

CD and DVD Glossary

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This glossary comprises definitions of abbreviations and terminology used for CD and DVD technology, manufacturing and applications. The definitions should be taken as a guide only and reference should be made to more complete descriptions available elsewhere including Disctronics documents on CD and DVD technology and manufacturing.

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5.1: A surround sound format comprising 5 full bandwidth channel (left, centre, right, left surround and right surround) plus a low frequency effects channel (**LFE**).

A:

a_characters: The ISO 9660 character set used in the Volume Descriptors and comprising 'A' to 'Z', '0' to '9', space plus symbols.

A-Time: Absolute-timecode for CDs, contained in the subcode Q-channel as minutes, seconds and frames measured from the beginning of the disc.

AC-3: Dolby's 5.1 channel surround sound digital audio system, specified for DVD-Video discs. It is now referred to as **Dolby Digital**.

ADPCM: Adaptive Differential Pulse Code Modulation is an audio encoding compression technique that encodes the difference between the predicted value of the signal instead of the absolute value of the original waveform so that the compression efficiency is improved. This difference is usually small and can thus be encoded in fewer bits than the sample itself. ADPCM is used in PC sound cards, on **CD-i** and **CD-ROM XA** discs.

AFM: Atomic Force Microscopy, a technique for measuring the topology of 'bumps' on a CD or DVD stamper, to ensure that the mastering and electroforming processes are creating stampers that will result in good pit geometry.

Al: The chemical symbol for Aluminium, used for the reflective layer on CD and DVD discs.

Album: One side of a DVD-Audio disc, containing **Groups** and **Tracks**.

Aliasing: A form of image distortion associated with signal sampling at low resolutions. The result is that diagonal lines appear stepped (like a staircase).

Amaray Case: A plastic clamshell type case designed for DVD discs to differentiate them from CDs and to protect them. It is similar to clamshell cases used for VHS cassettes but is wider and thinner.

Analogue: The representation of numerical values by physical variables such as voltage, current, etc. Analogue devices are characterized by dials and sliding mechanisms.

Analogue Video: A video signal that represents an infinite number of smooth gradations between given video levels. By contrast, a digital video signal assigns a finite set of levels. Analogue signals are prone to the effects of noise, but digital signals are less affected by noise.

Anamorphic: A term used to describe the representation of a wide-screen video image by squeezing it horizontally to fit into a conventional 4:3 aspect ratio for purposes of storage and transmission. The image is stretched back to wide screen (usually 16:9) before being displayed.

Angles: On a **DVD-Video** disc up to 9 camera angles can be used so that different views of a scene can be included and the user is able to switch from one to another while watching the video sequence. An example is a pop concert, where the viewer can choose which performer to view and change the view (angle) during the video.

Anti-aliasing: A form of interpolation used when combining images to provide a smooth transition between pixels. A good example is text over a plain or textured background. This will require the use of additional shades of colour and intensity between the foreground text colour and the background.

AOB: Audio Object, a file on a DVD-Audio disc containing the audio information. AOBs are equivalent to **VOBs** used on **DVD-Video** discs.

APRS: Association of Professional Recording Services. The APRS is a UK organisation that promotes the highest standards of professionalism and quality within the audio industry. Its members are recording studios, post-production houses, mastering, replication, pressing and duplicating facilities, and providers of education and training, as well as audio engineers, manufacturers, suppliers, and consultants. Its primary aim is to develop and maintain excellence at all levels within the audio industry of the United Kingdom. (see www.aprs.co.uk)

APS: Analogue Protection System, Macrovision's copy protection system for **DVD-Video** that distorts the video output so that after being recorded to VHS tape and then played back the video is unwatchable.

Artefact: An unintended, unwanted visual aberration in a video image

ASCII: American Standard Code for Information Interchange for representing text characters. The ASCII character set is the basic set used by computers for many years.

Aspect Ratio: The relationship of width and height of **pixels** in an image.

ASV: Audio Still Video, a still image on a **DVD-Audio** disc. Up to 20 high quality ASVs can be loaded into the player memory before the audio is played and so can be replaced between tracks where an audio mute is acceptable.

ATRAC: Adaptive Transform Acoustic Coding, a method to compress audio data and used in the MiniDisc.

Au: The chemical symbol for Gold, used for the semi-reflective layer (**Layer 0**) of dual layer **DVD-9** discs.

Authoring System: Software that helps developers design interactive courseware easily, without the painstaking detail of computer programming.

Autoplay: A feature (eg within Windows 95 or 98) for example allowing a CD-ROM disc to play automatically when inserted.

AVI: Audio Video Interleaved. File format for digital video and audio under Windows. File format is cross-platform compatible, allowing *.AVI video files to be played under other operating systems.

B:

B-Frame: Bidirectionally predictive-coded frame is a frame (in an **MPEG** sequence) that is coded using motion compensated prediction from past and/or future reference frames.

Bass Management: A method used for surround sound systems for directing the lowest frequencies from, say, a 5-channel surround system to a single **subwoofer**. This allows relatively small satellite speakers to be used for the 5 channels plus a subwoofer, while maintaining high quality and a full frequency range, which is particularly important for **DVD-Audio**.

BBFC: British Board of Film Classification, the UK authority designated by the Home Secretary with responsibility for classifying videos (now both VHS and DVD-Video) under the 1984 Video Recordings Act.

BCA: Burst Cutting Area, an annular area within the **DVD** disc hub where a bar code can be written for additional information such as serial numbers.

Bit: A binary digit with values 0 or 1 used in binary computers (ie all computers in use)

Bitmap: Representation of characters or graphics by individual **pixels** arranged in row (horizontal) and column (vertical) order.

Bit Rate: The rate at which the compressed bitstream is delivered from the storage medium to the input of a decoder.

BLER: Block Error Rate, a QA measurement for CDs, which, according to the **Red Book**, must be not more than 220 block errors per second.

Block: An 8-row by 8-column matrix of pixels, or 64 DCT coefficients used in **JPEG & MPEG** compression.

Block: Unit of data on a **CD** containing 24 user data bytes, plus error correction and detection bytes. There are 7350 Blocks per second on a CD.

Blue Book: Specification from Philips & Sony that defines the **Enhanced Music CD (CD Extra)** for audio and data.

Bonding: The process of joining two substrates to make a **DVD** disc. The bonding process can be hot melt (for **DVD-5** and **DVD-10**) or UV bonding (for **DVD-9** where the bonding layer needs to be optically transparent).

BSA: The Business Software Alliance, the voice of the world's leading software developers before governments and with consumers in the international marketplace.

BVA: British Video Association, which represents the UK video industry and also takes an active interest in the **DVD-Video** market.

Byte: 8 Bits, normally used to represent a text character or an image pixel. Early microprocessors processed only a byte of data at a time. Current microprocessors (used in personal computers and game consoles) process 64 bits (8 bytes) or more at a time.

C:

Caddy: Required to hold a CD or CD-R before it is loaded into some CD-ROM drives or CD recorders.

CAV: Constant angular velocity where the rotational speed remains constant. This mode is used in laserdics for interactive applications. (see **CLV**)

CBR: Constant Bit Rate for **MPEG-2** video encoding.

CCA: DVD Copy Control Association who administers the **CSS** copy protection for **DVD-Video** and distributes keys to licensees.

CCITT: Comité Consultatif Internationale de Telegraphique et Telephonique or Consultative Committee on International Telephone and Telegraphy, now known as the ITU-T (International Telecommunications Union - Telecommunication Standardisation Sector). It is the primary international

body for fostering co-operative standards for telecommunications equipment and systems.

CD: Abbreviation for Compact disc.

CD TEXT: A recent addition to the CD audio specification allowing disc and track related information to be added to standard audio CDs for playback on suitably equipped CD audio players. The CD TEXT information, coded as characters for maximum efficiency, is contained in the R to W subcode channels in the lead-in and/or program area of a CD. CD TEXT is compatible with the **ITTS** (Interactive Text Transmission System) standard. CD TEXT equipped players can provide a range of display formats from one or two line, 20 character display to 21 lines of 40 colour alphanumeric or graphics characters. The specification also allows for the future addition of additional data such as **JPEG** coded images.

CD-EXTRA: New name for Enhanced Music CDs, which are multisession CDs comprising a CD Audio session (with up to 98 tracks) followed by a single-track CD-ROM XA session, which contains the data. CD-EXTRA discs are compatible with all CD audio players (as the data session is not seen) and the data track can be played in a Windows 95 or 98 PC and/or a Macintosh depending on how the software was written.

CD-G/CD-Graphics: CD Graphics using the **subcode channels** on an audio CD.

CD-i: Compact Disc interactive (CD-i), a multimedia standard introduced by Philips in 1987. The standard covers both disc and player. Approximately 1m CD-i players have been sold worldwide, but, now only used for some education and training applications.

CD-i Bridge: A bridge standard allowing **CD-ROM XA** discs to play on CD-i.

CD-i Ready: CDs that can be played on audio players (audio only) and CD-i players (CD-i data & audio)

CD-R, CD-Recordables: Recordable CD used where small quantities are required. CD-Rs allow data to be written either once only or in sessions for a **multisession** disc. This allows the data to be updated and/or added to until the disc is full. The data on a CD-R disc cannot be erased or re-written, hence their alternative name **WORM** (Write Once Read Many) disc.

CD-ROM: Compact Disc Read Only Memory, a compact disc used for storing computer data and for multimedia and games applications. Data is stored in sectors of 2048 bytes. The CD-ROM specification is contained in the **Yellow Book**.

CD-ROM XA, CD-XA: Compact Disc Read Only Memory Extended Architecture, a version of CD-ROM disc where data is stored in **sectors** of 2048 bytes (with error correction) or 2324 bytes (without error correction). Sectors also include a **subheader**, which contains information to describe the contents of the sector. **CD-I, Video CD, Photo CD** and **CD EXTRA** discs are based on the CD-ROM XA specification. The CD-ROM XA specification is contained in an extension to the **Yellow Book**.

CD-RTOS: Compact Disc - Real Time Operating System for **CD-i** Players.

CD-RW: CD-ReWritable disc, which can be written to and re-written a large number of times.

CD-Video/CD-V: Compact Disc - Video; CD audio with analogue video. This format was launched on the market in 1988 but has not been successful. CD-V discs should not be confused with **Video CDs**, which contain up to 74 minutes of digital video on a compact disc.

CD-XA: See **CD-ROM XA**.

CDDA: Compact Disc Digital Audio, defined in the **Red Book**.

CEMA: Consumer Electronics Manufacturers Association.

CGMS: Copy Generation Management System, a method for controlling copying of CDs and DVDs. It can be used, for example, to prevent copies being made from a copy.

Chapter: Subdivisions of a video title (eg movie) on a **DVD-Video** disc, each chapter being a scene or other section as defined during authoring.

Chroma, Chrominance: The colour portion of the video signal that includes colour information. The luminance or intensity information is coded in a separate part of the signal. The decoder will combine the colour and intensity information and create the red, green and blue signals that are needed to define the picture to be displayed.

CIRC: Cross Interleaved Read-Solomon Code used on every **CD** for error correction.

CLV: Constant Linear Velocity, ie a constant speed in metres/second used for reading the data on **CDs**. This contrasts with constant Angular Velocity (**CAV**) where the rotation speed is constant. **Laserdiscs** can be either CLV or CAV, but CLV versions have longer playing times than CAV discs.

CMF: Cutting Master Format, which is a protocol, similar to **DDP**, that describes data that will be recorded onto an optical disc and allows the use of **DVD-R for Authoring** media instead of the more usual **DLT**. A single DVD-R disc can therefore serve as both a **check disc** for testing and for input to **glass mastering**. The CMF is written to the **lead-in** area. Titles that require **CSS** encryption, **CGMS** or region coding cannot currently be used with CMF.

CMYK: Cyan-Magenta-Yellow-Black (colour model for colour printing)

Codec: Coder/decoder; device or software that encodes and decodes digital information.

Colour Palette: A table of colour values used to reduce the data per pixel for encoding graphics images. For example a palette of 256 colours can be programmed to any set of 256 colours from, say, a total of 16 million and therefore each pixel is represented by only 8 bits.

Component Video: A method for coding video signals as three separate components, normally **YUV** or **RGB**.

Composite Video: A video format that combines **chrominance** (colour), **luminance** (brightness) and blanking in one signal, rather than the component parts.

Compression: The conversion of data to a more compact form for storage or transmission. Compression can be lossy (used where there is redundant information in the original data) or lossless (where the original data can be recovered in its entirety).

Copy Protection: A technique used on CD and DVD discs to prevent the contents being copied and/or re-used. Technologies used include watermarking, signatures on disc and encryption.

CPPM: Content Copy Protection for Pre-recorded Media, developed by the 4C consortium comprising IBM, Intel, Matsushita and Toshiba. CPPM is the digital copy protection system used for **DVD-Audio** discs and provides more protection than **CSS** does for DVD-Video. For example it allows a hacked playback device to be revoked through the use of a Media Key Block (**MKB**) containing a different key for every model of playback device instead of a single key.

CPRM: Content Copy Protection for Recordable Media, developed by the 4C consortium comprising IBM, Intel, Matsushita and Toshiba. CPRM was developed for recordable DVD discs and ensures that DVD discs cannot be copied unless it is permitted by the content owner. In particular a first generation copy cannot be further copied. It uses some of the methods used for **CPPM**, but each individual disc is uniquely identified.

CPTWG: The Copy Protection Technical Working Group, an unofficial industry panel defining copy protection techniques for the **DVD Forum**.

CRC: Cyclic Redundancy Check used to check whether a data stream has suffered any corruption producing errors.

CSS: Content Scrambling System, used for digital copy protection of DVD-Video discs. CSS involves scrambling the video and audio data using keys, which are stored in encrypted form on the disc. CSS scrambling is normally carried out during **glass mastering**.

CYMK: Cyan-Yellow-Magenta-Black (colour model for printing)

D:

D/A: Digital to Analogue

D-characters: The character set used in ISO 9660 filenames, consisting of 'A' to 'Z', '0' to '9', and '_'.

DA-88 & DA-98: Tascam 8-channel digital audio tape drive used for storing multi-channel audio for **DVD**.

DAC: Digital to Analogue Converter

DAO: See **Disc At Once** recording.

DAT: Digital Audio Tape, used to record audio in digital form at sampling rates from 32kb/s to 48kb/s. Can be used to master compact discs from. A data version (**DDS**) is also available.

DataPlay: A new optical disc format comprising a 32 mm diameter disc in a caddy that can hold 250 MB of data per side and will be available by the end of 2001 in pre-recordable and recordable versions for music, digital cameras and many more applications. The pre-recorded music versions will include copy protection. (See www.dataplay.com)

Data Fork: The part of a Macintosh HFS file containing the actual data.

DCT: Discrete Cosine Transform used in intra-encoding **JPEG** and **MPEG** frames. DCT coding encodes a block of 8 x 8 pixels at a time transforming the pixels from the spatial domain to the frequency domain.

DDCD: Double Density CD, a new version of the CD specification offering nearly twice the capacity of a standard CD by reducing the pit length and track pitch and making the modulation and error correction more efficient.

DDP: Disc Description Protocol, a standard for files accompanying **CD** and **DVD** data for **glass mastering**, which identifies and describes collections of data that will be recorded onto a compact disc (CD) or digital versatile disc (DVD). DDP allows for automated transfer of data from data publishers to disc manufacturers. DDP is the de facto standard in the DVD industry for delivering disc image data to the replication plant for manufacturing. (See www.dcainc.com).

DDS: Version of DAT used for storing computer data. Four types (DDS1, DDS2, DDS3 and DDS4) exist.

Decompression: To convert a compressed file or signal back into the original data before it was compressed.

Delta Frame: Also called Difference Frame in a compressed digital video sequence. Contains only the pixels different from the preceding frame.

Digital encoding: Conversion of each sample of a waveform to a number.

DirectShow: Part of Microsoft's new 32-bit API (**DirectX**) with provision for playing DVD-Video VOB files, ie containing MPEG-2 video, audio and navigation. DirectShow was called ActiveMovie and replaces **MCI**.

Disc: With a 'c' refers to CD, **DVD**, **MiniDiscs** and **Laserdiscs**.

Disc At Once: Refers to the ability of certain CD-Recorders to record a **CD-R** or **CD-RW** disc in one continuous operation. This is necessary to avoid glitches when playing recordable audio discs. (cf **Track at Once**).

Disk: With a 'k' refers to magnetic and magneto-optical disks (except **MiniDisc**).

Dithering: The action of smoothing an image for example to smooth the transition between two areas of different colours by adding a grainy effect.

DIVX: An alternative but discontinued **DVD-Video** format from Digital Video Express and Circuit City allowing discs to be rented, then thrown away or kept. By using extra layers of encryption the discs become unplayable after 48 hours, but this could be extended at any time by making a financial transaction via a modem built into the DIVX player. DIVX players will also play normal DVD-Video discs and were launched in the USA in mid 1998. DVD-Video players will not play DIVX discs.

DLT: Digital Linear Tape, the tape format used to transfer pre-mastered DVD data for glass mastering.

Dolby Digital: Formerly called Dolby AC-3, is the 5.1 channel surround sound audio compression format developed by Dolby and used on DVD-Video discs.

Down-mix: The conversion of multi-channel audio to, for example, stereo audio. The DVD-Audio specification allows coefficients to be stored on disc to ensure that down-mixing results in the best quality stereo output.

DSD: Direct Stream Digital, an audio encoding format developed by Sony and Philips for **Super Audio CD**, their proposed DVD-Audio format.

DSP: Digital Signal Processor, a programmable integrated circuit for carrying out fast processing of a range of tasks such as audio or video decoding.

DTLA: Digital Transmission Licensing Administrator for protecting content on DVD discs etc.

DTS: Digital Theater System, the multi-channel audio coding used in cinemas and also on some **DVD-Video** discs.

DVD: New high capacity 'compact' disc. Originally Digital Video Disc then Digital Versatile Disc but officially is just DVD.

DVD-10: A double-sided pre-recorded DVD disc format, with a capacity of 9.4 GB.

DVD-14: A double-sided pre-recorded DVD disc format, with one dual layer side and one single layer side offering a capacity of 13.2 GB, yet to become available commercially.

DVD-18: A double-sided, dual layer pre-recorded DVD disc format, with a capacity of 17.1 GB, currently used for a very small percentage of discs available.

DVD-5: A single-sided, single layer pre-recorded DVD disc format, with a capacity of 4.7 GB.

DVD-9: A single-sided, dual layer pre-recorded DVD disc format, with a capacity of 8.5 GB.

DVD-Audio: A pre-recorded DVD format intended to carry high quality audio data plus optional images, text, video and menus. The format was defined in 1999 and players and discs appeared from late 2000. (See www.dvd-audio.co.uk for more information.)

DVD Committee: A UK committee comprising studios, hardware manufacturers, authoring studios and replicators set up by the **BVA** to promote the **DVD-Video** format in the UK. It has now added the DVD-Audio format to its remit.

DVD Entertainment Group: Formerly called the DVD-Video group, this US-based organisation's mission is to market and promote consumer awareness of the benefits of DVD-Video, DVD-Audio and DVD-ROM based games, and to provide updated information to the media and the retail trade about DVD-Video and DVD-Audio players, movies and music videos. (See www.dvdinformation.com)

DVD Forum: The organisation that comprises the ten original DVD Consortium companies who developed the DVD formats plus other companies involved in DVD. There are now over 230 members. The original 10 member Steering Committee has been increased to 17. More information is available from their website, www.dvdforum.org.

DVD-Multi: A new initiative actively supported by the DVD Forum aimed at improving interoperability so that any DVD disc can play on any DVD-Multi compliant player. However this does not necessarily imply that individual files can be interpreted or played by the player.

DVD-ROM: The basic pre-recorded DVD disc, which supports DVD-Audio and DVD-Video formats. Also used to describe other DVD formats not defined in the DVD specifications including PC/Mac applications and DVD based games consoles etc.

DVD-R: A recordable write-once DVD format, with a capacity of 3.95 GB (first generation) or 4.7GB per side. There are two versions, *Authoring* version with no copy protection and *General* version (for consumer use) with copy

protection (**CPRM**) and no **CSS** capability (which mean these discs cannot be used to copy CSS protected discs).

DVD-RAM: A re-writable DVD, with capacities of 2.6 GB (first generation) or 4.7 GB (second generation) per side.

DVD-RW: A re-writable DVD with a capacity of 4.7 GB per side. The DVD-RW is an alternative to the **DVD-RAM**, which supports fewer re-write cycles than DVD-RAM but is claimed to be more compatible with **DVD-ROM** drives.

DVD+R: A recordable write-once format, developed by Philips and Sony but not recognised by the **DVD Forum**.

DVD+RW: A re-writable 12 cm optical disc with a capacity of 4.7GB per side developed by Philips and Pioneer as an alternative to DVD-RAM. It is claimed to offer almost total compatibility with existing players, but is not an official DVD format.

DVD-Video: A pre-recorded DVD format capable of carrying 133 minutes of high quality video (on a **DVD-5**) with multi-channel audio in up to 3 languages plus subtitles and menus to provide user interactivity. Other features include multiple camera angles, parental lock and random access.

DVDA: DVD Association, formed in June 1999 by the IDMA as a sister organisation. The DVDA is international in scope serving a membership that spans from North America, to Europe and Asia. Their website is **www.dvda.org**. The European DVDA was established in May 2000 and Disctronics is a Board member.

E:

E22: Measurement of uncorrectable errors used in QA measurements of a CD.

E32: Measurement of uncorrectable errors used in QA measurements of a CD.

ECC: Error Correction Code. CDs use **CIRC**, DVD discs use **RSPC**.

Eccentricity: Measurement of the positional accuracy of the centre hole on a CD.

ECMA: European Computer Manufacturers Association.

EDC: Error detection code, used within **CD** and **DVD** sectors to detect errors, which are then corrected using the **ECC**.

EFM: Eight to Fourteen Modulation used on every CD for modulation and error correction. Each 8-bit byte is represented on disc by 14 bits plus 3 padding bits, making 17 bits (symbols) in all. The purpose of EFM is to keep the number of contiguous 0s or 1s to within 3 and 11 for a CD disc.

EFMplus: A more efficient version of the modulation scheme used on CDs that is used for every DVD disc. Each 8-bit byte is represented on disc by 16 bits. The purpose of EFMplus is to keep the number of contiguous 0s or 1s to within 3 and 14 for a DVD disc.

EIA: Electronic Industries Alliance, representing the US electronics industries.

Electroforming: A process eg for depositing nickel ions on a metal surface used to make stampers for CD and DVD manufacture.

ELSPA: The European Leisure Software Publishers Association, which works to promote the interests of all its members as well as addressing issues that affect the industry as a whole.

Encryption: Transformation of data to be transmitted or stored on optical or magnetic media to ensure that only the intended recipients can make use of the information.

Enhanced Music CD: **CD EXTRA** specification for audio and data contained in separate sessions.

Exabyte: A digital tape format based on 8mm videotape and used for transferring **CD-ROM** files for mastering and for backup purposes.

F:

FACT: Federation Against Copyright Theft, an investigative organisation funded by its members to combat video counterfeiting.

FAST: The Federation Against Software Theft, created in 1984 by the software industry to lobby the UK Parliament for changes to the copyright law. FAST works on behalf of the software industry and also alongside companies who require advice and guidance to achieve a legally sustainable software environment.

Father: A nickel disc that has been electroformed from the glass master. Fathers are used in the process of making stampers for manufacturing CDs and DVDs.

Field: One-half of an interlaced video frame, consisting of every other scan line.

File system: Additional data added to a **CD-ROM** or **DVD** disc that defines the directory and file structure on the disc plus other information about the contents of the disc. A file system is necessary for all data storage media to allow data files to be accessed. File systems in use include **ISO 9660** and **UDF**.

FMD: Fluorescent Multi-layer Disc, a new optical disc technology which comprises a large number (theoretically 100 layers are possible) of fluorescent layers to store large amounts of data. The fluorescent material emits radiation when excited by an external light source. The first application of this new technology is for digital cinema, which requires large storage capacity to hold high definition movies for cinema projection. (See www.c-3d.net)

Forward motion vector: A motion vector that is used for motion compensation (in an MPEG digital video data stream) from a reference picture at an earlier time in display order

FPS: Frames Per Second. Film is 24 FPS, NTSC is 29.97 FPS and PAL/SECAM is 25 FPS.

Fractals: One method for defining graphics by translating natural curves of an object into mathematical formulas, from which the image can later be constructed.

Frame: A single, complete picture in video or film recording.

Frame rate: The number of frames displayed per second for film and video, ie FPS.

Fulfilment: Specialist printing, packaging, secure warehousing and logistics services that complement **CD** and **DVD** manufacturing to meet the ever demanding needs of customers.

G:

Gamma: Gamma is the transfer characteristic or relationship eg between the input video signal and output display, needed to compensate for non-linearities in the display's or eye's response.

GIF: Graphics Interchange Format used by CompuServe and the World Wide Web for 8-bit (256 colour) graphics images.

Glass Mastering: Part of the CD and DVD disc manufacturing process that uses a laser (which is modulated by the data to be stored on the disc) to expose areas of a photo-resist layer on a glass disc, where the final **pits** are required. These areas are then developed and the photo resist layer metallised so that stampers can be grown by electroforming using this metal layer. The stampers are then used for moulding CD and DVD discs.

Green Book: Specification from Philips & Sony defining the CD-interactive (**CD-i**) standard.

Group: Every side of a DVD-Audio disc (also called an **Album**) can contain up to 9 Groups, each of which can be subdivided into up to 99 **Tracks**.

GUI: Graphical User Interface. A software application that lies on top of other applications and provides a user interface based on graphical icons.

H:

HDCD: High Definition Compatible Digital, an enhanced version of PCM encoding that improves the quality of audio on a **CD** when using a HDCD player but does not impair the quality when playing on a normal CD player. HDCD uses the least significant bit of each sample to provide additional information to increase the number of bits per sample from 16 to 20.

HDTV: High Definition Television, offering better pictures with more lines.

Header: The bytes in a **CD-ROM** sector that contain the time-code and mode.

HFS: Macintosh's Hierarchical Filing System, which is needed on Mac CD-ROMs instead of (or in addition to) **ISO 9660**.

High Sierra Format: A standard format for placing files and directories on CD-ROM, revised and adopted by the International Standards Organisation as **ISO 9660**.

Hotspots: Areas (usually rectangle) within a graphic or other image which when selected using a mouse or other user input device results in an action being performed. Hotspots are used in computers, multimedia applications, **Video CDs** and **DVD-Videos** for menus allowing interactivity.

HQ-VCD: Renamed Super Video CD (**SVCD**). A new higher quality version of Video CD that incorporates **MPEG-2** encoding and partly matches **DVD-Video** except for playing time.

Huffman Coding: For a given character distribution, by assigning short codes to frequently occurring characters and longer codes to infrequently occurring

characters, Huffman's minimum redundancy encoding minimises the average number of bytes required to represent the characters in a text.

Hybrid: The use of two file systems (usually **ISO 9660** and **HFS**) on a single **CD-ROM**. The file system data, ie Volume Descriptors etc, occupy different areas on the disc. Hybrid discs are designed to be used on two different computer systems eg PC and Macintosh. The disc will contain common data, accessible by both file systems and data unique to only one system.

Hz: Abbreviation for Hertz; cycles per second.

I :

I3: Signals used in QA measurements of a **CD** or **DVD**, representing the signal from the shortest pit.

I11: Signals used in QA measurements of a **CD**, representing the signal from the longest pit.

I14: Signals used in QA measurements of a **DVD** disc, representing the signal from the longest pit.

I-Frame: Intra-coded frame of an **MPEG** sequence is a picture coded using information only from itself and not from preceding frames.

ICDIA: Interactive Compact Disc Association, representing **CD-I** developers.

ID: Inside Diameter, eg of a **CD** or the print area of a CD.

IDMA: The Interactive Digital Media Association, formed by the **ICDIA** to represent developers in the interactive digital media industry (but now called the DVD Association - **DVDA**).

IEEE: The Institute of Electrical and Electronics Engineers (IEEE) is the world's largest technical professional society.

IFPI: International Federation of the Phonographic Industry, which represents over 1,000 record producers worldwide and was founded over 60 years ago to protect the interests of the recording industry worldwide. IFPI introduced the **SID Code** to identify where a CD has been mastered and replicated.

Image Pacs: Group of encoded versions of the same photographic image at different resolutions according to the **Photo CD** specification.

Image Resolution: The fineness or coarseness of an image measured in pixels per line, for display, or Dots Per Inch (DPI), for print applications.

Indexes: Sub-divisions of each track of a **CD** or **DVD-Audio**. Each track may, if necessary, be divided into up to 99 indexes to provide more than 99 'tracks' per disc.

Injection Moulding: A manufacturing process in which molten plastic (eg polycarbonate for **CD** and **DVD** discs) is 'injected' into a mould under pressure. The plastic fills the cavity and, after cooling, a perfect replica is created.

Interactive Video: The combination of video and computer technology offering user interaction for training and other applications.

Interframe Coding: Compression techniques used for **MPEG** coding that code the differences between frames of video.

Interlace: Scheme to display a video image by displaying alternate scan lines in two discrete fields.

Interpolation: The process of averaging pixel information when scaling an image.

Intra coding: Coding of a **macroblock** (see **MPEG**) or picture that uses information only from that macroblock or picture.

IRMA: International Recording Media Association, previously known as the International Tape Association (ITA), which represents the optical disc and magnetic tape industries. Their website is www.recordingmedia.org.

ISC: International Steering Committee, comprising the six major international music companies plus the **RIAA**, **RIAJ** and **IFPI**. The ISC has set the requirements for **DVD-Audio** and is very involved in the development of the standard.

ISO: International Standardisation Organisation. A worldwide group responsible for establishing and managing various standards committees and expert groups, including several image compression standards.

ISO-10149: ISO version of the **Yellow Book** CD-ROM specification.

ISO 10646: ISO standard for the encoding of characters from all languages into a single 32-bit code space (Universal Character Set).

ISO 11172: ISO MPEG standard for encoding video. **MPEG** (Moving Picture Experts Group) is the ISO committee that is responsible for defining the various **MPEG** video specifications. **MPEG-1**, originally defined in 1992, was aimed at full screen video stored on a **CD-ROM**. It has since been incorporated into the **Video CD** specification.

ISO 13818: ISO MPEG-2 standard for digital television applications and is used for DVD-Video. **MPEG-2** is intended for interlaced video applications and also supports high definition video.

ISO 9002: ISO standard for quality, including manufacturing. Disctronics UK received ISO 9002 accreditation in 1998 and Disctronics France in 2000.

ISO 9660: ISO standard for **CD-ROM** file system, particularly for PC applications.

ISRC: International Standard Recording Code, for uniquely labelling audio and audio/visual recordings. The appropriate unique ISRC should be included on every track of an audio CD.

ITTS: Interactive Text Transmission System standard, used for **CD Text**.

J:

Jewel Case: A plastic case commonly used for **CDs** and **CD-ROMs**, containing the CD plus booklet.

Jitter: On a **CD** or **DVD** disc defines the percentage change in pit length compared with its nominal value. If jitter is too high, pits can be incorrectly read leading to data errors.

Joliet: Microsoft's extension to the **ISO 9660** file system to handle long filenames which are part of the features of Windows 95.

JPEG: **ISO/CCITT** Joint Photographic Experts Group, which has defined a high-quality compression standard for still pictures using a DCT algorithm.

L:

Lacquering: All CDs after metallising are protected with a lacquer by spin coating.

LASER: Light Amplification by Stimulated Emission of Radiation; a means of generating coherent light which can be focussed to a very small spot size and ideal for reading compact discs, in laser beam recording and for writing **CD-R** discs.

Layer 0: The lower, semi-reflective layer of a dual layer (**DVD-9**) disc.

Layer 1: The upper, fully reflective layer of a dual layer (**DVD-9**) disc. Layer 1 can be **Parallel Track Path** (which starts at the ID) or **Opposite Track Path** (which starts above where the Layer 0 program area ends) to allow seamless playing from Layer 0 to Layer 1.

LBR: Laser Beam Recorder used in glass mastering **CD** and **DVD discs**. A glass master disc, covered with a thin photo-resist coating is exposed by the laser in a laser beam recorder where pits will be formed in the final discs. The photo-resist is then developed and metallised with Nickel. **Stampers** used in the moulding of CDs and DVDs are then **electroformed** from the metallised glass master, which can then be recycled and re-used.

Lead-in: The starting area of a CD or DVD or of each session of a **multisession** CD. For a CD it contains the Table of Contents (**TOC**). For a DVD it contains information describing the contents of the disc and the type of disc.

Lead-out: The last area of a CD or session of a **multisession** disc or a **DVD**, immediately after the **program area**.

Letter-box: A method for displaying wide screen video on a conventional TV by adding black bars to the top and bottom so that the full width of the image is seen.

LFE: Low Frequency Effects channel eg as contained in the .1 channel of 5.1 **Dolby Digital** surround sound audio on a **DVD-Video** disc.

Locales: The name for regions of the world defined in the DVD-Video specification. Six regions are defined including 1: N America; 2: Europe and Japan; 3: Australia, South Africa etc

Lossless Compression: A data compression process that ensures that the original data is exactly recoverable. An example is **MLP** compression for **DVD-Audio**.

Lossy Compression: A data compression process in which the original data is not completely recoverable. For video or audio compression the lost data is usually either redundant or does not significantly impair the result. **MPEG-2** is a lossy compression system.

LPCM: Linear PCM, one of the audio coding formats for **DVD-Video**.

Luminance: The intensity of a video signal usually represented by the letter Y. The other signals are U & V (colour difference).

M:

M-UDF: Micro-UDF, a subset of the **UDF** file system.

Macroblock: For **JPEG** and **MPEG** pictures are divided into 16 x 16 pixel macroblocks each comprising four 8 x 8 pixel blocks. For MPEG-1 used for Video CD, there are up to 396 macroblocks per frame or picture.

Macrovision: Name of the company who developed analogue copy protection systems to prevent recording to VHS. A variant is used to prevent copying of **DVD-Video** discs. Macrovision also offer **Safedisc** copy protection for **CD-ROM** and **SafeAudio** for **CD Audio**.

Magneto-Optical (MO) discs: A re-writable optical disc, which uses a laser together with a magnetic field to change the magnetic properties of the disc on a bit by bit basis. A laser is used to read the bits.

MCI: Multimedia Control Interface, Microsoft's API for controlling multimedia devices now replaced by the 32-bit **DirectShow**.

MCPS: Mechanical Copyright Protection Society, which licenses the recording and use of music on behalf of its songwriter, composer and publisher members.

MD: MiniDisc, the 6cm magneto-optical re-writable disc format developed by Sony for audio and data storage. MiniDiscs can store 74 minutes of compressed stereo audio.

Micron: One millionth of a metre.

Middle Area: This defines two areas on a **DVD-9** dual layer disc.

1. The area after the **program area** of **Layer 0**, where the data (eg video) continues on **Layer 1**.
2. The area before the program area of **Layer 1** (which must be **Opposite Track Path**) of the same disc.

MIDI: Musical Instrument Digital Interface, an industry-standard interface used on electronic musical keyboards and PCs for computer control of musical instruments and devices.

MiniDisc: see **MD**

Mixed mode disc: A CD that comprises tracks of two or more different types, eg one or more data tracks followed by one or more audio tracks. Various options are available to implement audio and data on the same disc, including **CD EXTRA**.

MKB: Media Key Block, used in **CPPM** and **CPRM** copy protection for DVD-Audio and DVD recordable discs.

MLP: Meridian Lossless Packing, a lossless compression algorithm used in the **DVD-Audio** specification to increase the playing time. MLP offers a compression of between 2 and 3 to 1 depending on the audio content. The result is a playing time for multi-channel audio at the highest quality levels (96kHz and 24 bits) of well over 74 minutes using MLP.

MMCD: Multimedia CD, the Philips & Sony high-density disc format now replaced by **DVD**.

MMVF: Multimedia Video Format, a **DVD**-like format being developed for home digital video recording as a replacement for the VHS.

MO: Magneto-Optical discs. A re-writable optical disc, which uses a laser to change the magnetic properties of the disc on a bit by bit basis. A laser is used to read the bits.

Mode 1: CD-ROM sectors containing 2048 bytes of data per sector plus error correction.

Mode 2: CD-ROM XA sectors, which can be either Form 1 (2048 bytes + error correction) or Form 2 (2324 bytes, no error correction).

Mother: A nickel 'disc' that has been electroformed from a nickel Father as part of the **CD** or **DVD** glass mastering process.

Motion estimation: The process of estimating motion vectors during **MPEG** encoding. This avoids the need to repeat image data for an object within a video sequence by coding the movement of the object in subsequent frames.

Motion vector: A two-dimensional vector used for **MPEG** motion compensation that provides an offset from the co-ordinate position in the current picture to the co-ordinates in a reference picture.

MP@ML: Main Profile at Main Level, the **MPEG-2** profile used by **DVD-Video** for standard TV quality.

MP@HL: Main Profile at High Level, the **MPEG-2** profile used for **HDTV**.

MP3: MPEG-1 layer 3 audio encoding, used to compress audio on **CD-ROMs** and for downloading via the Internet.

MPAA: Motion Picture Association of America, the voice and advocate of the American motion picture industry.

MPEG: ISO/CCITT Moving Pictures Expert Group JTC1/SC29/WG11. This group has defined **MPEG-1**, **MPEG-2** and **MPEG-4** video compression standards.

MPEG LA: The MPEG licensing authority, responsible for collecting royalties on hardware, software and discs, which use the **MPEG-2** technology.

MPEG-1: ISO Moving Pictures Expert Group standard 11172, designed for **CD-ROM** applications.

MPEG-2: ISO Moving Pictures Expert Group standard 13818, designed for broadcast TV applications.

MPEG-4: ISO Moving Pictures Expert Group standard designed for low bandwidth applications via ISDN.

MPG: Music Producers Guild, an independent and professional organisation that promotes and represents all individuals in the music production and recording professions in the UK. MPG membership includes producers, engineers, mixers, re-mixers, programmers, students and trainees, those involved in multimedia and any other individuals involved in the creative process. (See www.mpg.org.uk.)

MultiRead: A new optical storage hardware specification adopted by **OSTA**, which defines the requirements that must be met in order for a drive to play or read **CD**, **CD-R**, **CD-RW** and **DVD** discs.

Multisession: **CD** which comprises more than one session, each of which comprises Lead-in, Program area and Lead-out and (for a recordable CD) can be written at different times (ie sessions).

Multimedia: Refers to the delivery of information that combines different content formats (motion video, audio, still images, graphics, animation, text, etc).

Musicam: An acronym for **M**asking pattern adapted **U**niversal **S**ubband **I**ntegrated **C**oding **A**nd **M**ultiplexing, a digital audio compression system selected as Layer II of the **MPEG-1** audio standard and other audio codecs where compression is achieved by exploiting the way the human ear hears different sounds and the way one sound can mask another.

N:

NTSC: National Television Systems Committee of the Electronic Industries Association (EIA) that prepared the standard of specifications for the U.S., Canada, Japan, Central America, half of the Caribbean & half of South America.

O:

OD: Outside Diameter, eg of a **CD** or the print area of a **CD**.

Opposite Track Path: Layer 1 of a **DVD-9**, where the data starts above the end of data on **Layer 0** and ends at or near the ID of the disc. The **Program Area** on this type of layer is preceded by the **Middle Area**.

Orange Book: Specification from Philips & Sony defining CD-Recordable discs (**CD-R/CD-RW/CD-MO**).

OSTA: Optical Storage Technology Association, an international trade association dedicated to promoting use of writable optical technology for storing computer data and images. OSTA has over 60 Members and Associates in North America, Asia, and Europe. It also promotes UDF.

P:

P-channel: one of the **CD subcode** channels. The P-channel is used to indicate the gap between tracks on a **CD**.

P-Frame: Predictive frame of an **MPEG** sequence.

Packet Writing: A method of writing **CD-ROM** data to a **CD-R** in smaller increments than a session.

PAL: Phase Alternation Line. Video format used in most of Western Europe, Australia and other countries

Pan & Scan: A method for displaying wide screen video on a conventional TV by showing only part of the full width. The part shown is normally adjusted during the video depending on where the most important action is.

Parallel Track Path: Layer 1 of a **DVD-9**, where the data starts at the **ID** of the disc and ends near the **OD**.

Parental Lock: A means to prevent certain scenes on a **DVD-Video** disc from being seen by children.

PCA: Power Calibration Area, which is located at the beginning of a **CD-R**, for calibrating the laser power needed for writing.

PCM: Pulse Code Modulation, the most common method of encoding an analogue audio signal into a digital bit stream.

PGC: Program Chain, containing instructions in a **DVD-Video** title for controlling interactivity and the presentation of AV sequences and menus.

Phase-Change: The technology used for **CD-RW**, **DVD-RAM** and **DVD-RW** discs, whereby the phase-change material can be in either of two phases: amorphous and crystalline. One phase represents a 0 at that point, the other a 1. A laser is used to change the phase of the active material where required.

Photo CD: CD format defined by Kodak and Philips for storing photographs for display and/or subsequent printing.

Photo Resist: A light-sensitive coating (eg on a **glass master**). After exposing to light (eg using a **laser**) it can be developed so that the exposed areas are removed.

Pit Art: A method for adding labels to DVD discs by creating a hologram-like image in the blank substrate of a **DVD-5** in place of pits that would be present on a **DVD-9** or **DVD-10** disc.

Pits: The hollows in a compact disc or DVD surface defining the data they contain. Pits measure less than 0.5 microns in width and are created by injection moulding using a nickel **stamper**.

Pixels: An abbreviation for picture element. The minimum raster display element, represented as a point with a specified colour or intensity level.

Plug & play: A term used eg in computers where software or hardware will play automatically eg when a CD-ROM disc is loaded or when a device is connected to a computer via a USB port. This feature is common in CD audio and DVD-Video players, but has not always been available on computers.

PMMA: PolyMethylMethAcrylate (also known as Acrylic), a thermo-plastic material considered for **CDs** but is rather brittle and the Aluminium layer does not adhere well to its surface.

Polycarbonate: A thermo-plastic material that is used to mould **CD** and **DVD** discs. It can be injection moulded and has the necessary mechanical and optical properties.

Post-Gap: The area on a **CD** or **CD-ROM** comprising 150 sectors at the end of the track before one of a different type (ie at the end of a CD-ROM track followed by a CD-Audio track).

PQ-Encoding: An audio CD **pre-mastering** process needed to add tracks to a CD.

Pre-mastering: Process to convert the data representing audio or a CD-ROM application into the data to be stored on the CD. For PC CD-ROMs it will involve adding the **ISO 9660** file structure data. Also refers to creating a disc image for a **DVD-Video**, **DVD-Audio** or **DVD-ROM** title, where the file system is Micro **UDF**.

Prediction: The use of a predictor to provide an estimate of the data element currently being decoded, eg for **ADPCM** audio encoding. Both ADPCM and MLP use prediction for subsequent samples and then code only the difference between the predicted and actual values.

Primary Volume Descriptor: The PVD is located at sector 16 of a **CD-ROM** data session and contains the **file system** information.

Program Area: The largest area on a **CD** or **DVD** disc containing the data representing audio, video etc. On a **multisession** CD there will be one program area per session.

PSP: Pit Signal Processing, used for invisible watermarking on a **DVD** or **CD** disc to prevent copying. PSP is specified for **SACD** discs.

Pulldown: A technique (3/2 pulldown) for converting 24 fps film to 30 fps **NTSC** video by adding fields.

Purple Book: Specification from Philips & Sony for Double Density CD (**DDCD**) read-only, recordable and re-writable versions of the CD with capacity of 1.3GB.

Push/Pull: The tracking signal when the pickup laser in a CD or DVD player crosses pits in a radial direction.

Q:

Q-channel: One of the CD **subcode** channels. The Q-channel is used to give timecode addresses and, in the lead-in, the **Table of Contents**.

QA: Quality Assurance - a vital part of any manufacturing process to ensure that any defects in the process are at a minimum and that any defective product does not reach the customer.

QuickTime: Apple Computer's video environment. Quicktime video files can also be played under Windows 95/98.

R:

Random access: The process of jumping to an arbitrary point on a **CD** or **DVD** in order to read and decode data there. Unlike tape CDs and DVDs offer fast random access to any part of the data on the disc.

Raster Graphics: Images defined as a set of **pixels** or dots in a column-and-row format. Also called bit-mapped graphics.

Real-time: In computing, refers to an operating mode under which data is received and processed as fast as the data to be processed arrives. For example, decoding of an **MPEG** video stream requires real-time decoding for smooth continuous playback.

Red Book: Specification from Philips & Sony that describes the audio **CD** format and coding.

Region Coding: In the **DVD-Video** specification, the world is divided into 6 regions or locales so discs can be made to play in only one or a limited number of regions.

Resolution: The size of an image in number of lines and pixels per line.

Resource Fork: The part of a Macintosh **HFS** file containing the Macintosh resources, such as information defining the file type.

RGB: Red-Green-Blue, the three primary colours used to output video signals to a computer monitor.

RIAA: Recording Industry Association of America

RIAJ: Recording Industry Association of Japan

RLE: Run Length Encoding. Microsoft's video compression algorithm for bitmap graphics image files

Rock Ridge: Extensions to **ISO 9660** for full Unix-like filenames.

RSPC: Reed-Solomon Product Code, the error protection system used for **DVD**.

Run-In/Run-Out Blocks: These are written to a CD-R when recording in **Track At Once** mode. Two run-out blocks are written at the end of each track and five run-in blocks are written at the start of the next track.

Runlength Compression: A form of compression for image files where a run of pixels of the same colour are coded as the colour and the number of pixels in the run.

S:

SACD: See Super Audio CD.

SafeAudio: a copy protection system for **CD Audio** discs developed by Macrovision to prevent copying and piracy.

SafeDisc: a copy protection system for **CD-ROM** titles developed by C-dilla to prevent copying and piracy. It involves encrypting the data and placing a signature on the disc that cannot be copied but must be in place in order for the disc to be played.

Sampling: The first step in the process of converting an analogue signal into a digital representation. This is accomplished by measuring the value of the analogue signal at regular intervals called samples. These values are then encoded to provide a digital representation of the analogue signal

Sampling rate: The number of samples taken of a signal per unit time.

SAO: Session at once, where a complete session (Lead-in, Program and Lead-out areas) of a CD-R or CD-RW disc is written in one uninterrupted sequence.

Satellite: a loudspeaker, usually one of up to 5, which has a limited bass response to reduce its size but is used with a subwoofer to provide a full frequency range in a surround sound system.

Scanning Velocity: Velocity (speed) of a **CD** or **DVD** when being read at normal speed. This should be constant from start to finish of the disc.

Scarlet Book: The book containing the specification for **SACD**, Philips' and Sony's proposal for a next generation audio disc format.

Screen Printing: A process used for printing multi-colour labels on **CD** and **DVD** discs.

SD: Super Density Disc, Toshiba's original high-density compact disc proposal.

SDDS: Sony Dynamic Digital Sound, introduced in August 1994, for the film industry, designed to provide the best and highest quality sound presentation. SDDS is an optional audio coding format for **DVD-Video**.

SECAM: "SEquential Couleur A Memoire" (sequential colour with memory). Video format used in France, Eastern Europe and other countries.

Sectors: Units of data on a CD-ROM disc containing 2048 or 2324 bytes of data plus header information. At normal speed, 75 sectors per second are read

from a **CD-ROM**. Also the units of data on a **DVD** containing 2048 bytes of user data.

Session: An area of a **multisession** disc consisting of a **Lead-In** area, **Program** area and a **Lead-Out** area. On a **CD-R** it allows the data to be written a session at a time. Up to 99 sessions may be written to a single disc.

SHG Laser: Second Harmonic Generation laser, for creating a laser output with half the wavelength of the laser generating the light. This allows an infrared laser to be used to generate blue light for higher density optical discs.

Si: The chemical symbol for Silicon, used for the semi-reflective layer of a dual layer **DVD-9** disc as a lower cost alternative to Gold.

SID Code: A unique set of codes on Compact Discs to identify where it was manufactured. The **Mastering Code** identifies the laser beam recorder used to master the title and the **Mould Code** identifies which moulding machine was used. SID Codes were introduced by the **IFPI** in conjunction with Philips Electronics

SIF: Standard Interchange Format for video images of 240 lines with 352 pixels each for **NTSC**, and 288 lines by 352 pixels for **PAL** and **SECAM**.

SIIA: Software and Information Industry Association, which was formed on 1 Jan 1999 from the **SPA** (Software Publishing Association) and the **IIA** (Information Industry Association).

Smart Content: System Managed Audio Resource Technique, used in **DVD-Audio** discs and players to allow multi-channel audio to be down-mixed to stereo exactly as the artist/producer intended.

SMPTE: Society of Motion Picture and Television Engineers.

SMPTE Time Code: An 80-bit standardised edit time code adopted by the **SMPTE**.

SPA: Software Publishers' Association, which has joined up with the **IIA** (Information Industry Association) to become the **SIIA** (Software and Information Industry Association).

Sputtering: A process for coating moulded CDs with aluminium whereby an aluminium target is bombarded with particles causing the aluminium to be deposited on the CD surface. Sputtering is also used to deposit Gold or Silicon on the semi-reflective layer of dual layer **DVD-9** discs.

Stamper: A nickel disc created by **electroforming** from the mother and used to mould CDs and DVDs.

Subcode: A separate low speed data channel on every **CD**. The subcode comprises 8 channels. The P and Q channels are used to provide control information for CD discs. The R to W channels are used for **CD Graphics**.

Subheader: Subheader is one of the fields in a **mode 2** sector and is used to describe the contents of the sector.

Subpicture: Overlay graphics image contained in a **DVD-Video** file for subtitles, menu highlighting and other purposes.

Subwoofer: A loudspeaker designed for low frequencies to reproduce the low frequencies from the .1 channel of 5.1 channel surround sound. Also used with small satellite speakers to reproduce the non-directional low frequencies.

Super Audio CD: An alternative to the **DVD-Audio** format developed by Philips and Sony. It is designed to play on audio CD players and Super Audio CD players by comprising two layers: one with CD-Audio the other with high quality audio. The audio encoding used is Direct Stream Digital (**DSD**).

Super Video CD (SVCD): An enhanced Video CD format, which uses variable bit rate MPEG-2 encoding at a higher data rate than Video CD version 2. It also includes an additional stereo audio channel or multi-channel audio and subpictures. SVCD offers video quality and features closer to DVD-Video, although a full-length movie will require three discs.

Surround sound: Multi-channel audio providing a two-dimensional sound resulting from the use of loudspeakers at the front and rear. A typical example is 5.1 channels (used in **DVD-Video** titles) comprising three front and two rear channels plus a low frequency effects channel.

SVCD: See **Super Video CD**.

T:

Table of Contents: Table of Contents of a CD, listing the start time code of every track on the disc and contained in the **subcode** (Q-channel) in the **Lead In** area.

TAO: see Track At Once.

TCG: The **DVD Forum's** Technical Co-ordination Group, which comprises the 17 Steering Committee member companies and to which all the eight working groups report. The TCG also submits technical proposals to the Steering Committee.

Tilt: A measure of warping or dishing of an optical disc. Tilt is of particular importance for **DVD** discs.

Time Code: A frame-by-frame address code time reference recorded on the spare track of videotape or inserted in the vertical blanking interval. It is an eight-digit number encoding time in hours, minutes, seconds, and video frames (e.g.: 02:04:48:16).

TOC: Table of Contents of **CD**, listing the start time code of every **track** on the disc.

Track At Once: Refers to the way some CD-Recorders write **CD-R** or **CD-RW** discs, where a track (with post-gap) is written in one action, but then waits before the next track is written. Each time the laser is stopped, it writes Run-Out blocks. When re-starting, it writes Run-In blocks (a total of 7 blocks). This can cause a glitch when playing audio CDs recorded in this way, so other CD-Recorders use Disc at Once (**DAO**) recording.

Track Pitch: The distance between consecutive 'tracks' on a CD or DVD disc measured in a radial direction.

Tracks: Sub-divisions of the program area of a **CD**. Each disc may have up to 99 tracks each at least 4 seconds in length. Each track can contain data of only one type. Also refers to the sub-divisions of the audio on a **DVD-Audio** disc, which may comprise up to 9 **Groups** each consisting of up to 99 tracks.

TWG: Technical Working Group, which defined the original requirements and specifications for **DVD-ROM**.

U:

UDF: Universal Disk Format, the file system used for **DVD** and MO disks.

Unix: A multi-tasking operating system used in Sun workstations and other computer systems.

UPC: Universal Product Code, a 13-digit catalogue number for the entire disc contained in the disc's Table of Contents.

UV: Ultra violet light, used for curing the protective lacquer on CDs, the bonding resin for **DVDs** and the inks used for printing labels on CD and DVD discs.

V:

Variable Bit Rate (VBR): Bit rate varies with time during the decoding of a compressed bitstream. One example is **MPEG-2** for **DVD-Video** where bit rate changes according to compression requirements to keep average bit rate low. VBR encoding offers better quality than constant bit rate (**CBR**) at lower data rates.

VBR: See **Variable Bit Rate**.

Video CD: The White Book standard for up to 74 minutes of VHS quality **MPEG-1** video on one **CD**.

VOB: Video Object, a file on a **DVD-Video** disc containing **MPEG** video, audio and navigation data.

Volume: According to the **ISO 9660** standard, a single **CD-ROM** disc.

Volume Descriptors: Data (at the start of the program area of a **CD-ROM** disc) containing file system information about the files and directories on the disc. **ISO 9660** and other file systems use volume descriptors.

VSC: The Video Standards Council, established in 1989 as a non-profit making body to develop and administer a Code of Practice designed to promote high standards within the video industry and, from 1993, the computer games Industry.

VTs: Video Title Set on a DVD-Video disc. There can be one or more titles per **DVD-Video** disc.

W:

WAV: File extension for PCM Wave audio files.

WG1: DVD Forum working group that developed the **DVD-Video** specification, now studying video recording and HDTV

WG2: DVD Forum working group that developed the **DVD-ROM** specification.

WG3: DVD Forum working group that created the **File system** specification for DVD

WG4: DVD Forum working group that has been developing the **DVD-Audio** specification.

WG5: DVD Forum working group that is developing the **DVD-RAM** specification.

WG6: DVD Forum working group that is developing the **DVD-R/RW** specification.

WG9: DVD Forum working group that is working on **copy protection**.

WG10: DVD Forum working group that is studying broadcast & professional applications of DVD.

White Book: Specification from Philips and Sony defining the **Video CD** standard for up to 74 minutes of VHS quality **MPEG-1** video on one CD.

WORM: Write Once Read Many, known as **CD-R** (CD-Recordable).

X:

XRCD: eXtended Resolution CD, developed by JVC to improve the pre-mastering of audio for CD.

Y:

Y: Common abbreviation for the luminance or luma signal.

Y/C Video: Type of video signal used in Hi8, S-VHS and some laserdisc formats. It transmits luminance and colour portions separately, using multiple wires.

Yellow Book: Specification from Philips & Sony defining the CD-ROM specification.

YUV: A colour encoding scheme for natural pictures in which luminance and chrominance are separate. The human eye is less sensitive to colour variations than to intensity variations. YUV allows the encoding of luminance (Y) information at full bandwidth and chrominance (UV) information at reduced bandwidth.

Disctronics

Disctronics is one of the largest independent CD and DVD disc manufacturers, with plants in the USA and Europe offering a total capacity of 1 million CD and 100 thousand DVD discs every day, seven days a week. The company has replication plants in the UK, France, Italy and Texas, plus sales offices in Paris and Los Angeles as well as a rapidly growing fulfilment division in the UK. We offer CD & DVD premastering, mastering, copy protection, on-line order tracking, replication, fulfilment, CD cards, custom CDs and e-commerce services for the music, software and home video industries. Disctronics is ISO 9002 registered, accredited by IRMA, ELSPA and FACT and is a founder member of IODRA.

Disctronics thrives on offering the best service to our customers. In addition to our disc replication and fulfilment services, we also provide information and advice to our customers where and when they need it. This is particularly important for new technologies such as DVD where even the most experienced are still learning.

For more information on CD, CD-ROM and other disc formats email **sales@disctronics.com** or visit our website **www.disctronics.com**.

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