contains blocks of four identical pixels. Obviously, image replication can cause blockiness. A 24-fps video signal can be displayed at 72 fps by repeating each frame three times. Frame replication can cause jerkiness of motion. Contrast with decimation. Also see interpolate.

resampling

The process of converting between different spatial resolutions or different temporal resolutions. This may be based on simple sampling of the source information at higher or lower resolution or may include interpolation to correct for differences in pixel aspect ratios or to adjust for differences in display rates.

Reserved bytes

6 bytes in the header of each DVD sector reserved for future use.

reserved (reserved field)

The field indicated by the term “reserved” may be used in future revisions of the DVD specifications. Unless otherwise indicated all reserved bits shall be set to zero.

resolution

1) A measurement of relative detail of a digital display, typically given in pixels of width and height; 2) the ability of an imaging system to make clearly distinguishable or resolvable the details of an image. This includes spatial resolution (the clarity of a single image), temporal resolution (the clarity of a moving image or moving object), and perceived resolution (the apparent resolution of a display from the observer's point of view). Analog video is often measured as a number of lines of horizontal resolution over the number of scan lines. Digital video is typically measured as a number of horizontal pixels by vertical pixels. Film is typically measured as a number of line pairs per millimeter; 3) the relative detail of any signal, such as an audio or video signal. Also see lines of horizontal resolution.

RGB

Video information in the form of red, green, and blue tristimulus values. The combination of three values representing the intensity of each of the three colors can represent the entire range of visible light.

RLE

See Run length coding.

RMA

Region Management information. In DVD-Video, an 8-bit (1 byte) value stored in the CPR_MAI that indicates in which regions of the world a disc is permitted to play. See regional management.

ROM

Read-only memory.

Root Menu

Menu used to access other interactive menus in the Video Tile Set Manager domain, or to make a selection which is not defined by other system menus such as Angle Menu, Audio, Menu, PTT Menu and Sub-picture Menu.

rpm

Revolutions per minute. A measure of rotational speed.

RS

See Reed-Solomon.

RS-CIRC

See CIRC.

RSDL

Reverse-spiral dual-layer. See Opposite Track Path (OTP).

RS-PC

Reed-Solomon Product Code. An error-correction encoding system used by DVD employing rows and columns of Reed-Solomon encoding to increase error-correction effectiveness.

Run-length coding (RLE)

Lossless compression method that exploits contiguous samples with same value.

R-Y, B-Y

The general term for color-difference video signals carrying red and blue color information, where the brightness (Y) has been subtracted from the red and blue RGB signals to create R-Y and B-Y color-difference signals.

S

S/N

Signal-to-noise ratio. Also called SNR.

S/P DIF

Sony/Philips digital interface. A consumer version of the AES/EBU digital audio transmission standard. Most DVD players include S/P DIF coaxial digital audio connectors providing PCM and encoded digital audio output.

sample rate

The number of times a digital sample is taken, measured in samples per second, or Hertz. The more often samples are taken, the better a digital signal can represent the original analog signal. Sampling theory states that the sampling frequency must be more than twice the signal frequency in order to reproduce the signal without aliasing. DVD PCM audio allows sampling rates of 48 and 96 kHz.

sample size

The number of bits used to store a sample. Also called resolution. In general, the more bits allocated per sample, the better the reproduction of the original analog information. Audio sample size determines the dynamic range. DVD PCM audio uses sample sizes of 16, 20, or 24 bits.

sample

A single digital measurement of analog information. A snapshot in time of a continuous analog waveform. See sampling.

sampling

Converting analog information into a digital representation by measuring the value of the analog signal at regular intervals, called samples, and encoding these numerical values in digital form. Sampling is often based on specified quantization levels. Sampling may also be used to adjust for differences between different digital systems (see resampling and subsampling).

saturation

The intensity or vividness of a color.

scaling

Altering the spatial resolution of a single image to increase or reduce the size; or altering the temporal resolution of an image sequence to increase or decrease the rate of display. Techniques include decimation, interpolation, motion compensation, replication, resampling, and subsampling. Most scaling methods introduce artifacts.

scan line

A single horizontal line traced out by the scanning system of a video display unit. 525/60 (NTSC) video has 525 scan lines, about 480 of which contain actual picture. 625/50 (PAL/SECAM) video has 625 scan lines, about 576 of which contain actual picture.

scanning velocity

The speed at which the laser pickup head travels along the spiral track of a disc.

SCMS

Serial copy management system. Used by DAT, MiniDisc, and other digital recording systems to control copying and limit the number of copies that can be made from copies.

SCSI

Small Computer Systems Interface. An electronic interface and command set for attaching and controlling internal or external peripherals, such as a DVD-ROM drive, to a computer. The command set of SCSI was extended for DVD-ROM devices by the SFF 8090 specification.

SDDI

Serial Digital Data Interface. A digital video interconnect designed for serial digital information to be carried over a standard SDI connection.

SDDS

Sony Dynamic Digital Sound. A perceptual audio-coding system developed by Sony for multichannel audio in theaters. A competitor to Dolby Digital and an optional audio track format for DVD.

SDI

See Serial Digital Interface. Also Strategic Defense Initiative, a.k.a. Star Wars, which as of 2000 was still not available on DVD other than as bootleg copies.

SDMI

Secure Digital Music Initiative. Efforts and specifications for protecting digital music.

SDTV

Standard-definition television. A term applied to traditional 4:3 television (in digital or analog form) with a resolution of about 700 × 480 (about 1/3 megapixel). Contrast with HDTV.

seamless playback

A feature of DVD-Video where a program can jump from place to place on the disc without any interruption of the video. Allows different versions of a program to be put on a single disc by sharing common parts.

SECAM

Séquential Couleur Avec Mémoire / Sequential Color with Memory. A composite color standard similar to PAL, but currently used only as a transmission standard in France and a few other countries. Video is produced using the 625/50 PAL standard and is then transcoded to SECAM by the player or transmitter.

sector

A logical or physical group of bytes recorded on the disc—the smallest addressable unit. A DVD sector contains 38,688 bits of channel data and 2048 bytes of user data.

Sector information

Header field providing the sector number.

Sector number

A number that uniquely identifies the physical sector on a disc.

seek time

The time it takes for the head in a drive to move to a data track.

Serial Digital Interface (SDI)

The professional digital video connection format using a 270 Mbps transfer rate. A 10-bit, scrambled, polarity-independent interface, with common scrambling for both component ITU-R 601 and composite digital video and four groups each of four channels of embedded digital audio. SDI uses standard 75-ohm BNC connectors and coax cable.

SFF 8090

Specification number 8090 of the Small Form Factor Committee, an ad hoc group formed to promptly address disk industry needs and to develop recommendations to be passed on to standards organizations. SFF 8090 (also known as the Mt. Fuji specification), defines a command set for CD-ROM– and DVD-ROM–type devices, including implementation notes for ATAPI and SCSI.

SI

Système International (d'Unités) / International System (of Units). A complete system of standardized units and prefixes for fundamental quantities of length, time, volume, mass, and so on.

signal-to-noise ratio

The ratio of pure signal to extraneous noise, such as tape hiss or video interference. Signal-to-noise ratio is measured in decibels (dB). Analog recordings almost always have noise. Digital recordings, when properly pre-filtered and not compressed, have no noise.

simple profile (SP)

A subset of the syntax of the MPEG-2 video standard designed for simple and inexpensive applications such as software. SP does not allow B pictures. See profile.

simulate

To test the function of a DVD disc in the authoring system, without actually formatting an image.

SMPTE

The Society of Motion Picture and Television Engineers. An international research and standards organization. The SMPTE time code, used for marking the position of audio or video in time, was developed by this group.

son

The metal disc produced from a *mother* disc in the replication process. Fathers or sons are used in molds to stamp discs.

SP@ML

Simple profile at main level. The simplest MPEG-2 format used by DVD. Most discs use MP@ML. SP does not allow B pictures.

space

The reflective area of a writable optical disc. Equivalent to a land.

spatial resolution

The clarity of a single image or the measure of detail in an image. See resolution.

spatial

Relating to space, usually two-dimensional. Video can be defined by its spatial characteristics (information from the horizontal plane and vertical plane) and its temporal characteristics (information at different instances in time).

squeezed video

See anamorphic.

stamping

The process of replicating optical discs by injecting liquid plastic into a mold containing a stamper (*father* or *son*). Also (inaccurately) called mastering.

STP

Surface transfer process. A method of producing dual-layer DVDs that sputters the reflective (aluminum) layer onto a temporary substrate of PMMA, then transfers the metalized layer to the already-molded layer 0.

stream

A continuous flow of data, usually digitally encoded, designed to be processed sequentially. Also called a bitstream.

Subpicture Menu

Menu used to select a subpicture stream

subpicture

Graphic bitmap overlays used in DVD-Video to create subtitles, captions, karaoke lyrics, menu highlighting effects, and so on.

subsampling

The process of reducing spatial resolution by taking samples that cover larger areas than the original samples or of reducing temporal resolutions by taking samples that cover more time than the original samples. See chroma subsampling. Also called downsampling.

substrate

The clear polycarbonate disc onto which data layers are stamped or deposited.

subtitle

A textual representation of the spoken audio in a video program. Subtitles are often used with foreign languages and do not serve the same purpose as captions for the hearing impaired. See subpicture.

surround sound

A multichannel audio system with speakers in front of and behind the listener to create a surrounding envelope of sound and to simulate directional audio sources.

SVCD

Super Video Compact Disc. MPEG-2 video on CD. Used primarily in Asia.

SVGA

A video graphics resolution of 800 × 600 pixels.

S-VHS

Super VHS (Video Home System). An enhancement of the VHS videotape standard using better recording techniques and Y / C signals. The term S-VHS is often used incorrectly to refer to s-video signals and connectors.

s-video

A video interface standard that carries separate luma and chroma signals, usually on a four-pin mini-DIN connector. Also called Y / C. The quality of s-video is significantly better than composite video since it does not require a comb filter to separate the signals, but it's not quite as good as component video. Most high-end televisions have s-video inputs. S-video is often erroneously called S-VHS.

SXGA

A video graphics resolution of 1280 × 1024 pixels.

Sync frame

Physical record unit of 1488 channel bits length comprising data (91 bytes) and a SYNC code. One physical sector consists of 26 sync frames.

sync

A video signal (or component of a video signal) containing information necessary to synchronize the picture horizontally and vertically. Also, specially formatted data on disc which helps the readout system identify location and specific data structures.

syntax

The rules governing construction or formation of an orderly system of information. For example, the syntax of the MPEG video encoding specification defines how data and associated instructions are used by a decoder to create video pictures.

system menu

The main menu of a DVD-Video disc, from which titles are selected. Also called the title selection menu or disc menu.

T

T

Tera. An SI prefix for denominations of one trillion (10^{12}).

telecine artist

The operator of a telecine machine. Also called a colorist.

telecine

The process (and the equipment) used to transfer film to video. The telecine machine performs 3:2 pulldown by projecting film frames in the proper sequence to be captured by a video camera.

temporal resolution

The clarity of a moving image or moving object, or the measurement of the rate of information change in motion video. See resolution.

temporal

Relating to time. The temporal component of motion video is broken into individual still pictures. Because motion video can contain images (such as backgrounds) that do not change much over time, typical video has large amounts of temporal redundancy.

TIF or TIFF

Tag Image File Format. A common graphic file format supported by most DVD-Video authoring tools for the importation of still images, menu backgrounds and highlight overlay images.

tilt

A mechanical measurement of the warp of a disc. Usually expressed in radial and tangential components: radial indicating dishing and tangential indicating ripples in the perpendicular direction.

time code

Information recorded with audio or video to indicate a position in time. Usually consists of values for hours, minutes, seconds, and frames. Also called SMPTE time code. Some DVD-Video material includes information to allow the player to search to a specific time code position.

title key

A value used to encrypt and decrypt (scramble) user data on DVD-Video discs.

title

The largest unit of a DVD-Video disc (other than the entire volume or side). Usually a movie, TV program, music album, or so on. A disc can hold up to 99 titles, which can be selected from the disc menu. Entire DVD volumes are also commonly called titles.

track buffer

Circuitry (including memory) in a DVD player that provides a variable stream of data (up to 10.08 Mbps) to the system decoders of data coming from the disc at a constant rate of 11.08 Mbps (except for breaks when a different part of the disc is accessed).

track pitch

The distance (in the radial direction) between the centers of two adjacent tracks on a disc. DVD-ROM standard track pitch is 0.74 mm.

track

1) A distinct element of audiovisual information, such as the picture, a sound track for a specific language, or the like. DVD-Video allows one track of video (with multiple angles), up to 8 tracks of audio, and up to 32 tracks of subpicture; 2) one revolution of the continuous spiral channel of information recorded on a disc.

transfer rate

The speed at which a certain volume of data is transferred from a device such as a DVD-ROM drive to a host such as a personal computer. Usually measured in bits per second or bytes per second. Sometimes confusingly used to refer to data rate, which is independent of the actual transfer system.

transform

The process or result of replacing a set of values with another set of values. A mapping of one information space onto another.

trim

See crop.

tristimulus

A three-valued signal that can match nearly all colors of visible light in human vision. This is possible because of the three types of photoreceptors in the eye. RGB, YC_bC_r, and similar signals are tristimulus, and can be interchanged by using mathematical transformations (subject to possible loss of information).

TVL

Television Line. See lines of horizontal resolution.

TWG

Technical Working Group. A general term for an industry working group. Specifically, the predecessor to the CPTWG.

twos complement

The number calculated so that each bit of a binary number is inverted (ones are replaced with zeros and vice versa), then one (=000…0001b) is added ignoring the overflow.

U

UDF Bridge

A combination of UDF and ISO 9660 file system formats that provides backward-compatibility with ISO 9660 readers while allowing full use of the UDF standard.

UDF (Universal Disc Format)

A standard developed by the Optical Storage Technology Association designed to create a practical and usable subset of the ISO / IEC 13346 recordable, random-access file system and volume structure format.

Unidirectional prediction

A form of compression in which the codec uses information only from frames that have already been decompressed.

universal DVD

A DVD designed to play in DVD-Audio and DVD-Video players (by carrying a Dolby Digital audio track in the DVD-Video zone).

universal DVD player

A DVD player that can play both DVD-Video and DVD-Audio discs.

user data

The data recorded on a disc independent of formatting and error-correction overhead. Each DVD sector contains 2048 bytes of user data.

UXGA

A video graphics resolution of 1600 × 1200.

V

VBI

Vertical blanking interval. The scan lines in a television signal that do not contain picture information. These lines are present to allow the electron scanning beam to return to the top and are used to contain auxiliary information such as closed captions.

VBR

Variable bit rate. Data that can be read and processed at a volume that varies over time. A data compression technique that produces a data stream between a fixed minimum and maximum rate. A constant level of compression is generally maintained, with the required bandwidth increasing or decreasing depending on the complexity (the amount of spatial and temporal energy) of the data being encoded. In other words, data rate is held constant while quality is allowed to vary. Compare to CBR.

VBScript

A proprietary Visual Basic-based programming language defined by Microsoft for use in their Internet Explorer Web browser. (See also, JavaScript and JScript, above.)

VBV

Video buffering verifier. A hypothetical decoder that is conceptually connected to the output of an MPEG video encoder. Provides a constraint on the variability of the data rate that an encoder can produce.

VCAP (Video Capable Audio Player)

An audio player which can read the limited subset of video features defined for the DVD-Audio format. (Contrast with universal DVD player.)

VCD

Video Compact Disc. Near-VHS-quality MPEG-1 video on CD. Used primarily in Asia.

VfW

See Video for Windows.

VGA (Video Graphics Array)

A standard analog monitor interface for computers. Also a video graphics resolution of 640 × 480 pixels.

VHS

Video Home System. The most popular system of videotape for home use. Developed by JCV.

Video CD

An extension of CD based on MPEG-1 video and audio. Allows playback of near-VHS-quality video on a Video CD player, CD-i player, or computer with MPEG decoding capability.

Video for Windows

The system software additions used for motion video playback in Microsoft Windows. Replaced in newer versions of Windows by DirectShow (formerly called ActiveMovie).

Video Manager (VMG)

In DVD-Video, the information and data to control one or more Video Title Sets (VTS) and Video Manager Menu (VMGM). It is composed of the Video Manager Information (VMGI), the Video Object Set for Video Manager Menu (VMGM_VOBS), and a backup of the VMGI (VMGI_BUP).

Video Title Set (VTS)

In DVD-Video, a collection of Titles and Video Title Set Menu (VTSM) to control 1 to 99 Titles. It is composed of the Video Title Set Information (VTSI), the Video Object Set for the Menu (VTSM_VOBS), the Video Object Set for the Title (VTST_VOBS), and a backup of the VTSI (VTSI_BUP).

VIDEO_TS

UDF file name used for video directory on disc volume. Files under this directory name contain pointers to the sectors on the disc which hold the program streams.

videophile

Someone with an avid interest in watching videos or in making video recordings. Videophiles are often very particular about audio quality, picture quality, and aspect ratio to the point of snobbishness.

VLC (Variable Length Coding)

See Huffman coding.

VMGI (Video Manager Information)

Information required to manage one or more Video Title Sets and Video Manager Menu areas. This is non real time data located at the start of the Video Manager area.

VOB (Video Object)

A single, complete file composed of multiplexed Video, Audio, Sub-picture, PCI and DSI elementary streams, and consisting of an integer number of VOBUs.

VOBS (Video Object Set)

A collection of one or more VOBs. There are three types: 1) VMGM_VOBS for the Video Manager Menu (VMGM) area, 2) VTSM_VOBS for the Video Titles Set Menu (VTSM) area, and 3) VTST_VOBS for the Video Title Set Title (VTST) area.

VOBU (Video Object Unit)

A small (between 0.4 and 1.0 seconds) physical unit of DVD-Video data storage, usually the length of one GOP, that begins with a Navigation pack (NV_PCK) and usually includes an integer number of GOPs.

Volume Management Information

Identifies disc side and content type.

Volume Space

Collection of sectors that make the volume. Not all sectors on the disc comprise the volume. Some near the inner and out spiral are used as leader.

volume

A logical unit representing all the data on one side of a disc.

VSDA

Video Software Dealers Association.

VTSI (Video Title Set Information)

Information required to manage one or more Titles and Video Title Set Menus. This is non real time data located at the start of the Video Title Set.

W

WAEA

World Airline Entertainment Association. Discs produced for use in airplanes contain extra information in a WAEA directory. The in-flight entertainment working group of the WAEA petitioned the DVD Forum to assign region 8 to discs intended for in-flight use.

watermark

Information hidden as “invisible noise” or “inaudible noise” in a video or audio signal.

White Book

The document from Sony, Philips, and JVC, begun in 1993 that extended the Red Book compact disc format to include digital video in MPEG-1 format. Commonly called Video CD.

widescreen

A video image wider than the standard 1.33 (4:3) aspect ratio. When referring to DVD or HDTV, widescreen usually indicates a 1.78 (16:9) aspect ratio.

window

A usually rectangular section within an entire screen or picture.

Windows

See Microsoft Windows.

X

XA

See CD-ROM XA.

XGA

A video graphics resolution of 1024 × 768 pixels.

XVCD

A non-standard variation of VCD.

Y

Y

The luma or luminance component of video: brightness independent of color.

Y/C

A video signal in which the brightness (luma, Y) and color (chroma, C) signals are separated. Also called S-video.

YC_bC_r

A component digital video signal containing one luma and two chroma components. The chroma components are usually adjusted for digital transmission according to ITU-R BT.601. DVD-Video's MPEG-2 encoding is based on 4:2:0 YC_bC_r signals. YC_bC_r applies only to digital video, but is often incorrectly used in reference to the YP_bP_r analog component outputs of DVD players.

Yellow Book

The document produced in 1985 by Sony and Philips that extended the Red Book compact disc format to include digital data for use by a computer. Commonly called CD-ROM.

YP_bP_r

A component analog video signal containing one luma and two chroma components. Often referred to loosely as YUV or Y, B-Y, R-Y.

YUV

In the general sense, any form of color-difference video signal containing one luma and two chroma components. Technically, YUV is applicable only to the process of encoding component video into composite video. See YC_bC_r and YP_bP_r.

Z

ZCLV

Zoned constant linear velocity. Concentric rings on a disc within which all sectors are the same size. A combination of CLV and CAV.

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