PREFACE

It was summer 1973. I was preparing the shooting of my diploma project, a multi-camera television drama based on a text by Peter Brook. As a young director, I was given only two days to shoot a half-hour piece. And the days were Saturday and Sunday.

We were shooting in a small, film studio with no television facilities, so an outside broadcast van came the day before. On Saturday morning, when, full of enthusiasm, I arrived to work on my first "master-piece", the van was standing there, still not cabled to the studio.

After checking other things, I decided that it was time to talk to the OB van people. I went to the chief technician and asked him, kindly but decisively, to connect the equipment, because we were already late. He looked at me with an "ah, another greenhorn" look and disappeared into the van.

You have to know that OB van people are a special breed. The live on locations, one day doing a horse races, the next day a political rally. They have seen many directors and television editors and have a simple way to handle life –you come and go, we stay

So, I went back to checking other things and spent some time in the dressing room, talking with actors. When I came back to the studio, the cameras were set up, as was the other necessary equipment. It seemed to be in order, so I asked my assistant to call everybody because we should start working.

Well, not really. The only pictures coming from the cameras were "color-bars". Nothing else. Something was wrong.

Again, I went to see the chief technician. He was standing in the front of the van, enjoying a cigarette. When I asked him what was going on, he just gave me a look and said, "I am really sorry, but we have bad decibels. We are working on it."

Of course, I didn't know what decibels were. Nobody told me anything about them. Bergman, Godard, Brecht, Sartre – of course! But – decibels? Not part of the curriculum.

I tried to talk to him and explain that this was my diploma project, and therefore of cosmic importance. He looked at me and said, nicely and calmly, "Sorry old chap, bad decibels. There is nothing we can do at the moment".

That day, we didn't shoot a single minute. We spent all our time just blocking, rehearsing, etc. The next day, the second and last day of my precious shoot, everything was fine. There was picture on the cameras and we succeeded in shooting the whole dramatic piece. I was prepared as never before in my life.

Much later, I discovered that on that Saturday there was an important soccer game taking place. So, while I was rehearsing with the actors, the technical crew was probably locked in the OB van, watching the game and drinking beer. Working on "bad decibels" of course.

I worked with that crew and the chief technician many times after that. We became friends and laughed about the event. But I learned my lesson. Even a director has to know a lot about technology.

That is how everything started.

Now, thirty years later, I want to share with you some of the knowledge about technology I accumulated over the years. I hope you'll be able to use it.

I also want to take the opportunity to thank the people who enabled me to put this book together – the CILECT Executive Council and especially Professor Henry Breitrose who helped me a lot with his knowledge, patience and wisdom.

And, of course, my wife Vesna who tolerated the years of my late, late work in the study.

Nenad Puhovski,

Chair, Cilect Standing Committee for New Technologies

A - Frame Edit _ A video edit which starts on the first frame of the 5 video frame (4 film frame) sequence created when 24 frame film is transferred to 30 frame video. The A-frame is the only frame in the sequence where a film frame is completely reproduced on one and only one complete video frame.

A & B Roll _ **a)** *Film* - An edited master of original film material assembled into two separate rolls, one for the odd numbered shots and one for the even numbered shots, so that dissolves wipes and even supers can be overlapped and printed together, or to hide slices on a print. _ **b)** *Video* - Two submaster tapes so that dissolves or wipes can be achieved from the two sources and recorded onto a third VTR. _ **c)** *Nonlinear* - Using two source streams (*.avi*, *.wav*, *.tga*, and so on) to create an effect.

A/D Converter _ Circuit for converting analog waveforms into a series of equally spaced numerical values represented by binary numbers. All analog signals have to be digitized for subsequent use by computers The analog signal is sampled every few milliseconds and its level is quantized into a digital word. The larger the digital word (i.e. the more "bits"), the more accurate the digital representation of the analog value. For TV pictures 8 or 10 bits are normally used; for sound, 16 or 20 bits are common while 24 bits is also possible.

A/V _ The industry term for audio/visual, or audio/video.

A/V Drive _ *Audio/video drive* - a high-end hard drive capable of storing high-bandwidth (i.e., high data rate) audio/video data.

AAC _ *Advanced Audio Coding* - AAC is the audio coding standard defined by the International Organization for Standardization (ISO) as part of the MPEG-2 specification. Compared to MP3, AAC provides higher quality music with approximately 30% storage space or bandwidth. AAC provides up to 48 audio channels and sample rates up to 96 kHz. AAC is available in three profiles: Main, Low Complexity (LC) and Scaleable Sampling Rate (SSR), with Main providing the highest quality. MPEG-4 includes a superset of MPEG-2 AAC.

AAF _ *Advanced Authoring Format* - an industry initiative, launched in March 1998, to create a file interchange standard for the easy sharing of media data and metadata among digital production tools and content creation applications, regardless of platform. It is based on Aid's Open Media Framework Interchange (OMFI), with additions for EBU/SMPTE metadata and management of pluggable effects and codecs. It should allow more open connections between equipment where not only video and audio are transferred but also metadata including information on how the content is composed - an all embracing EDL.

Abandonware _ Software that is no longer sold commercially or supported. Games often fall into the abandonware category, as do many Web sites that provide links and downloads.

ABC _ *Atanasoff-Berry Computer* - The first electronic digital computer. Completed in 1942 by Iowa State Professor John Atanasoff and graduate student Clifford Berry, it employed many of the principles of all future computers. For example, although physically in the form of rotating drums, its memory used capacitors that were constantly being recharged like today's dynamic RAM. It used a standard IBM card reader for input and an odometer-like device for output. The ABC could solve 29 linear equations with 29 unknowns in one 24-hour day, a marvel for its time.

Abend _ *Abnormal End* - Also called a "crash" or "bomb," it occurs when the computer is presented with instructions or data it cannot recognize or the program is reaching beyond its protective boundary. It is the result of erroneous software logic or hardware failure. When the abend occurs, if the program is running in a personal computer under a single-task (one program at a time) operating system, such as DOS, the computer locks up and has to be rebooted. Multitasking operating systems with memory protection halt the offending program allowing remaining programs to continue.

Ablative WORM _ An optical disk technology in which the creation of the bit permanently alters the recording material, and the data cannot be changed.

Abort _ To stop a program while it is running. Aborting can be initiated by the user or by the program itself.

ABR _ stands for *Average Bitrate* and is basically just one form of Variable Bitrate where the encoder tries to maintain specific average bitrate for the file so that the actual size of the resulting file could be estimated more easily. To achieve a situation where you tell the encoder that you wish to use a specific **ABR** and that the encoder would actually do exactly that requires usage of multi-pass encoding technology. As there aren't currently any audio encoders available that can use multi-pass encoding, true respect-the-ABR-I-want-to type of encoding is possible only with video encoding. On the other hand, ABR can also simply state the average bitrate of a VBR encoded video or audio clip.

Absolute Resolution _ image resolution expressed in horizontal versus vertical pixels. (E.g. 1600x1200 Pixels is the absolute resolution, and is also expressed as 2.1 Megapixel)

Absolute URL _ The full Internet address of a page or other World Wide Web resource. The absolute URL includes a protocol, such as "http," a Network location, an optional path and a file name. Example: http://anything. youwant.com

AC - 3 _ The technical name for Dolby Digital. The "AC" stands for Audio Code and the "3" means version 3.

AC'97, AC'98 _ These are definitions by Intel for the audio I/O implementation for PCs. Two chips are defined: an analog audio I/O chip and a digital controller chip. The digital chip will eventually be replaced by a software solution. The goal is to increase the audio performance of PCs and lower cost.

Accelerator _ A device or software designed to speed up operations, such as refreshing a screen image. Many PC SVGA graphics boards come furnished with accelerator chips. There are also auxiliary boards (commonly called pass-through boards) that will boost the speed of regular VGA boards.

Acceptance Test _ A procedure defined in a hardware or software contract for testing whether the hardware or software meets its specification.

Access _ Retrieval of data from or transfer of data into a storage device or area such as RAM or a register.

Access Speed _ The rate, usually measured in milliseconds, at which data can be located on a digital storage device such as a hard disk, tape, or CD-ROM. Since the access speed depends on the current position of the reading head and the position of the requested data, the time taken to access data can vary significantly. Therefore, specifications usually refer to the average access time or speed.

Access Time _ The amount of time, including Seek time, Latency and Controller time, needed for a storage device to retrieve information. The computer industry often uses the Access Time as a benchmark (i.e. reference point) when comparing the performance of hard disks or other add-on devices. The lower the (ms) or (ns) the better the performance of the piece of equipment.

Access Unit _ A coded representation of a presentation unit. For audio, an access unit is the coded representation of an audio frame; for video, an access unit is the coded representation of a picture.

Accessibility _ The quality of a system incorporating hardware or software that makes it usable by people with one or more physical disabilities, such as restricted mobility, blindness, or deafness.

Acoustics _ The characteristics, such as how sound is reflected and absorbed, that give a space such as a living room, concert hall, or cinema an identifiable sonic "signature."

Acquire _ The opening up and importing of files into a given software application. The term is applied differently within different types of software. With imaging software it is most often done through a twain interface or plug-in mini-application.

Acquisition _ The act of capturing images that will eventually be used in a video or film production.

Action _ Action games are generally centered on just that - action. The player's character is equipped with a staggering number of weapons and ammunition and is faced with endless hordes of enemies whose bullets never seem to move quite as fast as they should. Of course, many variations on this theme exist, but the gist of the gameplay is running, jumping, and some method of attacking enemies. Occasional puzzle-solving elements exist in action games, but the focus always remains on expansive levels and action.

Active _ Describes a circuit containing transistors, ICs, tubes and other devices that require power to operate and are capable of amplification.

Active Channel _ An information delivery system from Microsoft that provides a platform for "pushing" information to users from Internet content providers as well as from internal intranets. Active Channels, which are supported starting in Internet Explorer Version 4.0 and Windows 98, are based on Microsoft's Channel Definition Format (CDF).

Active Circuit _ A circuit containing amplification. For example, an active throughput circuit on a monitor would provide amplification to compensate for the loss in voltage of the returned signal "split off" of the input for the monitor. If the active circuit is not self terminating (either by a switch to a load, or already terminated but self-sensing to pass throughput amplification), a "terminator" rated to the proper load should be used to close the circuit. A passive circuit in the same circumstances would "tap" the input voltage.

Active Data Objects _ Components that enable client applications to access and manipulate data in a file or server based database through an Internet provider.

Active Matrix TFT _ Term used to describe LCD Displays which have micro-transistors that "open" and "close" each pixel. A typical active matrix TFT display is a single panel of LCD glass that controls all three primary colors. TFT displays are noted for their quick response time and their ability to display full motion video and animations without image ghosting. A common type of LCD used in laptops, cameras, and LCD projection panels.

Active Partition _ The primary partition of the hard drive that has been set up either by the computer manufacturer or by the main user to be read and used when it boots up (i.e. starts up). It usually contains all the main system files and it's most likely on C: Drive.

Active Picture Area _ The part of a TV picture that contains actual image information as opposed to sync or other data. Vertically the active picture area is 486 lines for NTSC and 576 lines for PAL. The inactive area is called blanking.

Active Sensing _ a method by which a MIDI device detects disconnection. A message is sent to the receiver around three times per second, and if no message is received during this period, the unit assumes the MIDI connection has been broken. It then begins a routine to reestablish normal operation.

Active "X" _ A set of technologies that enable software components to interact with one another in a networked environment regardless of the language in which the components were created. Active "X" is used primarily to develop interactive content for the World Wide Web and it can also be used in other programs and desktop applications. Active "X" controls can be embedded into Web pages to produce animations or multimedia effects.

ActiveX Documents _ Extensions to Microsoft's OLE compound document architecture that allow a container application to use the full capabilities of server applications. For example, starting with Version 3.0, Internet Explorer (IE) is an ActiveX Documents container. Microsoft Office applications and the HTML viewer used in IE are ActiveX Document servers. Thus, IE can view a Web page, an Excel spreadsheet or a Word document by launching the appropriate server application. Microsoft's Binder, which is an ActiveX Documents container, can print Excel spreadsheets and Word documents with the full printing and formatting capabilities of Excel and Word. Formerly Document Objects, or DocObjects, the documents associated with ActiveX Documents are now ActiveX Documents objects.

Adaptive Caching _ A feature of hard drives that enables the drive to determine the environment in which it's being used and optimize the way it handles commands and data.

Adaptive Compression _ A type of compression software commonly used to back up files. The method of compression changes with the type of file, and is not recommended for photographic images because it may destroy original data.

ADAT _ A professional, 8-track digital audio tape recorder format. Widely used in recording studios around the world, the ADAT format is proprietary, but requires the use of S-VHS tape cartridges because of their high quality. ADAT machines have come in 16-bit (Type I) and 20-bit (Type II) models, and multiple units can be linked together via an optical fiber cable. ADAT expansion cards for PCs and Macs provide a digital audio link to ADAP recorders.

ADC (A-D, A/D, A-to-D) _ Analog to Digital Conversion. An ADC for digitizing video must be capable of sampling at 10 to 150 million samples per second (MSPS).

Additive Primary Colors _ The three additive primary colors, red, green and blue, create all other colors when working with transmitted light (such as on a computer monitor), An equal mix of all three primary colors produce white light.

Additive Synthesis _ a synthesis method that builds complex waveforms by combining sine waves whose frequencies and amplitudes are independently variable.

Add-on _ Software that is designed to enhance or expand the capabilities of other software.

Address _ **a)** the unique identifier assigned to a Web page. _ **b)** Where a piece of memory can be found. Clashes occur when two computer boards try to access the same address. _ **c)** In the hard drive industry, there are several types of addresses; an address may refer to that of a drive, called a unit address; radial position, called a Cylinder address; or circumferential position, referred to as a Sector address.

Address Bus _ An internal channel from the CPU to memory across which the addresses of data (not the data) are transmitted. The number of lines (wires) in the address bus determines the amount of memory that can be directly addressed as each line carries one bit of the address. For example, the 8088 CPU has 20 address lines and can address 1,048,576 bytes. The 68020 has 32 address lines and can address four gigabytes. Various swapping and switching techniques can be added to the hardware that allow a computer to use more memory than is directly addressable by its address bus.

Address Space _ A computer's address space is the total amount of memory that can be addressed by the computer. For example, the Pentium can address 4GB of physical memory and 64TB of virtual memory. A program's address space is the actual memory used by the program when running. It may refer to physical memory (RAM chips) or virtual memory (disk) or a combination of both.

Addressability _ A reference to the accurate placement of pixels of a digital file rendered to output devices such as film recorders and image setters. The size of the recorded pixel, the size of the imaging sensor, system illumination, and optical quality all affect addressability.

Addressable Resolution _ The maximum number of pixels an imaging device is capable of manipulating, and not necessarily the same amount the monitor is capable of displaying.

ADO _ *ActiveX Data Objects* - A programming interface from Microsoft that is designed as "the" Microsoft standard for data access. First used with Internet Information Server, ADO is a set of COM objects that provides an interface to OLE DB. The three primary objects are Connection, Command and Recordset. The Connection object establishes a connection with a particular database management system (DBMS) or other data source. It can also send a query to the database. The Command object is an alternate way of sending a query to the database, and the Recordset object contains the resulting answer, which is a group of records.

ADPCM _ *Adaptive Differential Pulse Code Modulation* - a high quality audio compression algorithm used in CD-ROM XA and CD-I standards. The compression is obtained by not storing the full sample values (16-bit) but only the difference (4-bit or 8-bit) between consecutive samples. Three quality levels are defined: Level A 8-bit per sample, Level B 4-bit per sample and Level C 4-bit per sample. Use of ADPCM provides a reduction of up to 16 times (Level C), compared to linear PCM.

ADSP _ *Advanced digital sync processing* Using sync processing to allow centering control (H-shift or V-shift) can create problems with some display devices because of the sync delay. This means the LCD projector user may have to choose between a stable sync and centering control. ADSP restores a stable sync signal, while allowing centering control.

ADSR _ *Attack, Decay, Sustain and Release* are the four stages of an envelope that describe the shape of a sound over time. This is a simple type of envelope generator and was first used on early analog synthesizers. This form of envelope generator continues to be popular on modern instruments. Attack represents the time the sound takes to rise from an initial value of zero to its maximum level. Decay is the time for the initial falling off to the sustain level. Sustain is the time during which it remains at this level. Release is the time it takes to move from the sustain to its final level. Release typically begins when a note is let up. In most sound generators, the time and the value reached are programmable.

Advanced Simple Profile _ one of the video encoding layers of MPEG-4. It is best understood as an addition to MPEG-4's Simple Profile video encoding. ASP adds the following technologies over SP, but is otherwise exactly like SP: B-frames, ¼ pel motion compensation, extra quantization tables and global motion compensation.

Advanced Television _ (ATV) The Facts name for Digital Television (DTV).

Adventure _ A relative of the action game, the adventure game contains action and puzzle solving in more balanced proportions. Where an action game centers on destroying everything in sight, an adventure game rewards exploration and interaction with non-player characters (often referred to in gaming vernacular as NPCs). Adventure games usually give the player an inventory system of some kind and may include money for purchasing additional items or, in contrast to an action game where ammo is unlimited, a system of loading and managing ammunition. Adventure games include the *Legend of Zelda* series and *Metal Gear Solid*.

AE Bracketing _ Used in Still digital cameras, auto exposure bracketing enables camera to capture the right exposure. It will take a picture in three different exposure modes, afterwards user can choose the one with the right exposure.

AES/EBU Interface _ A two-channel, digital audio hardware/software standard. The AES/EBU interface allows for data communication between professionally-oriented digital devices such as digital signal processors, hard disk recording systems, synthesizers with AES/EBU outputs, digital audio workstations, etc. The AES/EBU standards have agreed upon 32, 44.1 and 48 kHz as possible sampling frequencies. Resolution can be up to 24 bits at maximum. Studios usually use a resolution of 16 bits (in special cases 20 bits) and a sampling frequency of 48 kHz (e.g. DAT). This results in a data rate of 768 kbits/s. Standard IEC-958 defines this interface; it uses XLR type connectors.

AFC _ *Automatic Frequency Control* - A circuit that automatically keeps an oscillator on frequency. When present on a TV set, the AFC control usually applies to the TV channel tuning section. It keeps the tuner locked to the channel selected. The function of AFC can be applied to other circuits in a viewing device.

AFD _ *Active Format Description* - used in DVB Europe, descriptive format display data carried in the user data portion of the MPEG-2 video elementary stream for a 4-bit field notating the active aspect ratio format.

AFM _ Abbreviation for *audio frequency modulation*, a system for recording sound waves in HiFi quality (>16kHz); the most common form of audio recording found in most consumer and professional video recording decks, especially in VHS and 8mm recorders. AFM audio is limited in dynamic range and frequency response, and can include stereo and multi-track audio.

Aftertouch _ A means of generating a control signal based on how much pressure is applied to the keys of a MIDI keyboard. Most instruments that support this do not have independent pressure sensing for all keys, but rather detect the overall pressure by means of a sensing strip running beneath the keys. Aftertouch may be used to control such functions as vibrato depth, filter brightness, loudness and so on.

Agent _ A software routine that waits in the background and performs an action when a specified event occurs. For example, agents could transmit a summary file on the first day of the month or monitor incoming data and alert the user when a certain transaction has arrived. Agents are also called "intelligent agents," "personal agents" and "bots."

AGP _ *Accelerated Graphics Port* - A high-speed port developed by Intel that is designed for the display adapter (video card) only. It provides a direct connection between the card and the main system memory, and only one AGP slot is on the motherboard. AGP was introduced as a higher-speed alternative to the PCI-based adapter, plus it freed up a PCI slot to be used for another peripheral device. The brown AGP slot is slightly shorter than the white PCI slot and is located about an inch farther back. AGP uses a 32-bit bus. The original AGP standard (AGP 1x) provided a data transfer rate of 264 Mbytes/sec. AGP 2x is 528 Mbytes/sec. AGP 4x is 1 Gbyte/sec. AGP 8x is 2 Gbytes/sec.

AI _ _Artificial Intelligence_ _ is technology that seeks to emulate the random and complex nature of human thought and behavior rather than following a set course of stimuli and responses. The term "intelligence" refers to processing capability; therefore, every computer is intelligent, but, artificial intelligence implies human-like intelligence. An ironic twist in terminology. By 2015, you should be able to converse with the average computer. Future systems will ask you what help you need and automatically call in the appropriate applications to aid you in solving your problem. The AI buzzword has been abused to the hilt as it referred to any and all advancements. However, the acid test of AI was defined in the 1940s by the English scientist, Alan Turing, who said, "A machine has artificial intelligence when there is no discernible difference between the conversation generated by the machine and that of an intelligent person."

AIBO _ _Artificial Intelligence Robot_ - A battery-operated robotic dog from Sony that behaves like a living animal, learning and growing through experience. Capable of autonomous behavior, AIBO understands voice commands, and it simulates instincts and feelings with sound and action. In June 1999, the first batch of 3,000 AIBOs (which also means pal, or companion, in Japanese) were sold out in 20 minutes after going on sale over the Internet.

AIF _ _Audio Interchange File_ - An audio file format developed by Apple Computer to store high quality sampled sound and musical instrument information. The AIF files are a popular format for transferring between the Macintosh and the PC. AIF breaks apart the file into chunks. The Common chunk holds file parameters such as sampling rate, and the Sound Data chunk contains the digital sound. AIFC and AIFF-C are compressed versions of the format.

AIMM _ _AGP Inline Memory Module_ - A memory card that plugs into the AGP port. It augments the display memory on motherboards that already have AGP circuits built in.

Airbrush _ A digital tool which gives the effect of spraying a paint/air mixture over an image. Most graphic packages incorporate an assortment of brushes that are user definable.

ALC _ _Automatic level control_ - Also called automatic gain control (AGC) and automatic volume control (AVC). In audio recording, a circuit used to control the output level automatically, without distortion due to overload.

Algorithm _ A formula or set of steps used to simplify, modify, or predict data. An algorithm should express the information needed to perform the relevant task, the steps needed to accomplish the task, and the sequencing of these steps to complete the task reliably. Complex algorithms are used to selectively reduce the high digital audio and video data rates. These algorithms utilize physiologists' knowledge of hearing and eyesight. For example, we can resolve fine detail in a still scene, but our eye cannot resolve the same detail in a moving scene. Using knowledge of these limitations, algorithms are formulated to selectively reduce the data rate without affecting the viewing experience.

Algorithmic Composition _ A type of composition in which the large outlines of the piece, or the procedures to be used in generating it, are determined by the human composer while some of the details, such as notes or rhythms, are created by a computer program using algorithmic processes.

Alias _ literally "going under another name". In computer terms, if means making a shortcut to a program or other file, which will take you straight to that file, but leaves the original file where it is stored, so it's not being moved around enough to confuse you, or to the wrong place, or being exposed to other people fiddling with it. Aliases are very handy on the desktop, and when you want to use a different filename but don't want to, or shouldn't, alter the name of the original file.

Aliasing _ General term for disturbing effects that may be caused by sampling frequencies being too low. Aliasing occurs when smooth curves and lines become rough or jagged because of a lower resolution device, or by an event. _ **a)** In _analog video_, aliasing is typically caused by interference between the luma and chroma frequencies or between the chroma and field scanning frequencies. It appears as a moiré or herringbone pattern, straight lines that become wavy, or rainbow colors. _ **b)** In _digital video_, insufficient sampling or poor filtering of the signal causes aliasing. Defects typically appear as jagged edges on diagonal lines and twinkling or brightening in picture detail. The "steppiness" of unfiltered lines presented at an angle to the TV raster is also referred to as aliasing.

_ c) The principle of **graphical aliasing** is simple: Placing two screens upon each other can cause additional, finer patterns than those existing in one of the two screens. Such patterns can have a disturbing influence on the picture. _ **d) *Temporal aliasing*** is known from wild west movies: When a wagon crosses the picture, we oftentimes see the wheels turning backward. Reason: The rotating frequency of the spokes collides with the frequency with which the TV image repeats itself (50 Hz). _ **e)** When an **analog audio signal** is sampled for conversion into a digital data stream, the sampling frequency must be at least twice that of the highest frequency component of the input signal. If this rule is disobeyed, the sampling process becomes ambiguous as there are insufficient points to define each cycle of the waveform, resulting in enharmonic (false) frequencies being added to the audible signal. Aliasing is also sometimes referred to as fold-over. Once aliasing occurs, there is no way to accurately reproduce the original image from the sampled image.

Aliens _ A familiar term for aliasing effects.

ALiS Plasma Technology _ ***Alternate Lighting of Surfaces*** - Plasma display design creates high-resolution images by alternately lighting complete fields using the same number of display electrodes and LSI drive chips as standard plasma displays. A display operating on an ALIS basis supports high-definition images with a resolution of 1024 (H) x 1024 (V) fixed pixels and aspect ratio of 16:9. By lighting even lines and odd lines alternately every 1/60th of a second, this system makes it possible to double the resolution of a standard VGA electrode without any loss of brightness. This technology allows HDTV broadcasts to be displayed.

All Notes Off _ A three byte MIDI channel message that instructs the receiving device to terminate all notes currently sounding.

Allocation _ The method DOS uses to assign a specific area of the hard drive to a given file.

Alpha _ A fourth color component in the RGB color model representing opacity. Alpha values can range from completely transparent to completely opaque. Important for an image when overlayed (keyed).

Alpha Blending _ The real world is composed of transparent, translucent, and opaque objects. Alpha blending is a technique for adding transparency information for translucent objects. It is implemented by rendering polygons through a stipple mask whose on-off density is proportional to the transparency of the object. The resultant color of a pixel is a combination of the foreground and background color. Alpha blending is usually seen in 3D gaming, it is used to place one texture over the other using transparencies. In DVD it is used to display smoother looking Menu selections and Subtitles.

Alpha Buffer _ An extra Color channel to hold transparency information; pixels become quad values (RGBA). In a 32-bit frame buffer there are 24 bits of color, 8 each for red, green, and blue, along with an 8-bit alpha channel.

Alpha Channel _ A relative transparency value. Alpha channel, in the case of computer- based systems, is the function known as key channel or key level in conventional video technology. Masks can be superimposed on a picture signal, thus enabling different keying tricks such as inserting image signals or executing of chroma keying. One can also say that the alpha channel includes transparency information of a picture file by means of which the transparency between front and background of a picture can be controlled. In a four digit digital sampling structure (4:2:2:4) the alpha channel is represented by the last digit.

Alpha Key _ An effect that makes parts of a foreground image fully or partially transparent based on alpha (transparency) values stored within the image's file, so that an underlying image can show through.

Alpha Mix _ This is a way of combining two images. How the mixing is performed is provided by the alpha channel. The little box that appears over the left-hand shoulder of a news anchor is put there by an alpha mixer. Wherever the little box is to appear, a "1" is put in the alpha channel. Wherever it doesn't appear, a "0" is used. When the alpha mixer sees a "1" coming from the alpha channel, it displays the little box. Whenever it sees a "0", it displays the news anchor.

Alphanumeric _ A combination of letters and numbers.

Alphanumerish _ From "alphanumeric," meaning a combination of letters and digits, alphanumerish uses digits and single letters as shorthand for words. It came about as more and more people send and receive short messages on tiny PDA, pager and cell phone screens. For example, 2U means "to you." UR means "you are."

Amara's Law _ "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run." By *Roy Amara*, past president of *The Institute for the Future.*

Ambience _ The result of sound reflections in a confined space being added to the original sound. Ambience may also be created electronically by some digital reverb units. A room with a lot of reverb is said to be live; one without much reverb is dead. The main difference between ambience and reverberation is that ambience doesn't have the characteristic long delay time of reverberation - the reflections mainly give the sound a sense of space.

Ambient Light _ A lighting model that creates a constant level of illumination on all surfaces, regardless of orientation.

AMD K6 _ For many years Advanced Micro Devices (AMD), like Cyrix, had made 286, 386 and 486 CPUs that were directly derived from Intel's designs. The K5 was the company's first independently created x86 processor, and one for which AMD had held high hopes. In the event, however, it met with only limited success, more as a result of missing its window of opportunity than any particular problems with the processor itself. However, it's purchase of a California-based competitor in the spring of 1996 appears to have enabled AMD to prepare better for its next assault on Intel. The K6 began life as the Nx686, being renamed after the acquisition of NextGen. The K6 range of processors was launched in mid-1997, some weeks ahead of the Cyrix 6x86MX, and met with immediate critical acclaim. Manufactured on a 0.35-micron five-layer-metal process, the K6 was almost 20% smaller than a Pentium Pro yet contained 3.3 million more transistors (8.8 million to 5.5 million). Most of these additional transistors resided in the chip's 64KB Level 1 cache, consisting of 32KB of instruction cache and 32KB of writeback dual-ported cache. This was four times as much as the Pentium Pro and twice as much as the Pen-

tium MMX and Pentium II. The K6 supported Intel's MMX Technology, including 57 new x86 instructions designed to enhance and accelerate multimedia software. Like the Pentium Pro, the K6 owed a great deal to classic Reduced Instruction Set Computer (RISC) designs. Using AMD's RISC86 superscalar microarchitecture, the chip decoded each x86 instruction into a series of simpler operations that could then be processed using typical RISC principles - such as out-of-order execution, register renaming, branch prediction, data forwarding and speculative execution. The K6 was launched in 166MHz, 200MHz and 233MHz versions. Its level of performance was very similar to a similarly clocked Pentium Pro with its maximum 512KB Level 2 cache. In common with Cyrix's MX chip - but to a somewhat lesser extent - floating-point performance was an area of relative weakness compared with Intel's Pentium Pro and Pentium II processors. However, the processor's penetration of the marketplace in late 1997/early 1998 was hampered by problems AMD had in migrating its new 0.25-micron manufacturing process from its development labs to its manufacturing plant. The product line was continued with K6-II and K6-III processors, but ultimately K6 was replaced by Athlon.

Amiga _ A desktop computer series from Amiga, Inc. Originally introduced by Commodore in 1985, the first model was the A1000 with 256KB of RAM, powered by a 7MHz 68000 CPU. Amigas gained a reputation early on as advanced graphics and multimedia machines and NewTek's Video Toaster application brought it to the forefront of economical, high-end video editing. Subsequent machines included the A500, A600 and A1200 home computers and the A2000, A3000 and A4000 models. Commodore went into bankruptcy in 1994, and the technology was purchased by Escom AG, a German PC maker, who created the Amiga Technologies subsidiary. In 1997, Amiga Technologies was purchased by Gateway 2000 and renamed Amiga International. At the end of 1999, Amiga International was acquired by a private party that continues to sell product and maintain the OS.

Amplifier _ A device which increases signal level. An electronic device that takes in an original signal and gives it more power and provides it as an output. Many types of amplifiers are used in audio systems. Amplifiers typically increase voltage, current or both. The resulting signal is a reproduction of the input signal as well as this increase.

Amplitude _ Another word for level. Can refer to sound levels or electrical signal levels. It is the height of a waveform. The greater a sound wave's amplitude, the louder it sounds.

Analog (Game) Control _ While a digital pad can only accept two types of input, on and off, an analog device can sense variable pressure being placed on it. For instance, an analog joystick being pressed gently might cause a character to tiptoe, but pushing the joystick as far as it will go might make the character run at full speed. Analog control provides a more precise input scheme for actions like walking and aiming.

Analog (Analogue) _ A continuous signal that requires time to make a transition from one level to another. The origin of the term is that the electrical signal can be thought of as being analogous to the original signal The principal feature of analog representations is that they are *continuous.* For example, clocks with hands are analog - the hands move continuously around the clock face. As the minute hand goes around, it not only touches the numbers 1 through 12, but also the infinite number of points in between. Similarly, our experience of the world, perceived in sight and sound, is analog. We perceive infinitely smooth gradations of light and shadow; infinitely smooth modulations of sound.. Standard audio and video signals are analog. Both can be digitized. The video in the laserdisc format is analog composite. The audio can be present in both analog and digital forms. Both the audio and video on DVD has been recorded on the disc in the digital domain. Computers are digital, dealing in ones and zeros. The technology in use for more than 50 years to transmit conventional TV signals. Vinyl recordings and audiocassettes are also examples of analog technology.

Analog Computers, Calculators _ Analog computers employ analog or continuous forms for representing their data and employ mechanisms based on analog methods. Such computers are usually special-purpose machines dedicated to very specific tasks. Contrast with digital computer systems.

Analog Media _ The term used to refer to the media found on traditional videotape recordings.

Analog Recording _ A method of recording and encoding information by use of a con-tinuously varying signal, rather than by discrete (digital) pulses.

Analog Signal _ A video or audio signal that varies continuously, as opposed to a digital signal which varies only by fixed steps.

Analog Synthesis _ A method of sound synthesis that relies on predefined waveforms to create sounds that vary over time. The amplitude, frequency and harmonic content of these waveforms can be manipulated to produce a vast number of different results.

Analog TV _ Analog technology has been in use for the past 50 years to transmit conventional TV signals to consumers. "Standard" television broadcasts in analog TV. Analog signals vary continuously, creating fluctuations in color and brightness.

Analog Video _ Analog video is the format used to record images and sound with a analog video cameras and recorders. Some types of analog video include VHS, Super-VHS, Video 8 and Hi-8. Analog video is captured and stored as waves as opposed to the one's and zero's of digital video. Analog video is notorious for its generational loss quality. Each time it is recorded and then exported and recorded again - the quality gets worse and worse.

Analog vs. Digital Film Soundtrack _ The width of an analog soundtrack of the contemporary movies varies in a way that is directly analogous to the varying soundwaves of the original sound. When played back, the varying width of the track is translated to a varying electrical voltage which ultimately causes the loudspeaker cones to move back and forth to recreate the original sound. With a digital soundtrack, points along the soundwaves of the original sound are assigned a numeric (or digital) value, consisting of ones and zeroes represented as tiny dots on the track. When a digital track is played back, the numeric values are converted to the varying electrical voltage needed to drive the speakers.

Analytical Engine _ A design for a general-purpose programmable computer created by Charles Babbage in the early 19th century. Although the design was close in concept to the electronic computers that would be built a century later, Babbage's design was never realized in hardware. This was because the mechanical device he envisioned could not be constructed to the proper tolerances given the manufacturing technology of his day.

Anamorphic _ a) A type of lens or adapter designed to produce a wide-screen image from a condensed image on the film. For example, most Hollywood motion pictures are projected in a theatre at an aspect ratio (or proportion) of 2.35:1. The aspect ratio (or proportion) of 35mm film is not that wide. In order to fit a 2.35:1 image on a 35mm surface, special "anamorphic lenses" are used on the cameras to squeeze the wide image onto the smaller frame. Then, when the film is projected in the theatre, the projectors use special anamorphic lenses to "unsqueeze" the image back into a wide aspect ratio. Trademarks are held by CinemaScope, Panavision and Vistavision. _ **b)** An image intended for viewing on Widescreen TV's with a 19:9 ration screens resolution. Anamorphic supplementary lenses are used to change the proportions of an image to 16 x 9 on the surface of a 4 x 3 sensor by either extending the horizontal axis or compressing the vertical. Consumer video cameras often brag about a 16:9 feature. These are usually NOT true anamorphic images. They are simply 4:3 images with black bars across the top and bottom to give the illusion of widescreen anamorphic. True anamorphic images must be achieved through the use of lenses. Signals from 16 x 9 cameras and telecines produce an "anamorphic" signal which is electrically the same as with 4 x 3 images but will appear horizontally squashed if displayed at 4 x 3. stretched. _ **c)** Found on a large number of DVD's, anamorphic video appears to squeeze a 1.78 picture shape into a 1.33 image area. A technique used to increase the vertical scan line thus improving the visual quality of wide screen encoded titles. It uses 33% more scan lines compared to normal encoding, and the resulting image is scaled back to the original size by the DVD decoder. This method wastes less of the encoding space on the black lines usually associated with Wide Screen encoding.

Anchor _ an underlined link within a webpage. Clicking on an anchor will take you to that heading or section of the page. Anchors make it easier for people to get around a webpage, and save wear and tear from too much scrolling up/down the page!

AND _ This term links two or more search enquiry items together which allows you to narrow down a search. In this context it is known as a Boolean Expression. For example, if you entered the word Computer AND Tuition you would be presented with Web pages containing both words, and not just either one of them.

Angle (DVD) _ 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 angles.

Animated Gif _ A series of individual gif images can be saved within a special animation application so that when they're combined together they form a short sequence of "what appears to be" moving images. Applications that support the animated GIF standard (GIF89A) cycle through the images, creating the impression of motion. The animated GIF format does not provide as much control and flexibility as other animation formats but, because it is supported by nearly every Web browser, has become very popular.

Animatic _ A limited animation used to work out film or video sequences. It consists of artwork shot on film or videotape and edited to serve as an on-screen storyboard. Animatics are often used to plan out film sequences without incurring the expense of the actual shoot.

Animation _ Process in which a sequence of moved images is created by combining different frames of still artwork or objects. Two versions, i.e. 2D and 3D animation, exist. In the case of editing systems, single graphics or titles can be animated to form a moved image sequence.

Animation Path _ An editable line that objects follow during the course of an animation.

Anime _ Japanese animation. Typically containing more mature or adult-oriented subject matter than traditional cartoons or animated films, anime has found a continuously expanding audience outside Japan in recent years. Many video games of late feature anime-style videos.

Anonymous ftp Servers _ A special class of Internet servers which allow users to sign on temporarily even if they do not have accounts on the given server. Such servers are used to make computer files readily available to the public for downloading over the Internet.

ANSI _ *American National Standards Institute.* A governmental body of the United States responsible for approving US standards in many areas, including computers and communications. ANSI is a member of the International Standards Organization (ISO).

Anti - aliasing _ Smoothing or reducing disturbing picture effects caused by aliasing. Filters and interpolation are used for this purpose. By means of interpolation, i.e. the calculation of intermediate values along the sharp edges of types and graphics, these edges can be smoothed out, thus generating a smoother picture. The pixel structure along tilted or bent edges is mixed with the surrounding colors, i.e. the transition area becomes a bit "blurry". Most, but not all, DVEs and character generators contain anti-aliasing facilities. In order to anti-alias an image when rendering, the computer has to take samples smaller than a pixel in order to figure out exactly where to blur and where not to. For example, if the computer finds that one pixel is on the edge of two objects, it then takes sub-pixel samples and checks about how many of them showed the front object, and how many showed the back one. Lets say that the computer took 8 sub-samples, and 4 of them were on object one and the other 4 on object two. The computer then takes the resulting color values from the subsamples and averages them into a resulting blurred pixel, when viewed from a distance gives a smoother edge effect.

Anti - aliasing Filter _ Filter used to limit the frequency range of an analog signal prior to A/D conversion so that the maximum frequency does not exceed half the sampling rate.

AOD _ *Advanced Optical Disk* - is similar to the blue ray disk - a CD size (5.25" or 120mm) optical data storage media, that uses a blue laser at 405 nm wavelength. It has a capacity of 15 GB and does not use a caddy. The cover layer is like the DVD 0.6mm thick (unlike the blue-ray disk at 0.1mm). The AOD is promoted by Toshiba and NEC and is a direct competitor of the blue ray disk. On November 19, 2003, the DVD-Forum has decided with eight to six votes, that the AOD will be the HDTV successor of the DVD. The current specification is version 0.9, the final version is expected in 2004, the first devices are expected 2005. A vote in June 2003 did not get a majority for AOD, instead the Blue ray disk was promoted. To compensate the lack of storage space (15GB instead of Blue ray disks 25GB) is to be compensated with a better codec, here Windows Media 9 or H.264.

Aperture Correction _ As applied to a video signal, this is frequency peaking, usually at just one frequency, to compensate for loss of picture detail. Aperture correction is applied in the video camera. The sharpness control, in the display device, serves a similar frequency compensation function. There are times when the terms "sharpness" and "aperture correction" are used interchangeably.

Aperture Delay _ Aperture delay is the time from an edge of the input clock of the ADC until the time the ADC actually takes the sample. The smaller this number, the better.

Aperture Jitter _ The uncertainty in the aperture delay. This means the aperture delay time changes a little bit each time, and that little bit of change is the aperture jitter.

API _ *Application Programming Interface* These pre-defined software interfaces allow communication between different software applications. Plug ins, for example, can be included in the editing software application via API. Also the interplay between editing software and a video board, for example the perfect utilization of effect hardware, is realized via API.

APL _ *A Programming Language* - A high-level mathematical programming language noted for its brevity and matrix generation capabilities. Developed by Kenneth Iverson in the mid-1960s, it runs on micros to mainframes and is often used to develop mathematical models. It is primarily an interpreted language, but compilers are available. APL uses unique character symbols and, before today's graphical interfaces, required special software or ROM chips to enable the computer to display and print them. APL is popular in Europe.

Appgen _ *Application Generator* - Software that generates application programs from descriptions of the problem rather than by traditional programming. It is at a higher level and easier to use than a high-level programming language. One statement or descriptive line may generate a huge routine or an entire program. However, application generators always have limits as to what they can be used for. Generators used for complex program development allow if-then-else programming to be expressed along with the simpler descriptive entries.

Apple _ A manufacturer of desktop and laptop computers and the industry's most fabled story. Founded in a garage by Steve Wozniak and Steve Jobs and guided by Mike Markkula, Apple was formed on April Fool's Day in 1976. After introducing the Apple I at the Palo Alto Homebrew Computer Club, 10 retail stores were selling them by the end of the year. In 1977, the Apple II was introduced, a fully-assembled computer with 4K RAM for $1,298. Its open architecture encouraged third-party vendors to build plug-in hardware enhancements. This, plus sound and color graphics, caused Apple IIs to become the most widely used computer in the home and classroom. They were also used in business primarily for the innovative VisiCalc software that was launched on it. In 1983, Apple introduced the Lisa, the forerunner of the Macintosh. Lisa was aimed at the corporate market, but was soon dropped in favor of the Mac. As a graphics-based machine, the Mac was successful as a low-cost desktop publishing system. Although praised for its ease of use, its slow speed, small monochrome screen and closed architecture didn't excite corporate buyers. But, things were to change. In 1987, the Mac II offered higher speed, larger screens in color and traditional cabinetry that accepted third-party add-in cards. Numerous models were offered and widely accepted. In 1991, Apple surprised the industry by announcing an alliance with IBM to form several companies that would develop hardware and software together. All these eventually folded back into Apple and IBM, but the major product of the alliance was the PowerPC chip. In 1994, Apple came out with its first PowerPC-based PowerMacs, which proved very popular. Its PowerBook laptops were an instant success, and all subsequent models departed from the original Motorola 680x0 architecture to the PowerPC. Apple has stood alone in a sea of IBM and IBM-compatible PCs for more than a decade and a half. It has watched its graphical interface copied more with each incarnation of Windows and watched its market share drop simultaneously. In late 1994, Apple began to license its OS to system vendors in order to create a Macintosh clone industry, which pundits had been suggesting for years. However, a couple of years later, that was discontinued. In 1997, Apple acquired NeXT Computer, which brought Steve Jobs back to the company he founded and gave it a raft of object-oriented development tools, parts of which filtered down into the Mac OS X operating system. In 1998, Apple introduced the iMac, a low-priced Internet-ready Mac that was the first personal computer without a floppy disk. Self-contained in one unit like the original Mac, Apple sold 800,000 iMacs in a year, making it the fastest-selling computer in its history. Apple's subsequent models, including the G4 Cube and Titanium portable, are in a class by themselves. Apple continues to offer attractive alternatives to the Windows-based PC. Today, G5 is one of the "hottest" computer products.

Applet _ A multimedia application written or embedded in the Java language in the form of sounds or animation and only viewable in a Browser enabled for Java such as Internet Explorer v5 (or better) and Netscape Navigator v4.2 (or better). An applet is not usually viewable on earlier operating systems or computers over 5 years old running on DOS and Win 95.

Application _ The highest level of software that the user sees. It is above the operating system's software level, which may be running within an environment. Also a generic term for software programs and/or developers.

Applications Software, Programs _ Programs designed to solve problems in a specific problem domain is referred to as applications software. For example, word processing software is designed for a very specific collection of tasks, as is spreadsheet software, and so on. Such software is in contrast to systems software which is designed to perform a variety of general tasks for its user.

ARB _ *Architecture Review Board* - An independent consortium that governs OpenGL specifications, defines conformance tests and approves OpenGL enhancements. The board includes representatives from companies such as 3DLabs, Apple, ATI, Dell, Evans & Sutherland, Hewlett-Packard, IBM, Intel, Matrox, NVIDIA, SGI, Sun Microsystems.

Arbitration _ The act of determining which command, device, or communication protocol controls the operating environment.

Arcade Games _ As distinct from console and computer games, arcade games, or "coin-ops", are machines in which players must put coins in order to play a game. Arcade games usually represent the cutting edge of games technology and can cost arcade operators up to $ 20,000 per machine.

Archie Servers _ An archie server is a host on the Internet that contains an up-to-date listing of the directory contents of anonymous ftp servers registered with it. In other words, archie servers act like card catalogs for Internet anonymous ftp servers.

Architecture _ a) The basic design of a computer system, its circuitry, microprocessor, memory, etc., and its connectivity of components. **_ b)** In digital video, architecture (sometimes also known as format) refers to the structure of the software responsible for creating, storing, and displaying video content. A architecture may include such things such as compression support, file formats, server software, system extensions, and browser plug-ins. Different multimedia architectures offer different features and compression options, and store video data in different file formats. QuickTime, RealVideo, and MPEG are examples of video architectures (though MPEG is also a type of compression).

Architecture Neutral _ Refers to software that is designed without regard to the target platform. Software is often written to maximize the performance of a specific hardware platform, but such software must be modified to make it run on other hardware. It is always a tradeoff. The more specialized the software, the faster the performance of the hardware, but the more difficult to make the software work on other platforms.

Archival Image _ An image meant to have lasting utility. Archival images are usually kept off-line on a cheaper storage medium such as CD-ROM or magnetic tape, in a secure environment. Archival images are of a higher resolution and quality than the digital image delivered to the user on-screen. The file format most often associated with archival images is TIFF, or Tagged Image File Format, as compared to on-screen viewing file formats, which are usually JPEGs and GIFs.

Archival Scans _ Digital images serve as surrogates of the original. At this point in time, there is no such thing as an Archival or Preservation scan that acts as an exact replica or replacement of the original, as it is not yet possible to record every piece of information found in the original with today's scanner technology.

Archive _ Archives are usually large files that have been compressed, and sometimes they may even contain several other smaller files.

Pictures and sound stored in digital form can be archived and recovered without loss or distortion. The storage medium must be both reliable and stable and, as large quantities of information need to be stored, cost is of major importance. Currently the lowest cost is magnetic tape but there is increasing interest in optical disks - more expensive but with far better access. Traditionally material is archived after its initial use - at the end of the process. More recently some archiving has moved to the beginning. An example is news where, in some cases, new material is archived and subsequent editing, etc, accesses this. This reflects the high value of video assets where rapidly increasing numbers of channels are seeking material. **_ a)** In ***computer environment*** some examples of archive file extensions are: zip, tar, arc, lzh and ARJ. "Winzip" is the most popular computer program for home users for compressing files and it's often used to reduce the size of large ones prior to them being attached to E-Mails. **_ b)** ***Archival images*** are usually kept off-line on a cheaper storage medium such as CD-ROM or magnetic tape, in a secure environment. Archival images are of a higher resolution and quality than the digital image delivered to the user on-screen. The file format most often associated with archival images is TIFF, or Tagged Image File Format, as compared to on-screen viewing file formats, which are usually JPEGs and GIFs. **_ c)** In the world of ***digital video***, VTRs, rather than data recorders, often are the most efficient and practical means of video archive - offering both very high packing density on tape and direct viewing, even while spooling. Non-compressed component digital formats, D1 and D5 give the best quality. There is also interest in archive at 50 Mb/s, about 3:1 compression. For digital film image archive Quantel has devised the D16 format so that full film resolution images can be stored and viewed on standard ITU-R BT.601 recorders. **_ d)** Archiving an ***editing or compositing session***, requiring data on all aspects of the session to be stored, becomes practical with integrated equipment (e.g. non-linear suites). Beyond an EDL this may include parameters for color correction, DVE, keying, layering etc. This data can be transferred to a removable medium such as a floppy disk or an MO.

Archive Site _ This is one that contains archived (i.e. compressed files) which are available for download by ftp or E-Mail.

Area CCD _ A square or rectangular CCD that can capture an entire image at once, which is essential for dynamic subjects and flash photography.

Areal Density _ The number of bits of data that can be recorded onto the surface of a disk or platter usually measured in square inches. The areal density is calculated by multiplying the bit density (BPI - Bits Per Inch) by Tracks Per Inch (TPI).

Arithmetic Logic Unit (ALU) _ The component of the central processing unit (CPU) that is responsible for carrying out the arithmetic and logical operations to be performed on data stored in the CPU's registers.

ARJ _ Format of the archive files. Allows the user to store one or more files in a compressed format in an archive file, thus saving space both in the size of the compressed file and the amount of space it occupies when saved to disk. Excellent for compressing databases, large multi page documents and things like address books, etc.

ARM Chips _ are high-speed CPUs that are known for their small die size and low power requirements. They are widely used in PDAs and other handheld devices, including games and phones as well as a large variety of consumer products. The StrongARM chip is a high-speed version jointly developed with Digital.

ARPA _ *Advanced Research Projects Agency* - The American Governmental Organization who were responsible for creating an experimental Network which eventually become the start of the Internet as we know it.

ARPANET _ The forerunner of the Internet, ARPANET was an early packet-switching network sponsored by the Defense Department Advanced Research Project Agency. Founded in seventies, ARPANET was initially composed of only four sites or nodes (UC Berkeley, Stanford, X, and the University of Utah). The size and influence of the network grew with many new nodes and networks joining its span. ARPANET was later decommissioned in eighties, though its legacy lives on as the Internet.

Arpeggiator Device _ (or software) that allows a MIDI instrument to sequence around any notes currently being played. Most arpeggiators also allows the sound to be sequenced over several octaves so that holding down a simple chord can result in an impressive repeating sequence of notes.

Array Processor _ A computer, or extension to its arithmetic unit, that is capable of performing simultaneous computations on elements of an array of data in some number of dimensions. Common uses include analysis of fluid dynamics and rotation of 3-D objects as well as data retrieval, in which elements in a database are scanned simultaneously.

Artefact (artifact) _ Literally, this means something created by humans. In the world of digital technology, in refers to an undesirable degradation of an electronic image or a sound signal. These distortions can result in random sounds, video flickering, and ghost objects on pictures. The usually occur during the electronic capture, manipulation, or output of data. In video technology, this term describes visible, disturbing defects in pictures caused by technical limitation – seen as patterns, blemishes, noise, snow, spots. Oftentimes they cannot be described by technical measured variables. Noise signals at object edges or undesired contours in picture sections often occur in picture areas in which smooth transitions should be displayed. Artefacts also often occur in cases where the amount of video data is considerably decreased as a result of high compression rates. The visible and typical "building block effects" of highly compressed video signals are called artefacts.

Artificial Intelligence (AI) _ **a)** The area of computer science focused on creating computer programs that exhibit behavior which we would ordinarily consider intelligent. Compare with the field of cognitive science. _ **b)** A set of programmed routines designed to give lifelike behavior to computer-controlled enemies in the gaming environment. The effectiveness of such routines varies from game to game - some games focus more heavily on AI than others, resulting in more realistic opponents.

Artilect _ *Artificial Intellect* - A machine that is more intelligent than a human being. The term was coined by Dr. Hugo de Garis at Utah State University.

ASCII _ *American Standard Code for Information Interchange* - It is consisting of 7-bit coded characters (8 bits including parity check), utilized to exchange information between data processing systems, data communication systems, and associated equipment. Standard ASCII assigns the numbers 0-127 to different alphabetic and control characters. Extended ASCII, used in the IBM PC and its clones, extends this character set

to 256 to include non-English and graphic characters. A document saved in ASCII text can be read by almost any word processing program regardless of computer type or program used. On the Macintosh, ASCII text is sometimes called "plain text" which refers to its inability to contain formatting options (i.e. italic, bold, typeface, etc.).

ASCII Art _ Pictures created with normal text characters. This is done by hand or with programs that convert scanned images into ASCII characters.

ASF _ *Advanced Streaming Format* - ASF is the file format in the Windows Media architecture. Microsoft's streaming media format, which supports audio, video, slide shows and synchronized events. ASF is used in Microsoft's NetShow, a utility for receiving audio, video and live broadcasts over the Internet. There are two file types associated with this format. An .asx file is used to signal the Web browser to call Windows Media Player and load an .asf file, which contains the streaming content.

ASIC _ *Application Specific Integrated Circuit* - A custom designed integrated circuit with functions specifically tailored to a particular application. This effectively replaces the many discrete devices that could otherwise do the job but its performance will be superior. Being far more compact than the separate components, the single chip can work faster than an array of separate chips. Often a ten-fold increase in speed is achieved, while the power consumption can drop by a similar factor and reliability is greatly increased. ASICs can be divided into User-Specific ICs (USICs), which are designed for individual users, and Application-Specific Standard Products (ASSPs), which are produced for use by general users. Depending on the degree of original design/layout development involved, ASICs can be divided further into full-custom ICs and semi-custom ICs, such as gate arrays

ASK _ *Amplitude Shift Keying* - A digital amplitude modulation method.

ASMO _ *Advanced Storage Magneto-Optic* - An enhanced magneto-optic, rewritable disk that holds 6GB. Using 120 mm (CD size) disks, ASMO evolved from a 7GB MO7 specification. Its major supporter is Fujitsu.

ASMP _ *Asymmetric Multiprocessing* - A multiprocessing design in which each CPU is assigned a particular program or part of a program that it executes for the duration of the session. Contrast with SMP, in which all the CPUs function as a single resource pool and take on whatever tasks need to be processed next.

ASP _ A document that contains embedded server side scripting (known as an active server page). On the client side (i.e. your computer) an ASP is a standard html web document that can be viewed in any Web Browser on any computer.

Aspect Ratio _ **a)** *of pictures* This is the ratio between the length and the width of video images. The aspect ratio of 4:3 determined in the PAL, NTSC and Secam TV systems has had the upper hand thus far. The trend towards wider screen formats, which has been evident in cinema for some time now, is also hitting the small screen. More advanced TV systems such as _PALPLUS or _HDTV are banking on a wider screen with an aspect ratio of 16:9. Those in favor of 16:9 argue that, in comparison with the almost square 4:3 ratio, the wider screen corresponds more to the human visual range. In many recording and postproduction devices it is possible to change between the aspect ratios 4:3 and 16:9. _ **b)** *of pixels* The aspect ratio of the area of a picture described by one pixel. The ITU-R BT.601 digital coding standard defines luminance pixels which are not square. In the 525/60 format there are 486 active lines each with 720 samples of which 711 may be viewable due to blanking. Therefore the pixel aspect ratio on a 4:3 screen is: 486/711 x 4/3 = 0.911 (i.e. the pixels are 10% taller than they are wide) For the 625/50 format there are 576 active lines each with 720 samples of which 702 are viewable so the pixel aspect ratio is: 576/702 x 4/3 = 1.094 (i.e. the pixels are 9% wider than they are tall) The newer DTV image standards, including those for HD, define square pixels. Account must be taken of pixel aspect ratios - for example in executing a DVE move - when rotating a circle, the circle must always remain circular and not become elliptical. Another area where it is important is the movement of images between computer platforms and television systems. Computers nearly always use square pixels so their aspect ratio must be adjusted to suit television. This process takes time and will not be perfect and the quality of the result will depend on the quality of the processing used.

ASPI _ *Advanced SCSI Programmer's Interface* - A layer of code that manages communication between software and SCSI cards.

Assemble Editing _ Recording new video and audio material sequentially onto tape. Because all the signals are recorded (video, audio, and control track), the new material completely replaces any previously recorded material on the tape.

Assembler _ A program designed to translate mnemonic assembly language programs into native machine language programs which can be run directly on the host computer.

Assets _ The video and audio clips, stills, titles, and any other materials that comprise the content of a video production.

ASSP _ *Application Specific Standard Product* - An integrated circuit dedicated to one specific application (like a custom IC) but with several possible customers (unlike a custom IC)

ASV _ *Audio Still Video* - A still picture on a DVD-Audio disc.

Asymmetric Codecs _ Compression /decompression methods in which the time to compress is significantly different from the time to decompress. For example, methods which take much longer to decompress are useful for data storage so long as the need to decompress quickly is not a priority. Of course, these methods would not be useful for playing audio and video. On the other hand, methods requiring less decompression time might be very useful for compressing files that are accessed frequently (but not changed).

Asymmetrical _ Asymmetrical lines are shielded with a single-wire and used, among other things, for transmitting audio signals (cinch). In contrast to symmetrical audio lines, they are more susceptible to disturbances.

Asynchronous _ Lacking synchronization; not coordinated in time; contrasted with synchronous. In a typical synchronous protocol, each successive transmission of data requires a response to the previous transmission before a new one can be initiated. An asynchronous protocol allows transmissions to occur independently of one another. _ **a)** In computer communications using asynchronous protocols, each piece of data usually has a start bit at the beginning and a stop bit at the end, so that the valid data can be distinguished from random noise. Most communications between computers and devices are asynchronous; Internet is based on an asynchronous system. _ **b)** In video, a signal is asynchronous when its timing differs from that of the system reference signal. A foreign video signal is asynchronous before it is treated by a local frame synchronizer.

Asynchronous Transfer Mode (ATM) Network _ A relatively new network transmission technique which provides high-speed, wide-bandwidth capabilities. ATM can support the higher-performance demands of multimedia transmissions. AT combines the best features of packet-switching and circuit-switching systems.

ATA _ *Advanced Technology Attachment* Name used by ANSI to describe what the computer industry calls IDE (Integrated Drive Electronics).

ATAPI _ *Advanced Technology Attachment Packet Interface* - It's the recognized standard for connecting a CD-ROM Drive to an enhanced IDE adapter (which is what most computers use to handle their hard disk/s) and now that ATAPI is accepted as the standard it's made the installation of a CD-Rom drive a much easier task.

ATC _ *Adaptive Transform Coding*.

Athlon _ A Pentium III-class CPU chip from AMD. The first models were introduced in 1999 with clock speeds from 500MHz to 650MHz and a 200MHz system bus. Subsequent models have exceeded 1GHz clock, and the bus was increased to 266MHz. The Athlon contains the MMX multimedia instructions used in Pentium MMX and Pentium II CPUs along with an enhanced version of Aid's 3DNow 3-D instruction set for faster rendering of games and animation. The Athlon plugs into a slot, known as Slot A, which is similar to the elongated slot used by Pentium II's and III's. The Athlon is the successor to the K6 series and was formerly known as the K7.

Athlon 64 _ the newest AMD processor that enables simultaneous high performance for 32- and 64-bit computing. It has 128-bit integrated DDR memory controller that can manage memory bandwidth up to 6.4GB/sec and HyperTransport technology enabling increased bandwidth and reduced I/O bottlenecks. It also feature a large on-die cache memory system -1152KB total effective cache.

Athlon XP _ A family of CPU chips from AMD that was introduced in 2001. Departing from the traditional MHz designation, Athlon XP chips use model numbers that combine clock speed and architectural features into a numerical rating. For example, the 1500+, the first XP model, has a clock speed of 1.33GHz, but provides greater performance than the Athlon 1.4GHz chip.

A - Time _ *absolute time* - In an Audio CD, the time elapsed since the beginning of the CD. It can be used in determining the start and stop times of sound segments for programming an application on a Mixed-Mode CD, measuring from the very beginning of the data area (including the computer data in Track 1).

ATM _ a) *Adobe Type Manager* is software from Adobe that helps create an accurate screen display of PostScript fonts and allows Photoshop to create smooth anti-alias type at any size. **_ b)** *Asynchronous Transfer Mode*. A network protocol which was originally designed for the telecommunications market. ATM enables the operation of networks that allow high-speed data transfer. ATM is capable of transmitting digital high quality live video Sequences or of shifting extremely large files between different work places. It remains to be seen whether ATM will be widely used in the field of video technology.

ATRAC _ *Adaptive Transform Acoustic Coding* - Sony's perceptual coding system used in MiniDisc systems. It compresses the digital information needed to reproduce an audio signal while discarding inaudible sound information, thus reducing the space the signal takes up on the disc.

ATSC _ *The Advanced Television Systems Committee* was formed to establish voluntary technical standards for advanced television systems, including digital high definition television (HDTV), standard definition television (SDTV), data broadcasting, multichannel surround-sound audio, and Satellite direct-to-home broadcasting .

Attached _ A physical channel (in DTV) of a digital picture manipulator is attached to a logical channel of a controller if the physical channel is successfully acquired by the controller. A physical channel may be attached to only one logical channel of one controller at a time.

Attack _ The initial stage of an envelope. Refers to the time taken for a sound to achieve maximum amplitude. Drums have a fast attack, whereas bowed strings have a slow attack. In compressors and gates, the attack time equates to how quickly the processor can change its gain.

Attributes _ people have characteristics, files have attributes. Common attributes of files, which make describing them, and finding them much easier, are: file name or part name ("name contains"), file size equals, is more than is less than; date created or changed was, was before, was after; location - on what disk?; file type: program/ application, document (of what kind?), image file (of what kind?); your operating system will offer your various ingenious ways to find files.

ATV _ *Advanced Television -* The term used in North America to describe television with capabilities beyond those of analogue NTSC. It is generally taken to include digital television (DTV) and high definition (HDTV).

AU (also SND) _ Interchangeable audio file formats used in the Sun Sparcstation, Nest and Silicon Graphics (SGI) computers. Essentially a raw audio data format proceeded by an identifying header. The .au file is cross-platform compatible.

Audio _ Of or concerning sound, specifically the electrical currents representing a sound program or the sound portion of an A/V program.

Audio Annotation _ The ability of a digital still camera to capture short segments of sound associated with an image. This feature can be used for creating audio notes related to the image such as location info, or to capture the ambient sound at the time the image is taken.

Audio Bandwidth _ The signal range from 20 Hz to 20 kHz, according to the standard specification, although there is some evidence of acoustic perception outside that bandwidth in exceptional individuals, particularly young children.

Audio Breakaway _ Term typically used to describe a separate signal routing path for Audio from Video. A router with audio breakaway capability can be said to provide a choice of switching. At least a specific group of channels of audio independently from the way video is switched within different levels of control circuits of the same router frame versus switching audio to or from the same source or destination at the same time as video is switched.

Audio Channel Number _ The consecutive numbers assigned to the audio channel of the audio stream. They range from 0 to 7 in the description of the Video Title Set manager area. ACH0 and ACH1 are assigned to the left channel and the right channel, respectively, for two-channel stereo audio signals.

Audio Clip _ Digital audio data are often known as audio clips. This is true for audio elements that are placed on the timeline in the case of editing systems for further processing as well as for wave files and other audio files that can be intended for completely different uses.

Audio Codec _ A hardware circuit (chip) or software routine that converts sound into digital code and vice versa. The first step is to convert the analog sound into digital samples, using PCM or ADPCM. The next step is to use perceptual audio coding to further compress the amount of digital data. If the codec is specialized for human voice, it is also known as a "speech codec," "voice codec" or "vocoder."

Audio Compression _ Encoding digital audio data to take up less storage space and transmission bandwidth. Audio compression typically uses lossy methods, which eliminate bits that are not restored at the other end. ADPCM and MP3 are examples of audio compression methods.

Audio Effects Board _ Similar to a switcher, an audio effects board is the primary router and mixer for source audio, and for adjusting, mixing, and filtering audio. Usually, a digital audio workstation is used to perform more complex audio work.

Audio Image File _ A computer file which holds audio data used to create a Red Book Audio CD.

Audio Modulation _ Refers to modifying an audio subcarrier with audio information so that it may be mixed with the video information and transmitted.

Audio Normalling _ Term used to describe a wiring pattern in a patch panel in which a circuit path is established from one point of contact to another separate point of contact (usually above or below the first point of contact) without the use of a patch cord. If a patch cord is inserted, then the established path is interrupted and rerouted along the patch cord to a different circuit path. "Nor-malled" patch panels allow a "normal" commonly used circuit path to remain connected without the use of a patch cord, yet provide flexibility in connecting either the sending (source) circuit or the receiving (destination) circuit to a different circuit entirely, or through the use of a terminating patch plug, or a self terminating patch panel, to end the signal path of the sending circuit. Through the use of cables with patch cord ends, a source or a destination may also be entirely off the patch panel altogether.

Audio Scrubbing _ Playing back a section of an audio file by highlighting the particular waveforms. The term was coined in the days of audio tape when manually moving the reels back and forth looked like the tape was being scrubbed.

Audio Subcarrier _ A specific frequency that is modulated with audio data.

Audio Sweetening _ Processing audio to improve sound quality or to achieve a specific effect.

Auditorium Management System _ A complete system for storing and managing digital cinema programs. This system offers step-by-step menus on a built-in graphics screen that control and monitor all aspects of the digital cinema operation in the theatre.

Auditory Masking _ The psycho-acoustic phenomenon of human hearing where what can be heard is affected by the components of the sound. For example, a loud sound will mask a soft sound close to it in frequency. Audio compression systems such as Dolby Digital and MPEG audio use auditory masking as their basis and only code what can be heard by the human ear.

Authentication _ In a multi-user or network environment, it's the process by which the system validates a user's logon information. A users name and password are compared against an authorized list and if the system detects a match, access is granted.

Authoring _ What you do to create an application which may eventually be stored on a CD. For example, if you want to create a multimedia game or presentation, you need an authoring software program that allows you to combine sound, graphics, and text with user interactivity. When you finish creating your application with the authoring software, you can record it to CD.

Authoring program _ Software that allows for the creation of tutorials, CBT courseware, Web sites, CD-ROMs and other interactive programs. Authoring packages generally provide high-level visual tools that enable a complete system to be designed without writing any programming code, although a proprietary authoring language may also be included.

Auto Assembly _ An edit in which an off-line edit decision list is loaded into an on-line edit computer and all the edits are assembled automatically with little or no human intervention.

Auto Defect Retirement _ If the hard drive finds defective sectors during reads or writes, they are automatically mapped out and relocated.

Auto Thumbnail _ A tool that creates a thumbnail image of a picture or photograph and a hyperlink to the original picture, which is often larger.

Automata Theory _ An open-ended computer science discipline that concerns an abstract device called an "automaton," which performs a specific computational or recognition function. Networks of automata are designed to mimic human behavior.

Automated Speech Recognition _ Hardware/software systems that are capable of translating the spoken word or conversation into another useable representation--such as text. Automated speech recognition systems are either speaker-dependent (trained to a single user's speech) or speaker-independent (capable of interpreting different speakers).An area of research in artificial intelligence.

Automatic Convergence _ The automatic alignment of the red, green and blue color images on a screen.

Automatic Head Parking _ Turning off the hard drive power causes the drive to move the read/write heads to a safe, non-data Landing Zone and lock into position, improving data integrity and resistance to non-operational shock.

Automatic Level Control _ In audio recording, a circuit used to control the volume or level of the recorded signal automatically without distortion due to overload. Sometimes called automatic gain control (AGC), or automatic volume control (AVC). An ALC defeat control permits manual level control for wide ranges or special recording purposes.

Automation _ The replacement of manual operations by computerized methods. Office automation refers to integrating clerical tasks such as typing, filing and appointment scheduling. Factory automation refers to computer-driven assembly lines.

Autotiming _ Capability of some digital video equipment to automatically adjust input video timing to match a reference video input. Eliminates the need for manual timing adjustments.

Autotrace _ A routine that converts a bitmap into a vector graphics image. It scans the bitmap and turns the dark areas into vectors (lines). Once a bitmap has been turned into vectors, individual components of the drawing can be scaled independently. This process usually creates many more vectors than if the picture were drawn in a drawing program in the first place. In order to faithfully reproduce the original, the conversion routine will generate a vector for the slightest deviation in a line. However, extraneous vectors can be deleted afterwards.

AUX _ *Auxiliary -* Refers to an auxiliary input. _ **a)** In a video editing system, a channel reserved for connecting an external audio and/or video device. _ **b)** Control on a mixing console designed to route a proportion of the channel signal to the effects or cue mix outputs.

Auxiliary Memory _ A high-speed memory bank used in mainframes and supercomputers. It is not directly addressable by the CPU, rather it functions like a disk. Data are transferred from auxiliary memory to main memory over a high-bandwidth channel.

AV _ *Audiovisual* - The making use of or relating to both hearing and sight and to electronic media in general.

AV Disk Drives _ Most disk drives are intended for pure data applications but AV drives are designed especially for audio/video. The extremely high storage capacities achieved on modern small format drives result in the tracks being packed very tightly across the disks - many tracks are recorded within a "paper thin" distance. Distances are so minute that thermal re-calibration has to be used to ensure the read/write heads remain accurately placed over the tracks. On AV disks thermal recalibration is built-in as a part of their continuous operation whereas pure "data" disks will regularly take time out for re-calibration - making them not well suited for video where pictures and sound must flow continuously.

AV NET _ Provides control of external Home Theater components using infrared "flashers" and on-screen "soft keys." Inputs can be selected by device name "DVD" rather than input number and components can be controlled in cabinets.

AVC _ *Advanced Video Coding* - also known as MPEG-4 part 10, or MPEG-4 AVC. The codec has been developed in a joint ITU-T venture called Joint Video Team.

Average Access Time _ The average length of time a hard drive takes to perform seeks, usually measured with 1/3 stroke.

AVI _ *Audio Video Interleave* - the algorithm created by Microsoft for synchronizing and compressing analog audio and video signals. Allows sound and vision to be stored in one file, making lip sync more accurate. AVI is a *container* video format that specifies certain structure how the audio and video streams should be stored within the file. AVI itself **doesn't** specify how it should be encoded *(just like the streaming format ASF)*, so the audio/video can be stored in very various ways. Most commonly used video codecs that use AVI structure are M-JPEG and DivX. AVI contains code called FourCC which tells what codec it is encoded with. Since it's software-based, AVI files can be played with the respective software without the help of addi-

tional special video hardware. AVI is also the file format used by Video for Windows.

AVO _ *Audiovisual object*. In MPEG-4, audiovisual objects (also AV objects) are the individual media objects of a scene--such as video objects, images, and 3D objects. AVOs have a time dimension and a local coordinate system for manipulating the AVO are positioned in a scene by transforming the object's local coordinate system into a common, global scene coordinate system.

AWGN _ *Additive White Gaussian Noise*.

AWGTHTGTTA _ Digispeak for "are we going to have to go through this again?"

Axis (x, y, z) _ Used to describe the three dimensional axes set at right angles to each other, available in DVE manipulations. The X axis is a horizontal line across the center of the screen, the Y axis is a vertical line, and the Z axis is in the third dimension, perpendicular to the X and Y axes, and indicates depth and distance. Depending on the power of the equipment and the complexity of the DVE move, several sets of *xyz* axes may be in use at one time. For example, one set may be referred to the screen, another to the picture and a third off-set to some point in space (reference axis).

AYT _ Digispeak for "are you there?"

B - frame _ Bi-directional predictive frames used in inter-frame compression schemes like MPEG-2. They are composed by assessing the difference between the previous and the next i-frames in a television picture sequence. As they contain only predictive information, they do not make up a complete picture and so have the advantage of taking up much less data than the I frames. B frames enable MPEG-compressed video to be played in reverse. However, to see that original picture requires a whole sequence of MPEG-2 frames to be decoded.

Back Channel _ A means of communication from users to content providers. At the same time that content providers are transmitting interactive television (analog or digital) to users, users can connect through a back channel to a Web site-for example, for the original content provider or an advertiser. The back channel can be used to provide feedback, purchase goods and services, and so on. A simple type of back channel is an Internet connection using a modem.

Back Face cull _ The process of removing surfaces in an computer image that are not facing the viewer. Saves time in rendering process.

Back Porch _ The portion of the video waveform between the end of horizontal sync and the start of active video.

Backbone (Site or Server) _ A "strong" web site or server that is capable of processing and directing lots of traffic either on the Internet or within a Network. It performs a similar task to the CPU in a your computer and just like your backbone - has to be reliable!

Background _ a) Refers to the background of a key animated scene. **_ b)** The second image plane in video mixer panels is sometimes referred to as background.

Background Processing _ A secondary operation that is completed while the main operation continues uninterrupted. This requires an overhead in the machines" capabilities beyond that needed for their primary operation. This has particular benefits in pressured situations where time is short, or simply not available for extra operations - such as during edit sessions, live programming and transmission.

Background Rendering _ Background rendering systems may render sequences without requiring the full power of the computer. The user may continue processing his/her application while the computer renders in the background.

Back - timing _ Another expression for 3-point editing, i.e. marking of two out points and one in point, allowing the computer to match up the two out points and calculate the remaining in point.

Backup _ to copy files you wouldn't want to lose, onto another disk or other media. It's much safer to keep your backup disk(s) in another location and/or in a fireproof safe or safe-deposit. Doing regular backups won't help you much if you leave them in the same place as your main computer, and something happens there.

Balanced Audio Signals _ Signals that are carried on three-conductor cables, with two of the conductors carrying the same signal 180° out of phase and third as ground. Balanced connections usually cost more than unbalanced connections, but are less susceptible to picking up hum and interference with low-level signals. Also called "differential audio".

Bandpass Filter _ Filter that removes or attenuates frequencies above and below the frequency at which it is set. Frequencies within the band are emphasized. Band pass filters are often used in synthesizers as tone shaping elements. Often abbreviated to BPF.

Band Wipe _ Transition that produces the effect of displaying an incoming clip as alternating bands that eventually cover the outgoing clip.

Banding _ An artifact of color gradation in computer imaging, when graduated colors break into larger blocks of a single color, reducing the "smooth" look of a proper gradation.

Bandpass Filter _ A circuit that allows only a selected range of frequencies to pass through.

Bandwidth _ a) The amount of space a group of entertainers occupy on a stage. _ **b)** In audio and video, it is this band of frequencies (given in MHz) that can pass through a device without significant loss or distortion. The wider the bandwidth, the better the quality that results, such as a sharper picture or better sound. The higher the bandwidth number the better the performance. Digital image systems generally require large bandwidths hence the reason why many storage and transmission systems revert to compression techniques to accommodate the signal. _ **c)** It's also the amount of information that can be moved across a Network at any one time. It refers to the volume of transfer (usually in bits per second) and not the speed at which the information is transferred. Similar to the amount of water that can be carried by a pipe of a specific diameter.

Bank _ A storage location in a sampler or synthesizer that typically holds a large number of individual programs (sounds).

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

Barn Doors _ A term used in television production to describe the effect that occurs when a 4:3 image is viewed on a 16:9 screen. When this happens, viewers see black bars on the sides of the screen or "barn doors."

Base Memory _ The first 1MB of computer memory.

Baseband _ a) When applied to audio and video, baseband means an audio or video signal that is not modulated onto another carrier (such as RF modulated to channel 3 or 4 for example). In DTV, baseband also may refer to the basic (unmodulated) MPEG stream. _ **b)** A signaling technique in which the signal is transmitted in its original form and not changed by modulation. Local Area Networks as a whole, fall into two categories: baseband and broadband. Baseband networks are simpler and cheaper; the entire bandwidth of the LAN cable is used to transmit a single digital signal. In broadband networks, the capacity of the cable is divided into channels, which can transmit many simultaneous signals. Broadband networks may transmit a mixture of digital and analog signals, as will be the case in hybrid fiber/coax interactive cable television networks.

BASIC _ *Beginner's All-purpose Symbolic Instruction Code* - A computer language developed at Dartmouth College in the 1960s. Originally developed as an interactive, mainframe timesharing language, it has become widely used on small computers. BASIC is available in both compiler and interpreter form. As an interpreter, the language is conversational and can be debugged a line at a time. BASIC is also used as a quick calculator. BASIC is considered one of the easiest programming languages to learn. Simple programs can be quickly written on the fly.

Bass Reflex _ A type of loudspeaker that uses a port or duct to augment the low frequency response. Opinions vary widely over the best type of bass cabinet, but much has to do with how well a given design, such as a bass reflex, is implemented.

Batch Capture _ A feature of many video editing software packages. Batch capture allows you to specify a large amount of clips and their in and out points. When you are ready to capture, the video editing program will automatically capture all of the files you have selected.

Batch Digitizing _ If a great amount of original material exists, the material which has a higher compression factor or lower data rate is digitized in the non-linear cut and stored onto the hard disks connected. Although the image quality deteriorates because of the higher compression, it does, however, also require less hard disk capacity for storing the data. After finishing a rough version of the cut, material exists which is not used. The required hard disk capacity of the material to be used becomes smaller and it may be automatically re-digitized by means of batch digitizing at a lower compression rate (or higher data rate).

Batch List _ A list of clips to be batch captured.

Batch Processing _ Processing a group of transactions at one time. Transactions are collected and processed against the master files (master files updated) at the end of the day or some other time period.

Batch Scan _ the ability of a scanner to capture and process more than one image as a single operation.

Baud _ Named for J. M. E. Baudot, the inventor of the Baudot telegraph code A unit of signaling speed equal to the number of signal events per second. Baud is equivalent to bits per second in cases where each signal event represents exactly one bit. Often the term baud rate is used informally to mean baud, referring to the specified maximum rate of data transmission along an interconnection. Typically, the baud settings of two devices must match if the devices are to communicate with one another.

Bayer Pattern _ A filter pattern used for the matrix of a CCD or CMOS sensor chip in a digital still camera. More pixels are dedicated to green than to red and blue, because the human eye is more sensitive to that color. When only one array of sensors is used, the additional green pixels produce a better color image. In a three-chip digital video camera, the image is sent to three separate chips, one each for red, green and blue.

BBE Sound Enhancement _ Augments midrange sound frequencies, bringing presence and clarity to dialog and music tracks. Maintains the crisp highs of the original recording.

BBS _ *Bulletin Board Syste* - A computer system usually run by local users which makes files available for downloading and sets up electronic discussion notice-boards that all can access and contribute to.

BCD _ *Binary Coded Decimal* - A coding system in which each decimal digit from 0 to 9 is represented by four binary (0 or 1) digits.

BD _ *Block Difference*.

Beltware _ Electronic devices carried around the belt, including cellphones, PDAs and pagers.

Benchmark _ is a relative measure of the performance of a digital signal processor in a particular application.

Bending _ A video problem when the top of the screen hooks, bends or tears to the side.

Benign Virus _ A prank virus that does not cause damage. It does such things as randomly displaying a message on screen declaring "Peace on Earth" or causing the computer to make a clicking sound every time a key is pressed on some famous person's birthday. Fortunately, most viruses are benign.

Beowulf _ Using several smaller computers to provide the computing power of one large computer. A Beowulf cluster uses several off-the-shelf PCs connected via Ethernet to solve problems that would normally be handled by a supercomputer. Beowulf systems are designed for high speed, not redundancy. The first such system was developed by a contractor to NASA in the mid-1990s.

BER _ *Bit error rate* - A measure of the probability of bit error in a communication system.

Bernoulli Box _ A removable magnetic storage system.

Bessel Crossover _ A type of crossover design characterized by having a linear or maximally flat phase response. Linear phase response results in constant time-delay (all frequencies within the passband are delayed the same amount). Consequently the value of linear phase is it reproduces a near-perfect step response with no overshoot or ringing. The downside of the Bessel is a slow roll-off rate. The same circuit complexity in a Butterworth response rolls off much faster.

Beta / Beta Testing _ An advanced (pre-release) version of a new software package that is still being developed. A Beta version is often supplied to a selected group of testers for evaluation, criticism and bug testing. Their comments and observations are analyzed by the software manufacturers, changes are sometimes made then it is released to the general public.

Betacam _ An analogue component VTR system using a half-inch cassette. Developed by Sony, introduced in 1982 and is marketed by them and several other manufacturers. Betacam uses a variation of the Y, R-Y, B-Y analog component format. Luminance and color difference signals are transmitted and recorded staggeredly (time multiplex method). With this method, a significantly improved image quality may be achieved compared to for instance the S-VHS format.

Betacam SP _ An improved version of Betacam. Introduced by Sony in 1987, Betacam SP features superior picture quality and signal to noise ratio, a metal particle tape, and increased bandwidth.

Betacam SX _ Betacam SX is a digital recording system of Sony, which compresses the data according to the MPEG-2 - Studio standard (4:2:2: studio profile) by factor 10:1 and writes it onto tape at a video data rate of 18 Mbits/s. MPEG-2 enables higher compression factors at equal or improved image quality than other compression methods, owing to the fact that this method combines a plurality of frames when compressing video streams. The other systems, however, compress frame by frame. The formerly used Betacam SX devices may also reproduce analog Betacam SP tapes.

Betamax _ The Sony 1/2 Inch domestic video cassette format. Starting initially in November of 1975 Sony created an entirely new consumer electronics category - the home VCR - and ushered in a revolutionary way of distributing feature films. BetaMax was the first one to offer certain functions that we nowadays take as granted - they provided first HiFi videos, first "tape remaining" counters, peek search, Automatic Program Search (in VHS systems nowadays called as "indexing"), etc... BetaMax also had better resolution than rival formats, because it used more tape for each second than other formats. This was also the flaw that eventually gave VHS the winning edge Also developed in Super Beta and Enhanced Definition (ED) Beta (With the metal tape). Sony Tokyo officially announced that they were ceasing production of Betamax VCRs at the end of 2002.

Bézier Curve _ A mathematically defined curve made up of four points, two ends and two in between, that affect its shape. Used in various graphic software,

B-frame _ *Bi-directional frame* A frame created during the MPEG or MPEG-2 IBP compression process. A B-frame is generated by forwards and backwards referencing of the P-frames and I-frames respectively, which allows it to have the highest compression ratio of the three frame types. B-frames contain only predictive data (that is, not enough data to make up an entire picture), and therefore cannot be edited independently.

BGA _ The *Ball-Grid Array* (BGA) is a method of LSI packaging in which connector pins are placed on the solder dome on the bottom surface of the LSI chip. The dome is attached to the circuit board by applying heat and pressure. The use of BGA makes it possible to package an LSI with multiple connector pins within compact dimensions.

Bi-amplify _ The use of two amplifiers, one for the lows, one for the highs. Could be built into the speaker design or accomplished with the use of external amplifiers and electronic crossovers.

Bias _ High frequency signal used in analog recording to improve the accuracy of the recorded signal and to drive the erase head. Bias is generated by a bias oscillator.

BiCMOS _ BiCMOS combines CMOS and (ECL) Bipolar transistors to form both logic devices and memory devices on the same chip

Bi-cubic Interpolation _ A Matrix for comparison of central pixels to surrounding pixels.

Bi-directional _ When signals can pass in either direction through the same port or by the same path. RS-232 communications is bi-directional because the devices at either end can transmit and receive. Conversely, a device connected to an output can send a signal to a device connected to an input.

BIFS _ Binary format for scenes. In MPEG-4, a set of elements called nodes that describe the layout of a multimedia layout BIFS-Update streams update the scene in time, BIFS-Anim streams animate the stream in time. BIFS are organized in a tree-lined hierarchical scene graph node structure derived from VRML.

Bilinear Filtering _ Bilinear filtering is a method of anti-aliasing texture maps. A texture-aliening artifact occurs due to sampling on a finite pixel grid. Point-sampled telexes jump from one pixel to another at random times. This aliening is very noticeable on slowly rotating or moving polygons. The texture image jumps and shears along pixel boundaries. To eliminate this problem, bilinear filtering takes a weighted average of four adjacent texture pixels to create a single telex.

Bi-linear Interpolation _ A texture display mode used to minimize aliasing. It produces a single value by averaging the values of the four texels nearest the texture coordinate.

Bin _ A location for storing and organizing clips in some of the non-linear editing software.

Binary _ Mathematical representation of a number to base 2, i.e. with only two states, 1 and 0; on and off; or high and low . This is the base of the mathematics used in digital systems and computing. Binary representation requires a greater number of digits than the base 10, or decimal, system most of us commonly use everyday. For example, the base 10 number 254 is 11111110 in binary. The result of a binary multiplication contains the sum of digits of the original numbers. So: 10101111 x 11010100 = 1001000011101100 (in decimal 175 x 212 = 37,100) Each digit is known as a bit. This example multiplies two 8-bit numbers and the result is always a 16-bit number.

Binary Compatible _ Refers to any data, hardware or software structure (data file, machine code, instruction set, etc.) in binary form that is 100% identical to another. With regard to executable programs, it means that they can run without change in a different or upgraded hardware platform (CPU).

Binary File _ A file that uses all eight bits of the byte. Machine language programs (executable programs), graphics files, databases, spreadsheets and most word processing files fall into this category. Almost all files except for simple ASCII text files are binary files. The distinction is meaningful when transmitting mail over the Internet. SMTP (Simple Mail Transfer Protocol) supports ASCII characters, which use only seven bits. When binary files are attached to e-mail messages, they must be converted into a 7-bit temporary text format, such as MIME, UU-coding or BinHex, and restored to their original 8-bit format at the receiving end. Full-blown e-mail programs (not light versions) support the popular encoding methods.

Binary Image _ A digital image composed of pixels with a single bit value of 0(dark) or 1 (bright).

Binary Search Tree _ A way of organizing data for easy search and lookup. At each intermediate node of the tree, a search for a particular element is either successful or it is directed to either the subtree to its left or the subtree to its right. In this way, large amounts of information is eliminated from the search at each step, making efficient searches possible. Binary search trees find many important applications including problem state space searches in artificial intelligence problems, creating indexed files in databases, and constructing spell checkers for word processing software packages.

Binary Space Partition (**BSP)** _ a type of tree data structure which divides a region of space into convex hulls by hyperplanes. It is used in 3D computer games, particularly first-person shooters. One of the earliest games to use a BSP data structure was Doom.

Bionic _ A machine that is patterned after principles found in humans or nature; for example, robots. It also refers to artificial devices implanted into humans replacing or extending normal human functions.

Bios _ *Basic Input Output System* - The internal computer chip that manages communications between the computer and peripherals. It helps the computer think and remember what devices to use, how to communicate with the monitor, keyboard and hard drive, and what day it is, etc.

B-ISDN _ *Broadband integrated services digital network* - A special version of ISDN that uses fiber optics and can transfer at 1.5 megabits per second.

Bit _ An abbreviation for a binary digit which can be either 0 or 1. A bit is the basic data unit of all digital computers. It is usually part of a data byte, or data Word; however, a single bit can be used to control or read logic ON/OFF functions. A bit is a single digit in a binary number. Bits are the basic unit of information capacity on a computer storage device. Eight bits equal one byte. Digital images are often described by the number of bits used to represent each pixel. i.e. a 1-bit image is monochrome; an 8-bit image supports 256 colors or grayscales; while 24 or 32-bit supports true color. However MIDI devices use a 10 bit byte that includes a start bit, the 8-bit data message, and a stop bit.

Bit Bucket _ Any device capable of storing digital data - whether it be video, audio or other types of data.

Bit Budget _ The total amount of bits available on the media being used. In DVD, the bit budget of a single sided/single layer DVD5 disk is actually 4.7 GB.

Bit Density _ Expressed as bits per inch (BPI), the number of bits that can be written onto one inch of track on a disk surface.

Bit Depth _ In digital graphics, bit depth indicates the number of colors the image can display. A high contrast (no grey tones) black and white image is 1-bit, meaning it can be off or on, black or white. As bit depth increases, more colors become available. 24-bit color allows for millions of colors to be displayed. Similarly, in digital audio, bit depth indicates the number of bits per sample; the higher the number, the better the sound quality.

Bit Planes _ The number of bits dedicated to storing information about the pixels of a graphics object or scene. Sometimes referred to as the color depth of the storage scheme.

Bit Rate _ The amount of data transported in a given amount of time, usually defined in Mega (Million) bits per second (Mbps). Very often used when speaking of video or audio quality - defines how much physical space one second of audio or video takes in bits. _ **a)** Bit rate is one means used to define the amount of compression used on a video signal. Uncompressed D1 has a bit rate of 270 Mbps, DV is 25 Mbps, etc. _ **b)** In a digital network, the number of bits that pass a given point, in a given amount of time, usually a second. _ **c)** While the term "bit rate" is a synonym for **data transfer rate** (aka **data rate)**, bit rate seems to be used more often when referring to telecommunications transmission technology, and data transfer rate (or data rate) is used more often when referring to computing systems.

Bit Resolution _ or bit depth: the number of bits of data stored per pixel. Common values of this resolution of ranges are 1 to 32 bits per pixel.

Bit Serial _ Transmission of digital video a bit at a time down a single conductor such as coaxial cable. May also be sent through fiber optics.

Bit Slippage _ a) Occurs when word framing is lost in a serial signal so that the relative value of a bit is incorrect. This is generally reset at the next serial signal. _ **b)** The erroneous reading of a serial bit stream when the recovered clock phase drifts enough to miss a bit. _ **c)** A phenomenon that occurs in parallel digital data buses when one or more bits get out of time in relation to the rest. The result is erroneous data. Differing cable lengths is the most common cause.

BitBLTs _ The BitBLT is the single most important acceleration function for windowed GUI environments. A BitBLT is simply the movement of a block of data from one place to another, taking into account the special requirements and arrangements of the graphics memory.

BITC _ *Burned-In Time Code* - Timecode that is displayed on the video to which it refers. This is often recorded to provide precise frame references for those viewing on equipment not supplied with timecode readers - such as domestic VCRs.

Bitmap _ A method of graphic display using rows and columns of dots, or pixels. Each pixel location corresponds to a location in memory. There are many bitmapped file formats, .bmp, .pcx, .pict, tiff, .tif, .gif, and so on. Also known as raster, bitmap data comprises a set of binary values specifying the color of individual pixels that make up an image. Bitmap data is characterized by resolution and bit depth. Resolution relates to the detail in an image, and is expressed in dots per inch (dpi) or pixels per inch (ppi). The higher the resolution (i.e., the more dots used to describe the image), the more detail possible. Bit depth defines the number of colors the image can display. A high-contrast (no grey tones) black and white image is 1-bit, meaning it can be off or on, black or white. As bit depth increases, more colors become available: For image detail and quality, bit depth is as important as resolution, since the bit depth determines the colors available in the palette. When fewer colors are available, areas that may have shown a subtle shift of tones and hues are rendered instead as single blocks of solid color, eliminating image detail. Bitmap data is indispensable for continuous tone images, such as scanned or digital photographs, and for anti-aliased images. However, bitmap data is consistently larger than vector data. Each pixel in a bitmap image has to be defined. A relatively small 150-pixel x 150-pixel graphic requires 22,500 discrete bits of information plus the palette, or color lookup table (CLUT), that is usually included.

Bit-mapped Graphic _ Description used to describe an image that is formed in a map form instead of a mathematical form. The image is created by placing dots (or bits) in a row or column forming an image with several thousand small dots or bits to make the complete image. A bit-mapped image when enlarged will have jaggies.

Bitstream _ Refers to a stream of bits transmitted over a communications line between two devices.

Bi-wiring _ The use of two pairs of speaker wire from the same amplifier to separate bass and treble inputs on the speaker.

Black & White _ Monochrome or luminance information. Monochrome means one color. In the color television system the Black & White portion of the picture has to be one "color"; gray. The black and white signal in the S or Component video path is separate from the color information.

Black _ The darkest visible surface; created by the absorption of all incident light and color. In video, the transmission of horizontal and vertical sync signals without picture information.

Black Box _ A term used to describe a piece of equipment dedicated to one specific function, also called dedicated hardware.

Black Burst _ The video waveform without the video elements. It includes the vertical sync, horizontal sync and the chroma burst information. Black burst is used to synchronize video equipment to align the video output. One signal is normally used to setup an entire video system, or facility. Sometimes it is called "house sync".

Black Burst Generator _ A special device for calibrating video equipment by generating a composite video signal with a totally black picture. This black burst signal is used to synchronize video equipment to provide vertical interval switching. It also provides black level and chroma burst information for maintaining uniform video levels and color information.

Black Generation _ When converting an RGB image to CMYK color mode, black generation refers to the values that are generated for the black plate used in commercial printing.

Black Level _ That portion of a video signal which determines pure black in the video image.

Black Level Expansion _ Dynamically boosts the black level in the dark areas of the picture according to picture content. Increases shadow detail without compromising overall picture contrast.

Black Noise _ Is also know as Dark Current, is the signal charge the pixel develops in the absence of light. This charge is temperature sensitive, and normal in electrical image sensing devices.

Black Point _ This is the color that produces color values of 0, 0, 0 for each of the RGB components when scanned or digitized. Normally, the black point is 0 percent neutral reflectance or transmittance.

Blanding _ Stair-stepping of shades in a gradient or on the blend.

Blank Tape Skip _ Automatically skips sections of blank tape for uninterrupted auto reverse playback.

Blanking _ The portions of a video signal that turn off, or black, when a camera or receiver complete a scan line or field prior to retracing to begin the next scan. The interval when the beam completes a scan line it must return (retrace) back to the left. During this time, the beam must be turned off (horizontal blanking). Similarly, when the last line has been scanned at the bottom of the screen, the beam must return to the upper left. This requires vertical blanking.

Bleeding _ The color value of one pixel unintentionally appearing in the adjacent pixel or pixels.

Blending _ Blending is the combining of two or more objects by adding them on a pixel-by-pixel basis.

Bloatware _ Software that is so overloaded with functionality that its performance suffers. At the very least, it takes a long time to load the program. Software vendors seem to have the perception that more is always better.

BLOB _ *Binary Large Object* - A database field that holds any digitized information, including text, images, audio or video. Also known simply as a "large object" or LOB, a BLOB may have a huge storage capacity.

Block _ **a)** A group of bytes handled, stored, and accessed as a logical data unit, such as an individual file record. A block in computer environment is the smallest contiguous area that can be allocated for the storage of data. _ **b)** Rectangular area of picture, usually 8 x 8 pixels in size, which are individually subjected to DCT coding (used also in MPEG) as part of a digital picture compression process. Artifact of compression generally showing momentarily as misplaced rectangular areas of

picture with distinct boundaries. This is one of the major defects of digital compression, its visibility generally depending on the amount of compression used, the quality of the original signal, and the quality of the coder. The visible blocks may be 8 x 8 DCT blocks or "misplaced blocks" - 16 x 16 pixel macroblocks, due to the failure of motion prediction/estimation in encoder or other motion vector system, such as a standards converter.

Blooming _ a) The appearance of a bright or colored halo around bright areas of a digital image. Blooming is caused when a portion of the CCD in a digital camera is exposed to too much light and the signal "leaks" to the neighboring pixels. _ **b)** Most noticeable at the edges of images on a CRT, "blooming" is when the light hitting the screen is too intense and overdrives the phosphors. The edges of an image seem to exceed its boundaries. Thin lines and sharp edges may look thick and fuzzy. This may be caused by the brightness being set too high, or by a high voltage problem.

Blue Book _ The official specification for session 2 of a CD EXTRA or Enhanced CD. Includes a file structure for graphics, lyrics, biographies and copyright.

Blue Diode Laser _ A semiconductor laser that emits in the 400-450 nm range. It has been exceedingly more difficult to develop blue lasers than other colors with larger wavelengths. Blue diode lasers will allow for smaller pits to be used in optical discs (CD-ROMs use 780 nm pits; DVDs are 630 nm). Blue LEDs (a related technology) are expected to be used in display screens in the future.

Blue Screen _ a) Often referred to as the *"Blue Screen of Death"*. It's the blue screen that Windows generates every time your computer is just about to crash. It contains white text on a blue background. _ **b)** Video editing technique used to combine a subject with a background shot separately. The subject is shot against a solid blue (or sometimes green) color screen. The blue color can be selected on a frame-by-frame basis, through the use of a video editing system. A matte can then be generated to isolate the subject, in order to composite it onto the desired still or motion background clip.

Blue Tooth _ The new wireless standard for connecting cameras, PDAs, laptops, computers and cell phones. Uses very high frequency radio waves. Bluetooth provides up to 720 Kbps data transfer within a range of 10 meters and up to 100 meters with a power boost. Unlike IrDA, which requires that devices be aimed at each other (line of sight), Bluetooth uses omnidirectional radio waves that can transmit through walls and other non-metal barriers. If there is interference from other devices, the transmission does not stop, but its speed is downgraded. The name Bluetooth comes from *King Harald Blatan* (Bluetooth) of Denmark. In the 10th century, he began to Christianize the country. *Ericsson* was the first to develop this specification.

Blur _ The art of softening the detail of a digital image. The process can be applied selectively to portions of an image.

Blu-ray Disc _ Blu-ray, also known as Blu-ray Disc (BD) is the name of a next-generation optical disc video recording format jointly developed by nine leading consumer electronics companies (Hitachi, LG, Matsushita (Panasonic), Pioneer, Philips, Samsung, Sharp, Sony, and Thomson). The format was developed to enable recording, rewriting and playback of high-definition video (HDTV). Blu-ray makes it possible to record over 2 hours of digital high-definition video (HDTV) or more than 13 hours of standard-definition video (SDTV/VHS picture quality) on a 27GB disc. There are also plans for higher capacity discs that are expected to hold up to 50GB of data. While current optical disc technologies such as CD, DVD, DVD-R, DVD+R, DVD-RW and DVD+RW use a red laser to read and write data, the new format uses a blue laser instead, hence the name Blu-ray. The benefit of using a blue laser is that it has a shorter wavelength (405 nanometer) than a red laser (650 nanometer), which means that it's possible to focus the laser beam with even greater precision. This allows data to be packed more tightly on the disc and makes it possible to fit more data on the same size disc. Despite the different type of lasers used, Blu-ray Disc Recorders will be made compatible with current red-laser technologies and allow playback of CDs and DVDs. As more and more people upgrade to HDTV to enjoy the benefits of digital television (DTV), the need for recording high definition content will rise. Blu-ray was designed with this in mind and uses the same MPEG-2 compres-

sion standard as DTV, so it is highly compatible with the global standard for digital broadcasting. To handle the increased amount of data required for high-definition video, Blu-ray employs a 36Mbps data transfer rate, which is more than enough to record and playback digital high-definition broadcasts while maintaining the original picture quality. In addition, by fully utilizing an optical disc's random accessing features, it's possible to playback pre-recorded video on a disc while simultaneously recording high-definition video being broadcast on TV.

BMP _ *Bitmap file* **_ a)** A not compressed graphic format. The method of storing information that maps an image pixel, bit by bit. **_ b)** A file type that's available in most Windows based graphical applications. A .bmp file can be quite a large one and usually contains up to 256 colors. The BMP format supports RGB, indexed-color, grayscale, and Bitmap color modes.

Board _ a layered flat rectangle, mostly of plastic, with circuitry printed into it, and chips and their supporting electronic bits and pieces soldered onto it. With micro electronics, boards are seldom repaired, but are completely replaced if there is a problem, since working on the very delicate and complicated circuit through all those layers and tiny attached pieces is beyond normal human hand skills. The "motherboard" usually has the main processor on it; a "daughterboard" is an add-on for a specific reason.

Body _ In E-mail terms it means the part of the message containing the text content. The term Body is also used in Web page design where it refers to the html code hidden within the <body> tags of a Web Page.

Body-worn Computer _ A computer that is worn on the body and accessed via voice recognition and a head mounted display (HM_ D). The computer is a full PC with hard disk that is ruggedized for the natural abuse it will receive in the work environment. The HMD is worn like goggles and gives the illusion of a floating monitor in front of the user's face.

BogoMips _ *Bogus Millions of Instructions Per Second* - An approximate measurement of processor performance developed by Linus Tornados, Linux's creator. When Linux is booted, it calculates a timing loop based on the processor it is running in. This data provides a rating of speed that is considered useful, but not 100% scientific for comparing different CPUs, since there are other contributing factors to performance.

Bones _ Bones is jargon for an internal skeleton used for animating models. The model deforms based on the movement of the bones inside it.

Bookmark _ Virtual bookmarks work pretty much the same as the real ones you use in your favorite novel. They record a URL or Web page to allow you to refer back to it at a later date. Bookmarks are also used to link one area (or subject) on a Web page to another one (usually on the same page) by using a hypertext link (funny little hand). We often use Bookmarks to link the Title Headings on our pages to sections of relevant text within that page.

Boolean Expressions _ Logical expressions which evaluate to either true or false. Any term such as AND, OR, NOT and NEAR (if typed in-between two other words in a search enquiry) will narrow down the search to a specific area of interest. When used in this context, these words are known as Boolean. Named for mid-19th century English logician George Boole.

Boolean Operations _ In regard to 3D modeling, there are three primary operations: addition, subtraction, and intersection. In order to create a boolean object, you first need two other objects. They can be primitives or other meshes. They also need to intersect in 3D space. If you do addition, the resulting object will be the sum of the two initial objects. It will look as if the two were welded. If subtraction is what you are doing, the second object get subtracted from the first one. A hole in the shape of the second object is created in the first one. All the space that was occupied by both of the objects is taken away from the first one. Finally, in the intersection mode, the final object occupies the area in which both of the initial intersected.

Boomy _ Listening term, refers to an excessive bass response that has one or more peaks in it.

Boost/cut control _ A single control which allows the range of frequencies passing through a filter to be either amplified or attenuated. The centre position is usually the flat or no effect position.

Boot up _ To start up. Most computers contain a system operating program that they read out of memory and operate from after power up or restart. The process of reading and running that program is called boot up.

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

Boss _ In the world of video games, boss is the enemy at the end of a level that a player must defeat to continue to the next stage. Typically, bosses are more graphically elaborate and difficult to defeat than other intra-level enemies.

Bot _ A bot is a computer-controlled video game player that is designed to behave like a human player. They are implemented by gamers through multiplayer selection screens when it's inconvenient, or not possible to play against an actual human opponent. Bots use AI routines to simulate human actions, but they generally lack in the strategy department.

Bottleneck _ A lessening of throughput. It often refers to networks that are overloaded, which is caused by the inability of the hardware and transmission lines to support the traffic. It can also refer to a mismatch inside the computer where slower-speed peripheral buses and devices prevent the CPU from being used to its fullest capacity.

Bouncing _ The process of mixing two or more recorded tracks and re-recording these on to another track.

Bow _ The curving of scan lines in the center of the image.

BPI _ Bits per inch. Indicates the density of information on a hard drive.

Bpp _ Bits per pixel (picture element or pel).

BPS _ *Bits Per Second* - The speed at which data transfer is measured. A 56k modem transfers at up to 56 kbps over a non digital (i.e. analogue) phone line.

Breakaway _ The ability to separate audio and video signals for switching them independently. For example: the audio and video signals from one source may "break away" and be switched to two different destinations.

This is the opposite of "audio follow".

Breakout Box _ An external hardware device used to connect an analog video source to a video capture card installed in a computer.

Breath Controller _ Device that converts breath pressure into MIDI controller data.

Breezeway _ The early part of the back porch portion of the video signal. The area between the horizontal sync pulse and the color burst.

Bridge _ A means of connecting communications networks at more than one site.

Bridgeware _ Hardware or software that converts data or translates programs from one format into another.

Brightness _ a) One of the three dimensions of color (HS_ B). Brightness is the relative lightness or darkness of a color from 0% black to 100% white. **_ b)** The attribute of visual perception in accordance with which an area appears to emit more of less light. Luminance is the recommended name for the photo-electric quantity which has also been called brightness.

Broadband _ An all-inclusive term referring to the bandwidth of high-speed connections to the Internet. There is no set connection speed to define when "broadband" begins and normal connections end. Once a bandwidth connection rivals the 128Kbps usually associated with ISDN, a connection is typically defined as "broadband."

Broadband Transmission _ Broadband transmission carries multiple signals on a single transmission line or channel. The bandwidth of the channel is divided into separate subchannels or frequency bands each capable of carrying a signal. Contrast with baseband transmission.

Broadcast FTP Protocol (BFTP) _ A one-way IP multicast based resource transfer protocol, the unidirectional Broadcast File Transfer Protocol is a simple, robust, one-way resource transfer protocol that is designed to efficiently deliver data in a one-way broadcast-only environment. This transfer protocol is appropriate for IP multicast over television vertical blanking interval, in IP multicast carried in MPEG-2, like with the DVB multiprotocol encapsulation, or in other unidirectional transport systems. It delivers constant bitrate services or opportunistic services, depending on the characteristics and features of the transport stream multiplexor or VBI insertion device.

Broadcast Quality _ Although the expression broadcast quality is frequently used, a fixed definition does not exist. Generally accepted measurable variables do not exist. Usually (at least until recently) the tape format Betacam SP was selected as reference point: Broadcast quality usually describes the picture quality that the user subjectively considers as being equal to the Betacam SP picture quality. Also non-linear editing does not include any fixed measured variables to determine the broadcast quality. As a rule, video boards and editing systems with a compression rate (approx. 1:2) as low as possible or a data rate of approx. 50 Mbits/s are understood by this.

Broadcasting _ Transmitting the same information to many different receivers. The receiver is a passive participant in this form of communication and cannot interact with the information being delivered.

Brook's law _ "Adding manpower to a late software project makes it later." By *Fred Brooks*, author of "The Mythical Man-Month."

Browse _ Method used with some still stores, graphics systems and disk-based video stores to display a selection of reduced size or reduced resolution images to aid choice of stored clips or stills. For moving video a timeline may be available so clips can be shuttled allowing the full sized images to be brought to use pre-cued. Browse/edit facilities are used in newsroom systems to provide low resolution video editing for journalists on their desktops. The material is stored on a browse server and distributed over a network to the many users. Details differ between models but some allow frame-accurate shot selections to be made with the resulting "cuts decision lists" used for conforming a broadcast quality version.

Browser _ Often called a Web Browser. This allows the user to navigate the Web and other Internet facilities using a Graphical User Interface. The browser is responsible for interpreting for display on the local machine information transferred in HTTP (HyperText Transfer Protocol) format from a Web server machine over the network. Two of the most popular browsers are Netscape Navigator and Microsoft Explorer.

Brush _ Tool used in creating images with a drawing program. Generally the brush is similar to a paint brush, capable of having bold or vivid strokes capable of filling a large area quickly when compared to other tools such as the pencil.

BTOR _ *Blank Tape Optimized Recording* automatically shuts off the erase head's currency when recording on to a blank tape, thereby greatly reducing noise and distortion.

Bubble _ A bit in bubble memory or a symbol in a bubble chart.

Bubble Memory _ A solid state semiconductor and magnetic storage device suited for rugged applications. It is about as fast as a slow hard disk and holds its content without power. It is conceptually a stationary disk with spinning bits. The unit, only a couple of square inches in size, contains a thin film magnetic recording layer. Globular-shaped bubbles (bits) are electromagnetically generated in circular strings inside this layer. In order to read or write the bubbles, they are rotated past the equivalent of a read/write head.

Buffer _ A temporary storage area usually held in RAM. The purpose of a buffer is to act as a temporary holding area for data that will allow the CPU to manipulate data before transferring it to a device.

Buffer Bandwidth _ The speed of transferring data to or from the buffer.

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

Buffering _ Similar to caching, buffering is the process by which streaming media that is entering the user's computer at a faster rate than can be played, is saved as memory without backing up or overloading the Player. Buffering is what computer does to play streaming video. Since video files are far too large to download all at once and play in real time, the computer will download small parts of the video, a little at a time. This is called "buffering" and is a process which allows the video to play smoothly - downloading in small segments while the system catches up.

Bug _ An error in a computer program that causes the system to behave erratically, incorrectly or to stop altogether. Term dates from the original computers with tubes and relays, where real live bugs were attracted by the heat and light and used to get between the relay contacts. Today, however, a bug is software behavior that you don't want! Programmers will sometimes say that a bug is just a feature people don't appreciate... but we know when something is not working properly, not doing what the program says it can do (or worse, crashing the computer!) Nowadays a lot of software is released to the general public without rigorous testing, so bugs showing up in software performance is not uncommon.

Bugrade _ *Bug Upgrade* - A software upgrade that fixes bugs more than it adds functionality. Although new features are touted, the upgrade is purchased to eliminate headaches in the prior version

Bulk Dump _ A MIDI function that allow the transfer of system specific data, such as sample files or mixer settings, between MIDI capable devices. The data is transmitted as MIDI System Exclusive messages.

Bump Mapping _ In computer graphics, a technique for simulating rough textures by creating irregularities in shading.

Bump-up _ Copying from one recording medium onto another that is more suitable for post-production purposes because, for example, it offers better bandwidth or timecode capabilities.

Bundling _ Combining two or more different functions into one expansion board or peripheral device. Also combining software "bundled" with hardware.

Burn _ **a)** A technique used to darken areas of a photograph. _ **b)** Blemishes or spots on camera tubes caused by pointing the camera at very bright lights or the sun. _ **c)** In video display, this is a term to describe what happens when an image has been displaying too long in the same place, resulting in a permanent image being "burned in" to the screen phosphor _ **d)** To record information onto a rewritable optical medium such as a CD-R, CD-RW or DVD+RW.

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.

Bus _ **a)** A bus is a transfer line for moving data. The most important bus in a computer system is the bus between the CPU and RAM. The bandwidth of this bus is an important parameter in the performance capabilities of the computer. The first microcomputers, introduced around 20 years ago, had a bus bandwidth of 8-bits, and until recently the most common width was 16 bits. However, most microcomputers today have a 32-bit bandwidth (and are referred to as 32-bit computers) while 64-bit is just around the corner. Common bus systems in the PC field are: ISA, EISA and PCI. _ **b)** One complete channel of a video or audio system. Frequently used in switchers and Special Effects Generators. In an audio mixer there are several busses carrying the stereo mix, the groups, the PFL signal, the Aux sends and so on. Power supplies are also fed along busses.

Bus Mastering _ A feature of PCI buses that allows a card with this feature to retrieve data directly from system memory without any interaction with the host CPU

BWF _ *Broadcast WAV file* - the standard audio file format in the PC digital-audio world, based on Microsoft's WAV, which can be read by any MAC/OS or WINTEL machine. It can carry PCM or MPEG encoded audio and adds the metadata, such as a description, originator, date and coding history, needed for interchange between broadcasters. The EBU Broadcast Wave Format (BWF) adds a chunk that contains the sequence description and the date & time of recording

B-Y _ Color difference signal of one of the analog component signals. It is created by subtraction of the luminance value (Y) from the blue contribution of a pixel. The color difference signal B-Y includes information regarding chrominance and saturation.

Byte _ *Binary Table* Abbreviation for binary term, a unit of storage capable of holding a single character. On almost all modern computers, a byte is equal to 8 bits. Large amounts of memory are indicated in terms of kilobytes (1,024 bytes), megabytes (1,048, 576 bytes), and gigabytes (1,073,741,824 bytes). A disk that can hold 1.44 megabytes, for example, is capable of storing approximately 1.4 million.

Byte Aligned _ A bit in a coded bitstream is byte-aligned if its position is a multiple of 8 bits from the first bit in the stream.

Byte Order _ The numeric arrangement of bytes in a word, which is the basic unit of storage in a computer (words are 8, 16, 32 and 64 bits long). "Big endian" is the normal order and the way humans deal with arithmetic: the most significant byte or digits are placed leftmost in the structure. Some CPUs, most notably Intel CPUs, deal with words in "little endian" order, which is the reverse and places the least significant digits on the left. Since numbers are calculated by the CPU starting with the least significant digits, little endian numbers are already set up in the required processing order.

Byte Serving _ Also called "page on demand," it is the ability to retrieve a specific page or set of pages rather than the entire document. For example, if the Web server and browser support byte serving, Acrobat files (PDF files) can be viewed as soon as the first couple of pages have been downloaded. The remainder of the file is retrieved in the background.

Byte Specifications _ The primary specifications of hardware are rated in bytes; for example, a 40-megabyte (40M or 40MB) disk holds 40 million characters of instructions and data. A one-megabyte (1M or 1MB) memory allows one million characters of instructions and data to be stored internally for processing. With database files and word processing documents, the file size is slightly larger than the number of data characters stored in it. Word processing files contain embedded codes for layout settings (margins, tabs, boldface); therefore, a 100,000-byte document implies slightly less than 100,000 characters of text (approx. 30 pages). Database files contain codes that describe the data fields within the records, thus, a 100,000-byte database file holds less than 100,000 characters of data. Unlike data and text, a 100,000-byte graphics file is not indicative of the size of the image contained within. A 100,000 byte vector graphics file may render a very detailed and elaborate drawing, while a 100,000-byte bitmap file would be considerably smaller. Depending on the format, compression method and number of colors used, bitmapped images can range from a few thousand bytes up into the millions.

C

C _ a) High-level computer language which is used for many of today's graphics programs and for programming UNIX systems. **_ b)** In S-video, "C" is an abbreviation for **chroma**, or color information. ("Y" is for luma, or the brightness.)

C/N (also CNR) _ *Carrier-to-noise ratio*.

C/N Threshold _ The C/N at threshold of visibility (TOV) for random noise.

CA _ *Conditional Access* - A mechanism by which the user access to service components can be restricted.

Cable Internet _ Internet access via cable TV. There are two kinds of service. One uses a cable modem to connect to a computer, and the other uses an enhanced cable box that provides Internet access directly at the TV. Both of these differ from MSN TV, which requires a phone line.

Cable Modem _ A data modem that uses the bandwidth of a given cable system, which promise speeds of up to 80 times faster than an ISDN line or six times faster than a dedicated T1 line (the type of connection most large corporations use). Because cable modems provide Internet access over cable TV networks (which rely primarily on fiber optic or coaxial cable), they are much faster than modems that use phone lines. Bandwidths are typically up to 30 Mbps in the downstream direction.

Cache _ literally a hiding place (from French: cacher, to hide) **_ a)** High-speed RAM used as a buffer between the CPU and a hard drive. The cache retains recently accessed information to speed up subsequent accesses to the same data. When data is read from or written to disk, a copy is saved in the cache, along with the associated disk address. The cache monitors the addresses of subsequent read operations to see if the required data is already in the cache. If it is, the drive returns the data immediately. If it is not in the cache, then it is fetched from the disk and saved in the cache. **_ b)** your ISP's proxy server is a local (close to you) and much larger cache, working in the same way. **_ c)** memory cache - (level 1 = built into the processor, or level 2 = added onto the motherboard) is an amount of higher-quality and thus faster RAM available to the processor.

Cached Files _ Copies of Web pages you've looked at are all stored here.

CAD _ C*omputer-Aided Design* - CAD programs for engineering, architecture, integrated circuits and graphics design save considerable time over conventional methods.

Caddy _ The plastic and metal carrier into which a CD must be inserted before it is loaded into some CD-ROM drives or CD-Recorders. Others have a tray that slides out to receive the CD, and do not need caddies.

Caffeine Based _ Any program written in Java.

Calibration _ The act of adjusting the color of one device relative to another, such as a monitor to a printer, or a scanner to a film recorder. Or, it may be the process of adjusting the color of one device to some established standard.

Calibration Bars _ An 11-step grayscale in 10% increments from 0% to 100% used in calibration.

Cam _ specific method how movie pirates create illegal bootleg copies of original movies. Cam method is basically just a guy who uses either regular or professional camcorder to shoot the movie either from TV or actually inside a movie theatre *(in some Cam copies of movies you can actually see audience as well)*. These bootleg copies are normally then encoded into VCD, SVCD or DivX format and distributed illegally over the Internet.

Camcorder _ A video camera, i.e., a device that records continuous pictures and generates a signal for display or recording. To avoid confusion, it is recommended that the term "camcorder" be used rather than "camera" - in contrast, a digital camera records *still* images, while a digital camcorder records *continuous video* images.

Camping _ In a multiplayer video game (usually a first-person shooter), camping is the practice of finding an easily defended spot and staying there, killing other players as they appear. One of these spots might be a corner or a high platform with a wall guarding your back, for sniping. Camping is a universally reviled practice and considered unskillful.

Canvas _ The entire image displayed on the monitor, but not necessarily at full resolution.

Capacitance _ Property of an electrical component able to store electrostatic charge.

Capacitor _ Electrical component exhibiting capacitance. Capacitor microphones are often abbreviated to capacitors. On a computer motherboard, discrete ceramic and tantalum capacitors surround the CPU chip.

Capacitor Microphone _ Microphone that operates on the principle of measuring the change in electrical charge across a capacitor where one of the electrodes is a thin conductive membrane that flexes in response to sound pressure.

Capacity _ The amount of information, measured in bytes, that can be stored on a hard drive. Also known as Storage capacity.

Capstan _ The roller in the VTR that governs the speed of the tape transport.

Capture _ If the source footage is analog, "capture" refers to the act of digitization (conversion to a digital format) to make the video usable on a computer and, usually, the simultaneous application of compression to reduce the video to a manageable data rate for processing and storage. If the source video is digital, "capture" typically refers to the simple transfer of video from an external device, such as a digital camcorder or tape deck, to a computer hard drive.

Capture Buffer _ A reserved memory area for holding an incoming transmission.

Capture Card, Video _ When video sequences are captured, the storage requirements are very high. Data must be digitized and stored rapidly to capture the necessary number of still images per second to simulate continuous motion upon playback. This is accomplished by special hardware (video cards) on most computers. The video card converts an incoming analogue video signal (from a video camera, VCR, or other similar device) to digital form, and usually compresses the data as well, before sending it to the computer's RAM or an attached hard drive. Or, for video that is already digitized, the device that simply transfers the file to the hard disk. Using a hardware or software codec, the capture card also compresses video in and decompresses video out for display on a television monitor.

Capture Rate _ Used to describe the number of times per second that a picture is taken or captured in an imaging system. In a progressive system the capture rate is equal to the frame rate. In an interlaced system, the capture rate is double the frame rate because at each capture interval, only one field (a half resolution image) is acquired. It takes two fields to make a complete frame. It is standard practice to refer to the capture rate of an image as well as how it is captured when describing it instead of the frame rate (i.e. 60i (60 captures, 30 frames per second), 30P (30 captures, 30 frames per second) and 60P (60 captures, 60 frames per second))

Card _ Memory chip that can be used to store images and data. Various forms currently exist, the most popular of which are SmartMedia, Memory Stick and Compact-Flash.

Card Bus _ This is the latest PC card standard, which offers very fast connections and low power usage.

Card Reader/Writer _ A device that allows one to transfer data directly from a cameras removable flash memory card to the computer without the need to connect the camera to the computer.

Carrier Frequency _ The carrier frequency is a frequency used as a carrier in order to transmit other signals. The actual information to be transmitted is impressed on the carrier frequency in accordance with one of many available procedures. This procedure is referred to as modulation (frequency, amplitude & phase modulation).

Cartesian Coordinate System _ Coordinate system used to define specific points in three-dimensional space. It's center is the origin, through which run the X, Y, and Z axes. A point is located within the coordinate system by specifying a value for each of these axes. The values can be positive and negative. A point is expressed as (X, Y, Z). The origin has a value of (0,0,0).

Cartridge _ A removable silicon (rather then optical or ferromagnetic) storage medium that was the main medium on which the majority of 16 bit games software was available.

Cassette Memory _ A cassette memory IC (Integrated Circuit) can be mounted on DV cassettes. The memory size is always indicated on the DV equipment and tape. Besides the basic data for the tape, various new functions can be recorded on this cassette memory, like table of contents, tape label, titles. CM enables quick search by date or title, photo search, superimposing titles etc.

Catchlight _ Refers to the reflection of a light source in a subject's eyes. Intentionally creating catchlight, by providing a small amount of illumination with a flash or reflector, can make the subject look more vivid, especially in animated characters.

Cathode Ray Tube (CRT) _ the chief component of a video display monitor. The cathode ray tube consists of a screen composed of phosphorescent dots (phosphors, for short). When the phosphors are excited by an electron gun, they glow at an intensity dependent on the voltage applied to the gun. Phosphors can be of different colors, hence providing color CRT displays.

CATV _ *Community Antenna Television* - Cable TV. In its early form cable television was an antenna system that served a community.

CAV _ a) *Component analog video.* Component video signals in which an analog voltage or current (rather than a set of numbers) represents the value of the pixel, the same as "analog components". Encoded video signals that can provide greater color resolution than composite video. **_ b) *Constant angular velocity*** (constant RPM or revolutions per minute) - Rotating a Laser disk at a constant speed. Since the length of the inner tracks are smaller than the outer tracks, the same clock frequency for recording causes the innermost track to be the most dense and the outermost track to be the least dense. In order to utilize the space more efficiently, zoned CAV (Z-CAV) breaks the disk into multiple zones and uses a different clock frequency for each zone. The innermost track of each zone is the most dense for that zone. Partial CAV (P-CAV), also known as CAV/CLV, breaks the disk into only two zones. It varies the disk rotation (CLV) for the inner zone and then switches to constant speed (CAV) for the outer one.

CBP _ *Coded Block Pattern*.

CBR _ *Constant bit rate* - CBR refers to the delivery of multimedia where there is dedicated bandwidth and the data can be delivered at a guaranteed constant bit rate. MPEG-1 and 2 are designed for CBR delivery. Constant bit rate cannot be assured on the Internet or most Intranets.

CBT _ *Computer-Based Training*. Using the computer for training and instruction. CBT programs are called "courseware" and provide interactive training sessions for all disciplines. Using graphics extensively, CBT was originally introduced on LaserDiscs, then CD-ROMs and, later, online. CBT courseware is typically developed with authoring languages that are designed to create interactive question/answer sessions.

CCD _ *Charge-coupled device* - The image sensor that separates the spectrum of color into red, green and blue for digital processing by the camera. In digital cameras both Area and Linear CCDs are used. A CCD captures only black-and-white images. To create color, a color Bayer pattern is laid down on the sensor pixels, using a color mask like RGBG, (Red, Green, Blue and Green). The extra Green is used to create contrast in the image. Cameras of higher quality use a 3-CCD system which breaks the image into the base colors of red, green and blue before digitally recording them. ***Area CCD*** A square or rectangular CCD that can capture an entire image at once, which is essential for dynamic subjects and flash photography. ***Linear CCD*** a.k.a. scanner-type CCD, these sensors are long and thin, and capture an image by recording a vast number of individual "exposures" while scanning across the picture frame. These are best suited for still subjects and continuous illumination. CCDs are analog sensors, the digitizing happens when the electrons are passed through the A/D converter. Older CCDs could not reproduce a wide range of brightness but they now offer low noise, high resolution imaging up to HDTV level.

CCD Array _ *Charge-Coupled Device array* - Light sensitive diodes used in scanners and digital cameras that sweep across an image during capture and, when exposed to light, generate a series of digital signals that are converted into pixel values.

CCDC _ Channel Compatible DigiCipher. An HDTV system proposed by the American Television Alliance, consisting of General Instruments and Massachusetts Institute of Technology.

CCIR _ *Comité Consultatif International des Radiocommunications* - a global organization responsible for establishing television standards. The CCIR no longer exists – it has been absorbed into the parent body, the ITU.

CCIR 601 _ Now known as **ITU-R BT.601.** The standard for digitizing component video in standard definition. Sometimes called D1 after the VTR format that first used this signal. It is also called 4:2:2, which refers to the number of samples taken from the video channels respectively, in order to digitize and encode it. They sample the Y at four times the speed of the video (which is roughly 6 MHz) and the R-Y and B-Y are sampled at 2 times the speed of the video. The sample values are encoded into 10 bit words, and then transmitted serially, over one line, hence serial digital.

CCTV _ *Closed Circuit Television* - A distribution system that limits reception of an image to those receivers which are directly connected to the origination point by coaxial cable or microwave link.

CD _ *Compact Disk* - the digital data storage media proposed by Philips and Sony in 1983. An optical disk storage media that is designed to store audio, video, and computer data in a digital format. The disc is a plastic platter 120mm (4.75") in diameter, recorded on one side, with individual selections playable in any sequence. CD's have a capacity to store 650 Mb (megabytes) of data. The digital information in a standard audio CD is encoded in the PCM format. Sound is converted into digital code by sampling the sound waves 44,056 times per second and converting each sample into a 16-bit number. It requires approximately 1.5 million bits of storage for each second of stereo hi-fi sound. The audio tracks are recorded as microscopic pits in a groove that starts at the center of the disc and spirals outward to the edge. In practice today, the term "CD" is used to refer to both audio CDs and data CDs (CD-ROMs). In the early 1990s when CD-ROMs first became popular, "CD" meant music, and "CD-ROM" meant data. Today, a CD can refer to both music (C_ D) or data (CD-ROM, CD-R, CD-RW). The purists, of course, will always use the correct name for the medium. Documentation for various CD formats are found in books commonly known by the color of their covers. *Red Book - Audio CDs (CD-DA); Yellow Book - CD-ROM*; *Orange Book - Recordable (Photo CD, CD-R, etc.); Green Book - CD-I; White Book - Video CD; Blue Book - CD Extra*

CD + _ An initial extension to CD audio which allowed for storing text (lyrics) within the subcode of the audio data.

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

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

CD Drive _ A drive mechanism for recording or playing CDs. The most common types are CDROM, MO (magneto-optical), and WORM (Write Once, Read Many).

CDE _ *Compact Disc / Erasable* - The original name for rewritable CDs (CD-RWs).

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

CD Graphics _ Still-frame pictures are digitally recorded on to a disc the same size as a CD using a subcode beyond the audio signal range of normal compact discs.

CD I _ A compact disc format developed by Philips in 1986, designed to allow interactive multimedia applications to be run on a player attached to a television. Format provides audio, digital data, still (motionless) graphics and limited motion video The standard document defining CD-I is called the Green Book.

CD R _ *CD-Recordable* - A recordable CD technology for data and music storage using a low-cost disc that can be written only once. To record a 650MB disc takes from 5 to 74 minutes depending on the speed of the drive. A feature of many CD-R drives, called multisession recording, enables you to keep adding data to a CD-R over time. However, you cannot erase any of the data once it is written to the disk "CD-R" is often used to refer to write-once CDs, in contrast to CD-RW.

CD R Burner _ A device capable of recording data on to blank CD-R discs.

CD ReWritable Media _ A Kodak product on which users can record text, images and graphics for permanent or temporary storage. Because it allows multiple recordings, users can erase and rewrite as often as needed.

CD ROM _ Abbreviation for **compact disc read-only memory**; A CD that cannot be written to. Playback is through a CD-ROM drive unit. A standard for compact disc to be used as digital memory media for personal computers. The specifications for CD-ROM were first defined in the Yellow Book. The audio CD player cannot play CD-ROMs, but CD-ROM players can play audio discs.

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

CD ROM Server _ A CD-ROM reader designed for network use. It can be configured as a tower or jukebox. Towers contain several drives, and each drive holds one CD-ROM. Jukeboxes hold from a couple dozen to hundreds of discs, but have only a small number of drives. A robotic mechanism moves the discs to the drives as required.

CD ROM XA _ "XA" stands for Extended Architecture. An extension of the CD-ROM standard billed as a hybrid of CD-ROM and CD-I, and promoted by Sony and Microsoft. The extension adds ADPCM audio to permit the interleaving of sound and video data to animation, with sound synchronization. CD-ROM XA is an extension of the Yellow Book standard, generally consistent with the ISO 9660 logical format but designed to add better audio and video capabilities so that CD-ROM could more easily be used for multimedia applications. CD-ROM XA was abandoned as an independent multimedia format, but Photo CDs are written in the CD-ROM XA physical format.

CD RW (CD ReWritable) _ A rewritable CD technology. CD-RW drives can also be used to write CD-R discs, and they can read CD-ROMs. A CD-RW disc can be rewritten over a thousand times and read on MultiRead CD-ROM drives or CD-RW compatible Audio CD players. CD-RWs support UDF (Universal Disc Format), which means they are designed for read-write interoperability between all the major operating systems as well as compatibility between rewritable and write-once media. Today, both high-speed and current speed CD-RW are available.

CD Text _ An Audio CD format in which up to 5000 characters of CD information (title, artist, song titles, and so on) is written into the CD's Table of Contents. This information is displayed when the CD is played back on CD Text-enabled players.

CD UDF _ **CD Universal Data Format** - A CD-R and CD-RW format introduced in 1996 that allows data to be recorded in packets rather than in a continuous stream. This format is similar to a hard disk and enables small numbers of files to be added. It also eliminates underruns where the computer cannot keep up with the recording process.

CD Writer _ A special unit, fitted into a PC that allows the user to make copies of their own licensed software or music.

CD+G _ **CD+Graphics** - (also known as *karaoke*) An audio CD format that allows images to be stored in six of the eight subcode channels of the CD (P through W). Also known as the "R-W subchannels," because R, S, T, U, V and W are used, each of which can hold 4MB. CD+G discs have primarily been used for Karaoke (sing along) CDs, and the lyrics are stored as images (bitmaps). The data in the subchannels cannot be copied with most current systems or software.

CDS _ **Correlated Double Sampling** - a circuit commonly used to process the output signal from a CCD image sensor in order to reduce low-frequency noise components.

CDTV _ a) A short lived interactive multimedia compact disc format developed by Commodore which worked in conjunction with a television set. **_ b) Conventional Definition Television**. The analogue NTSC, PAL, SECAM television system with normal 4:3 aspect ratio pictures.

CEA_ Consumer Electronics Association This is an association of consumer electronics manufacturers primarily involved in a general promotion of that industry. The CEA holds an annual convention in Las Vegas each January called the Consumer Electronics Show. The organization is also involved in defining some standards and practice rules for products.

CEBus _ Consumer Electronics Bus - A multimedia distribution system in the home.

CED _ *Capacitance Electronic Disc* - Rather strange analogue video disc format. Also known as Selectavision, it was manufactured by Hitachi and GEC, and launched around 1983. These were double sided 12" vinyl video discs, protected inside a plastic sheath. They were played using a sapphire stylus hidden within the machine.

Cel Animation _ a) Traditional form of animation. Images are drawn by hand, transferred to acetate, colored and photographed one frame at a time. Also called onion skinning, an animation technique in which a background painting is held in place while a series of transparent sheets of celluloid containing objects are placed over the background painting, producing the illusion of movement. **_ b)** A method of creating computer animations by emulating the movie animation technique of creating a sequence of individual frames of action, each of which differs slightly from the previous one. When these frames are played rapidly, the illusion of animation is created.

Celeron _ A family of lower-cost Pentium II chips from Intel that was introduced in mid-1998. The first models (266 and 300MHz) did not include an external L2 cache and were somewhat sluggish, relegating them to an entry-level or novice rating. However, subsequent models added 128KB of L2 cache that runs at the full speed of the CPU just like the high-end Xeon chips that contain up to 2MB of L2. The chip yields are greater with smaller amounts of cache and can be sold at a better price. Pentium III-based Celerons using the Coppermine technology were introduced in 2000.

Cell _ a) A tiny area within an integrated circuit that stores a bit in the form of an electrical charge. **_ b)** In DVD-Video, a cell is a unit of video anywhere from a fraction of a second to many hours. Cells allow the video to be grouped for sharing content among titles, interleaving for multiple angles, and so on.

CENELEC _ *European Committee for Electro-technical Standardization*.

Central Processing Unit (CPU) _ The component of a computer system responsible for the processing of all data. Employing specialized memory cells called registers, the CPU fetches data from memory, performs operations on it while it resides in the registers, and returns the results to RAM.

Centrino _ An integrated set of chips from Intel for wireless mobile PCs. Introduced in 2003, it includes the Pentium M processor, 855 chipset family and PRO/Wireless adapter for 802.11b WiFi networking. Centrino also provides enhanced battery life. Because Centrino chips run cooler, less cooling apparatus is required, allowing for slimmer case construction.

Centronix _ A common PC (parallel) network interface.

CF _ *CompactFlash* Memory Cards. **Type I** the original 5mm high card, **CF Type II** cards and devices that are 9mm high. Type I devices are all solid state but Type II devices include the new ***IBM Microdrive***, a miniature, rotating hard drive.

CFA _ *Color Filter Array* - A mosaic or stripe layer of colored transmissive filters fabricated on of an imager in order to obtain a color image from a single-image sensor.

CG _ a) Short for "***Computer Generated***" and usually refers to special effects shots. If someone says, "The background was all CG." it means that the background image was done in a computer. **_ b)** Acronym for Computer graphics **_ c)** Acronym for Character Generator

CGA _ *Color graphics adapter* - Introduced in 1983, it was IBM's first product to display both color and graphics. An RCA jack above the 9- pin video output connector provides NTSC video. The signal type is TTL, non-interlaced, with pixel x line resolution of 640 x 200 and a color palette of 4/16. CGA has a horizontal scan frequency of 15.75 kHz and vertical frequency of 60 Hz.

CGI _ a) *Common Gateway Interface* - An interface creation scripting program that allows you to make WWW pages on the fly, based on information from various types of fill-in forms, checkboxes and text input forms, etc. **_ b)** Abbreviation for *Computer Graphic Imagery* or *Computer Generated Imagery*" and simply means that an image was done in a computer.

CGM _ *Computer Graphic Metafile* - is a vector based standard format which allows graphics images to be transferred from one application to another.

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 _ a) A digital effects processing path for video. **_ b)** A portion of the television broadcast spectrum assigned to a particular broadcasting station. **_ c)** One piece of information stored with an image. Each component color that defines a computer graphic image - red, green, and blue - is carried in a separate channel, so each may be adjusted independently. Channels may also be added to a computer graphic file to define masks. **_ d)** A single strip of controls in a mixing console relating to either a single input or a pair of main/monitor inputs. **_ e)** A connection or socket on the motherboard or controller card. A motherboard may have one or two channels (primary and secondary). **_ f)** One of 16 possible data channel over which MIDI data may be sent. The organization of data by channels means that up to 16 different MIDI instruments or parts may be addressed using a single cable. **_ g)** The term used for a Chat Room on IRC (i.e. Internet Relay Chat)

Channel Coding _ Data encoding and error correction techniques used to protect the integrity of data that is being transported through a channel. Typically used in channels with high bit error rates such as terrestrial and satellite broadcast and videotape recording.

Channel Message _ A type of MIDI message that carries specific channel information.

Chaoji VideoCD _ Another name for *Super VideoCD*.

Chaos _ Not the state of things on my desk – rather a science that deals with the underlying order of the seemingly random nature of the universe.

Chapter _ A chapter in a videodisc is a section divider. Chapters are sub-sets of the videodisc. In the DVD format a chapter is a division of a title.

Chapterization _ The process of placing markers into the timeline of a video to demark the beginning points of sequences, or chapters, to which a viewer may "jump," at will, during playback, so long as chapterization is supported by the video architecture in use. *True streaming* of video supports chapterization; *pseudo-streaming*, a.k.a. *progressive download*, does not.

Character generator _ A device or software application running on a computer and used for creating text for display over video (e.g., titles and credits).

Chase _ Term describing the process whereby a slave device attempts to synchronize itself with a master device. In the context of a MIDI sequence, Chase may also involve chasing events, looking back to earlier positions in the song to see if there are any program change or other events that need to be acted upon.

Chat _ A chat facility is a connection-based service that permits a group of individuals to have conversations over the Internet. Two or more users share a channel over which they exchange text-based messages in real-time. To use chat, you must have a chat client program or access to a server that provides the facility.

Checksum _ An error-detecting scheme which is the sum of the data values transmitted. The receiver computes the sum of the received data values and compares it to the transmitted sum. If they are equal, the transmission was error-free.

Chip _ A chip is a single flat rectangular piece of silicon on which a specific semiconductor element or circuit has been fabricated. Most chips are placed into larger packages that provide protection and facilitate connection of the chip to the system. Also known as die and often colloquially used to describe an integrated circuit.

Chip Carrier _ A chip package with connectors on all sides. The housing that chips come in for plugging into (socket mount) or soldering onto (surface mount) the printed circuit board. Creating a mounting for a chip might seem trivial to the uninitiated, but chip packaging is a huge and complicated industry. The ability to provide more and more I/O interconnections to a die (bare chip) that is increasingly shrinking in size is an ever-present problem. In addition, the smaller size of the package contributes as much to the miniaturization of cellphones and other handheld devices as the shrinking of the semiconductor circuits.

Chip on Board _ A bare chip that is mounted directly onto the printed circuit board (PCB). After the wires are attached, a glob of epoxy or plastic is used to cover the chip and its connections. The tape automated bonding (TAB) process is used to place the chip on the board.

Chip on Chip _ A 3-D cube of chips, using bare chips mounted one over the other with spacers in between. As this technology matures, it is expected that up to 100 chips can be used in one cube.

Chipset _ A group of chips designed to work as a unit to perform a function. For example, a modem chipset contains all the primary circuits for transmitting and receiving.

Chorusing _ A doubling effect commonly found on a synthesizer or sampler that makes a single sound appear to sound like an entire ensemble. The initial signal is split and appears at a slightly altered pitch from the original, or at a slightly later point in time. This time and pitch level are often controllable by a low frequency oscillator (LFO).

Chroma _ The color of an image element (pixel). _ **a)** Hue and saturation are qualities of chroma. Chroma does not include black, gray or white. The purity or intensity of color, sometimes called "hue". Color information independent of luma intensity, or brightness. Without the chroma signal, the video picture would be black and white. _ **b)** The (M) NTSC or (B, D, G, H, I) PAL video signal contains two parts that make up what you see on the screen: the black and white (luma) part, and the color (chroma) part.

Chroma Bandpass _ In a **NTSC** or **PAL** video signal, the luma (black and white) and the chroma (color) information are combined together. If you want to decode an NTSC or PAL video signal, the luma and chroma must be separated. A chroma bandpass filter removes the luma from the video signal, leaving the chroma relatively intact. This works reasonably well except in images where the luma and chroma information overlap, meaning that we have luma and chroma stuff at the same frequency. The filter can't tell the difference between the two and passes everything. This can make for a funny-looking picture. Next time you're watching TV and someone is wearing a herringbone jacket or a shirt with thin, closely spaced stripes, take a good look. You may see a rainbow color effect moving through that area. What's happening is that the video decoders thinks that the luma is chroma. Since the luma isn't chroma, the video decoder can't figure out what color it is and it shows up as a rainbow pattern. This problem can be overcome by using a **comb filter**.

Chroma Corrector _ A device that corrects problems related to a video signal's chroma, color balance, and color noise.

Chroma Crawl _ An artifact of encoded video also known as dot crawl or crossluma. It occurs in the video picture around the edges of highly saturated colors as a continuous series of crawling dots ("dancing ants") and is a result of color information being confused with luma information by the decoder circuits.

Chroma Delay _ A video problem in which the color of an object or area is shifted slightly to the right of the luma (intensity).

Chroma Demodulator _ After the NTSC or PAL video signal makes its way through the Y/C separator, the colors must be decoded. That's what a chroma demodulator does. It takes the chroma output of the Y/C separator and recovers two color difference signals (typically I and Q or U and V). Now, with the luma information and two color difference signals, the video system can figure out what colors to display.

Chroma Gain _ In video the gain of an amplifier as it pertains to the intensity of colors in the active picture.

Chroma Keying _ a) The process of overlaying one video signal over another, the areas of overlay being defined by a specific range of color, or chrominance, on the foreground signal. For this to work reliably, the chrominance must have sufficient resolution, or bandwidth. PAL or NTSC coding systems restrict chroma bandwidth and so are of very limited use for making a chroma key which, for many years, was restricted to using live, RGB camera feeds. An objective of the ITU-R BT.601 digital sampling standard was to allow high quality chroma keying in post production. The 4:2:2 sampling system allowed far greater bandwidth for chroma than PAL or NTSC and helped chroma keying, and the whole business of layering, to thrive in post production. High signal quality is still important and anything but very mild compression tends to result in keying errors appearing - especially at DCT block boundaries. Some digital (heavily compressed) video systems have a restricted chroma bandwidth and are therefore unsuitable for high quality chroma keying. Chroma keying techniques have continued to advance and use many refinements, to the point where totally convincing composites can be easily created. You can no longer

"see the join" and it may no longer be possible to distinguish between what is real and what is keyed. _ **b)** The ability to recognize a key color within a texture map and make it transparent during the texture mapping process. Since not all objects are easily modeled with polygons, chroma keying is used to include complex objects in a scene as texture maps.

Chroma Trap _ The chroma trap is one method for separating the chroma from the luma, leaving the luma relatively intact. How does it work? The NTSC or PAL signal is fed to a trap filter. For all practical purposes, a trap filter allows certain frequencies to pass through, but not others. The trap filter is designed with a response to remove the chroma so that the output of the filter only contains the luma. Since this trap stops chroma, it's called a chroma trap. The sad part about all of this is that not only does the filter remove chroma, it removes luma as well if it exists within the frequencies where the trap exists. The filter only knows ranges and, depending on the image, the luma information may overlap the chroma information. The filter can't tell the difference between the luma and chroma, so it traps both when they are in the same range. What's the big deal? Well, you lose luma and this means that the picture is degraded somewhat. Using a **comb filter** for a **Y/C separator** is better than a chroma trap or **chroma bandpass**.

Chromatic _ A scale of pitches rising in semitone steps.

Chromatic Aberration _ Also known as the "purple fringe effect." It is common in two Megapixel and higher resolution digital cameras (especially those with long telephoto zoom lenses) when a dark area is surrounded by a highlight. Along the edge between dark and light you will see a line or two of purple or violet colored pixels that shouldn't be there.

Chrominance _ Commonly used term for chroma.

CIE _ *Commission Internationale de l'Eclairage* - The International Commission on Illumination, an international group that has developed a set of color definition standards. The organization responsible for the chroma diagram of 1939. A three dimensional diagram that defines light and color. Other systems have been developed by CIE more recently.

CIF _ *Common Interface Format* or *Common Image Format* - The Common Interface Format was developed to support video conferencing. It has an active resolution of 352 x 288 and a refresh rate of 29.97 frames per second. The High-Definition Common Image Format (HD-CIF) is used for HDTV production and distribution, having an active resolution of 1920 x 1080 with a frame refresh rate of 23.976, 24, 29.97, 30, 50, 59.94, or 60 Hz.

CIFF _ *Camera Image File Format* - an agreed method of digicam image storage used by many camera makers.

Cinema Studio Modes _ This Digital Cinema Sound feature recreates the precise acoustics of three movie production dubbing stages in Hollywood. You'll hear movies in the same acoustic environments the directors heard when final sound tracks were approved.

CineMotion _ Reverse 3-2 Pull- Down Technology. Sony's term for a TV circuit that detects a 3-2 Pull-Down sequence and performs the reverse or inverse operation. When film studios release their work on TV, DVD, or videotape, they have to transfer film (which runs at 24 frames per second) to video (which runs at 30 frames per second). How do you get 24 into 30 without speeding up the film? Well, first take note that video actually flashes 60 half frames, called fields, per second because of its interlaced scan. The film studio has a machine (telecine) that takes one film frame and transfers it to three video fields, then takes the next film frame and transfers to two video fields - thus 3-2. The technology makes it possible to watch films at home, but creates imperfections and subtle speed shifts in the movie. A Reverse 3-2 Pull-Down circuit looks at the video as it's coming through the television, and in a split second rearranges the fields into whole film frames like completing a puzzle. The surprising thing is that the TV's circuit doesn't have to interpolate, or guess, how the film frames actually started out; it has all the necessary clues and can recreate the film perfectly.

Cinepak _ A commonly used QuickTime codec for compression of video files on CD-ROM. High - quality medium bandwidth compression that is not real-time but can play back in software. Cinepak offers temporal and spatial compression, and data-rate limiting. Its 24-bit format produces video at 320 x 240 resolution and 15 frames per second at a 150 Kbps data rate. Commonly a CD-ROM solution developed a number of years ago and not a competitor to more modern techniques.

Circuit Switching _ Circuit switching refers to a method of organizing the transmission of messages across a network. In circuit switching networks a dedicated circuit is allocated for the entire duration of a transmission (telephone switching networks use this method). Contrast with packet switching.

CISC _ Acronym for *Complex Instruction Set Computing Device*. A highly flexible but not very efficient device containing a number of instructions for specific applications in a microprocessor

Clamp _ This is basically another name for the DC-restoration circuit. It can also refer to a switch used within the DC-restoration circuit. When it means DC restoration, then it's usually used as "clamping". When it's the switch, then it's just "clamp".

Clamping _ When dealing with textures, the process of repeating the last pixel encountered on the texture across the rest of the object.

Click _ the sound the mouse button makes when you press it. It's quicker to say "click on that", rather than "press the mouse button when the cursor is on that"... One click selects (chooses) something; a double-click opens a file or program. Holding down the mouse button (Macintosh) or using the right mouse button (Windows) offers you a range of options and commands.

Click and Drag _ A computer term for the user operation of clicking on an item and dragging it to a new location.

Click Potato _ The cyberspace version of the couch potato.

Click Track _ Metronome pulse which assists musicians in playing in time.

Client _ In a client/server architecture, the client is a software application that makes requests of the *server* on behalf of the end-user. A Web *browser* is a client application; a media *player* is also a client application. Sometimes the term "client" is also used to refer to a PC or workstation (hardware) on a network being used by an individual to access data and or applications hosted on a server.

Client Machine _ A user's workstation that is attached to a network. The term can also refer to a portable computer that is plugged into the network.

Client/server Architecture _ An environment in which the application processing is divided between client workstations and servers. It implies the use of desktop computers interacting with servers in a network in contrast to processing everything in a large centralized mainframe.

Cliff Effect _ When approaching the fringes of reception, analog TV pictures begin to degrade by becoming "snowy." With DTV its all or nothing. In an area with a weak digital signal, a relatively small reduction in signal strength may cause the DTV signal to abruptly change from perfect to nothing; hence the name "cliff effect."

Clip _ **a)** The name is taken from the film industry and refers to a segment of sequential frames made during the filming of a scene. In television terms a clip is the same but represents a segment of sequential video frames. A video clip can also be recorded with audio or have audio added to it. _ **b)** Individual video and audio sequences in post production. As a rule, it only refers to the graphical display of images and sound sequences in the Project files or in the timeline. Since clips are only links to the actual data (Media Files on the hard disks), they can be edited without modification of the actual data on the hard disk. _ **c)** In keying, the trigger point or range of a key source signal at which the key or insert takes place. _ **d)** The control that sets this action. To produce a key signal from a video signal, a clip control on the keyer control panel is used to set a threshold level to which the video signal is compared. _ **e)** In digital picture manipulators, a menu selection that blanks portions of a manipulated image that leave one side of the screen and "wraps" around to enter the other side of the screen. _ **f)** Also, an entire video or a portion of a video which is streamed over the Internet

Clip Logging _ Identifying and storing short videoclips along with statistics such as duration and type (audio or video) for later assembly into a finished product.

Clip Properties _ A clip's specific settings, including frame size, compressor, audio rate, etc.

Clip sheet _ A nonlinear editing term for the location of individual audio/video clips (or scenes). Also known as a clip bin.

Clipart _ These are ready made images, illustrations or pictures which are usually supplied on a CD-ROM and can be inserted into documents, presentations, and projects. Sometimes they are supplied free with new software packages. Clipart is usually supplied "Royalty Free" and is free of copyright.

Clipboard _ An area in memory (RAM) where data can be temporarily stored for later access. For example, when we cut and paste a passage using a word processor, we first cut the passage from its original position and place it on the clipboard, then paste it from the clipboard to its destination.

ClipLink _ The ClipLink function developed by Sony includes a bundle of individual functions included into devices equipped with the DVCAM format. ClipLink mainly offers advantages in post production. Different additional information, such as start and stop time code and picture icons, is stored together with each recorded scene. When Camcorder is recording, an evaluation (NG=no good or OK=good) can be assigned to each take by pressing a button. A specially equipped editing system can read these data, adapt them if necessary and load the takes marked as OK onto the hard disk. To make use of ClipLink functions, tapes including a storage chip have to be used in the case of original recordings.

Clipping _ Amplitude limiting. _ **a)** The process of removing graphics (polygons or 2D images) that stray outside a 3D world's area, or the viewing area (the screen). _ **b)** Digital audio distortion. Digital audio systems exhibit less tolerance to overloading than analog audio systems. If you exceed a certain level, noticeable distortions can be heard. This is particularly important to keep in mind when converting audio signals, for example, from analog to digital or between different digital formats. Converters only offer distortion-free operation up to a precisely defined level. _ **c)** The threshold or the setting of a suitable threshold during keying. For example, if luminance keying is carried out, one has to predetermine up to which luminance value keying is supposed to take place.

Clipping Level _ An electronic limit to avoid overdriving an audio or video signal.

Clipping Logic _ A circuit used to prevent illegal conversion. Some colors can exist in one color space but not in another. Right after the conversion from one color space to another, a color space converter might check for illegal colors. If any appear, the clipping logic is used to limit, or clip, part of the information

until a legal color can be represented. Since this circuit clips off some information and is built using logic, it's not too hard to see how the name "clipping logic" was developed.

Clock _ The activities of the CPU in a computer system must be carefully sequenced, making sure that one task has completed before the next task is initiated. The system clock is used to provide this sequencing/timing control. The rate at which the clock "ticks" (i.e. cycles) will determine how rapidly the CPU can switch from one task to another. Clock speeds are usually measured in MHz (millions of cycles per second).

Clock Frequency _ The master frequency of periodic pulses that are used to synchronize the operation of equipment.

Clock Jitter _ Undesirable random changes in clock phase.

Clock Recovery _ The reconstruction of timing information from digital data.

Clock Skew _ A fixed deviation from proper clock phase that commonly appears in D1 digital video equipment. Some digital distribution amplifiers handle improperly phased clocks by reclocking the output to fall within D1 specifications.

Clock Speed _ This is a measure of the speed at which a processor operates, normally expressed in megahertz (MHz) or Gigahertz (GHz). CPUs run at different clock speeds measured in MHz. The faster the clock speed, the quicker a particular processor can perform a function.

Clone _ An exact copy, indistinguishable from the original. As in copying recorded material, e.g. copy of a non-compressed recording to another non-compressed recording. If attempting to clone compressed material care must be taken not to decompress it as part of the process or the result will not be a clone.

Cloning _ To make an exact duplicate of digital image data. In digital systems it is possible to copy part of an image onto another.

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

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

Closed Architecture _ Computers that are proprietary or restricted by language to a specific platform or application.

Closed Captioning _ Text stream included in broadcast signal that provides narrative description of dialogue, sounds, and other elements of the picture. May also be used in a secondary audio application. For NTSC, the caption signal may be present on lines 21 and 284. For PAL, the caption signal may be present on lines 22 and 334. For MPEG-2 video, the closed caption data are multiplexed as a separate data stream within the MPEG-2 bitstream. For DVD, caption data may be 8-bit user_data in the group_of_pictures header (525/60 systems), a digitized caption signal (quantized to 16 levels) that is processed as normal video data (625/50 systems), or a subpicture that is simply decoded and mixed with the decoded video.

Clustering _ Using two or more computer systems that work together. It generally refers to multiple servers that are linked together in order to handle variable workloads or to provide continued operation in the event one fails. Each computer may be a multiprocessor system itself. For example, a cluster of four computers, each with four CPUs, would provide a total of 16 CPUs processing simultaneously.

Clusters _ The little areas on the computer's hard drive were files are stored and organized into sectors and blocks.

CLUT _ An Acronym for *Color Lookup Table*, a color indexing system used by some computers to reference color if their systems do not support a high enough bit depth to represent all colors.

CMD _ *Charge Modulated Device* - is an active pixel sensor (APS), using a pixel structure borrowed from CCD technology. Two transistors reside in each pixel producing a high fill factor. CMDs also use CMOS technologies to produce images.

CMOS _ a) *Complementary Metal Oxide Semiconductor* - CMOS semiconductors use two circuits, negative and positive polarity circuits. Because only one of the circuits can be on at once, CMOS chips are less energy consuming than other chips that utilize simply one type of transistor. This is a clear advantage of the CMOS sensor over the standard CCDs in use today. _ **b)** A special lithium battery inside your computer that stores the BIOS information. Usually around 3 volts in capacity.

CMS _ *Color Matching System, Color Management System -* A software program (or a software and hardware combination) designed to ensure color matching and calibration between video or computer monitors and any form of hard copy output.

CMYK _ *Cyan, Magenta, Yellow, Black* These are the printer colors used to create color prints. Most color printers, Ink-Jet, Laser, Dye-Sublimation and Thermal printers use these as their printer colors.

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

Coaxial _ A speaker type that utilizes a tweeter mounted at the centre of a woofer cone. The idea being to have the sound source through the full frequency range become coincident.

COBOL _ *Common Business Oriented Language* - A high-level programming language that has been the primary business application language on mainframes and minis. It is a compiled language and was one of the first high-level languages developed. Officially adopted in 1960, it stemmed from Flomatic, a language in the mid-1950s.

Code _ A set of machine symbols that represents data or instructions.

Code Density _ The amount of space that an executable program takes up in memory. Code density is important in PDAs and handheld devices that contain a limited amount of memory.

Code Signing _ A method of ensuring that an executable program is coming from a valid software publisher. Also known as "object signing," the EXEs, DLLs or other executable file types are digitally signed and transmitted along with a digital certificate from a certification authority (CA) such as VeriSign. The end user application such as the Web browser uses the widely known public key of the CA to decrypt the digital certificate and extract the public key of the publisher. It uses the pub-

lisher's public key to decrypt the digital signature, which is a hash, or digest, of the executable files. It computes its own hash from the files and compares the two to ensure they are the same.

Codec _ a) *Coder-Decoder* - Hardware or software that converts analog sound, speech or video to digital code and vice versa (analog to digital - digital to analog). Codecs must faithfully reproduce the original signal, but they must also compress the binary code to the smallest number of bits possible in order to transmit faster. As network bandwidth increases, so does the demand for more audio and video, so compression is always an issue. Codecs can be software or hardware. Software codecs are installed into audio and video editing programs as well as media players that download audio and video over the Web. Software codecs rely entirely on the PC for processing. Hardware codecs are specialized chips built into digital telephones and videoconferencing stations to maximize performance. Although hardware codecs are faster than software routines, faster desktop machines are increasingly enabling software codecs to perform quite adequately. **_ b) *Compressor - Decompressor*** Hardware or software that compresses digital data into a smaller binary format than the original. This function is built into the audio and video codec in definition above, thus, a true compressor/ decompressor is supposed to refer to codecs that perform only compression and possibly encryption, but not analog to digital and digital to analog conversion. Some popular codecs for computer video include MPEG, Indeo, Cinepak, QuickTime and Video for Windows.

Coding _ a) The process of translating an algorithm (or a program design) into an executable program. **_ b)** the process of taking a signal and reducing the number of bits, energy, time, or bandwidth necessary for its transmission.

COFDM _ *Coded orthogonal frequency division multiplexing* - COFDM can transmit many streams of data simultaneously, each one occupying only a small portion of the total available bandwidth. This is the DTV standard in Europe , and was considered for the US, but the 8VSB standard has prevailed..

Cognitive Science _ A study of the processes and capabilities of the human brain and how these might be modeled in computer hardware and software. At the intersection of computer science, physiology, and psychology, this area of study is in its embryonic stages, but many think it will be an exceedingly active area of research in coming decades.

Coherence_ Listening term, refers to how well integrated the sound of the system is.

Coin-Op _ A coin operated console normally found in arcades.

COLD _ *Computer Output to Laser Disc* Archiving large volumes of transactions on optical media. Instead of printing large paper reports or producing microfilm or microfiche, data are stored on optical disks. The advantage of COLD over COM (Computer Output Microfilm) for high-volume, archival storage is that optical disks can be directly accessed just like a hard disk.

Collating Sequence _ A method of alphabetizing digitized character strings based on the numerical sequence in which characters are encoded (as in the ASCII scheme) for digital storage. Sorting, one of the most common computer operations is based on this numerical sequence, which is called the collating sequence.

Collect _ the act of gathering information in the form of analog or digital input through devices such as scanners, microphones, camcorders, TV cameras, pressure transducers and keyboards.

Collection _ a grouping of all the video files pertaining to a project.

Collision _ The result of two devices trying to use a shared transmission medium simultaneously. The interference ruins both signals, requiring both devices to retransmit the data lost due to the collision.

Collision Detection _ The process whereby the boundaries of objects are detected by other objects in a scene. This prevents objects from passing through each other.

Co-location _ a) An outsource, usually a dedicated facility or facilities, that provides physical space for and/or shared usage of essential computer equipment such as Web servers and, often, mission-critical managed services. **_ b)** In transmission, one or more transmitters located on the same antenna mast.

Color Adjust Filter _ In the editing software filter that produces a change in the color aspects of a clip by allowing adjustment of individual channels.

Color Adjustment _ A video adjustment that is used to control color intensity.

Color Balance _ The accuracy with which the colors captured in the image match the original scene, usually using the white as a reference.

Color Bars _ A standard test signal that appears as a series of vertical rows of color by which the chrominance and video levels of a camera's output or a recorded signal can be checked. They are generated electronically, and often accompanied by a 1000 Hz (1MHz) audio tone. A test pattern containing six basic colors: yellow, cyan, green, magenta, red, and blue used to check the chroma functions of color TV systems. Also can be checked with a vectorscope.

Color Burst _ A waveform of a specific frequency and amplitude that is positioned between the trailing edge of horizontal sync and the start of active video. The color burst tells the **color decoder** how to decode the color information contained in that line of active video. By looking at the color burst, the decoder can determine what's blue, orange, or magenta. Essentially, the decoder figures out what the correct color is.

Color Calibration _ A process by which the input (digital Camera, Scanner) Monitor, and Output (printer) are matched to use the same or similar color palette. This insures that the image as seen on the monitor has the same range of colors as the image that is printed, and any adjustments made to the color of the image in the computer are accurately represented when the image is printed.

Color Cast _ An unwanted tint of one color in an image caused by a disproportionate amount of cyan, magenta, and yellow. This can occur due to an input or output device.

Color Clip _ A simple background color used in a movie. It is often used for titles and credits since they stand out clearly against the solid color.

Color Correction _ The step in the post production process where the images are adjusted to both match subtle differences in shots and to create an overall look.

Color Curves _ A mechanism for controlling color changes, and matching colors. Color curves are set by user-adjustable lookup tables that define a color transform, which may be applied to each primary additive or subtractive color in the image.

Color Depth _ The number of bits per pixel used to define color. Different monitor systems and software can display colors in 1 bit (black and white), 4 bits (16 colors), 8 bits (256 colors), 16 bits (65,536 colors), 24 bits (16.4 million colors), and 32 bits (16.4 million colors with 256 levels of transparency).

Color Difference Signal _ Information regarding luminance and chrominance for each pixel is necessary to create video images. In video technology, this information is commonly sampled in the form of a luminance signal and two color difference signals. The reason why two color difference signals are needed which together determine one certain color can be explained as follows: Imagine all producible colors within the video system as being a circular area. When positioning a reticule in the middle of this circle, each color (more detailed: each color mode) can be explained as a combination of a value on the x- and y-axis. In common practice, the value pairs U/V, Cr/Cb and R-Y/B-Y are referred to as color difference signals and used as if they all had the same meaning, although this is not true in reality, to be exact.

Color Dynamics _ The whitest whites, reddest reds, etc. High color dynamics are a result of dynamic range/contrast ratio's. When we describe a unit as having excellent color dynamics, the practical description might be "rich colors, excellent definition, high contrast".

Color Edging _ Extraneous colors that appear along the edges of objects, but don't have a color relationship to those areas.

Color Encoder _ A device that combines the separate red, green and blue signals into one composite video signal. Also called "**colorplexer**".

Color Frame _ A sequence of four fields (2 frames) of NTSC video. Since the phase of the color subcarrier reverses every frame in NTSC (which makes the color information essentially invisible on a black-and-white receiver) two complete frames (four fields) are required to carry a complete sequence of color information. A PAL color frame consists of four frames (eight fields).

Color Fringing _ a CCD artifact caused when color filtering arrays or patterns conflict with information in a scene or image scanned or digitally photographed.

Color Gamut _ Another term for a color model or color space used to describe visible colors used in imaging. Refers to any color medium representing its own range of color, including film, a monitor, printed images or the human eye.

Color Graphics Adapter _ *CGA* - An early IBM graphics adapter card capable of producing 16 colors with any 4 available at one time.

Color Index _ A single value that represents a color by name, rather than by value.

Color Killer _ A color killer is a circuit that shuts off the color decoding if the incoming video does not contain color information. How does this work? The color killer looks for the **color burst** and if it can't find it, it shuts off the color decoding.

Color Management System _ Software that translates the colors of an original image into the truest representation obtainable on the output device. Color management works from a profile of the output device, typically a digital printer or offset press, and works backward to the source of the material such as a scanner.

Color Map _ A table showing index-to-RGB mapping that's accessed by display hardware. Each color index is read from a color buffer, converted to an RGB triple by lookup in the color map then sent to the monitor.

Color Mixing _ The artistic process of mixing color electronically.

Color Model _ Models used to describe and reproduce color.

Color Palette _ A palette is the set of available colors. For a given application, the palette may be only a subset of all the colors that can be physically displayed. For example, many computer systems can display 16 million unique colors, but a given program would use only 256 of them at a time if the display is in 256-color mode. The computer system's palette, therefore, would consist of the 16 million colors, but the program's palette would contain only the 256-color subset.

Color Phase _ The timing relationship of the color video signal. The correct color phase will produce the correct color hues.

Color Pixel Reconstruction _ An algorithm that creates a fully populated color image record from the output of a CFA-type sensor by interpolating values for each color at each pixel location.

Color Purity _ This term is used to describe how close a color is to the theoretical. For example, in the **Y'UV** color space, color purity is specified as a percentage of saturation and +/-q, where q is an angle in degrees, and both quantities are referenced to the color of interest. The smaller the numbers, the closer the actual color is to the color that it's really supposed to be. For a studio-grade device, the saturation is +/-2% and the hue is +/-2 degrees. On a vectorscope, if you're in that range, you're studio quality.

Color Red, Green, Blue and Composite Sync Outputs (RGBS) _ Analog red, green, blue levels are provided as 0.7 volt p-p video output signals and negative-going TTL level composite sync output (4 volts p-p, nonterminated and 2.3 volts p-p terminated). This matches the input standards of most data monitors and projectors. If the sync signal is on the green channel, some large screen data monitors and projectors may display a greenish tint, as well as a pulling to the right at the top or bottom. switch.

Color Replace Filter _ A filter that produces a change in the color of objects or areas within a clip based on their hue values.

Color Resolution _ The number of colors available at one time in an image, measured in terms of bits per pixel.

Color Saturation _ A measurement for determining the intensity of the colors in a video signal.

Color Separation _ An image printed with each of its channels as a separate plate. A process color separation is printed as four plates, one for each process color: cyan, magenta, yellow and black.

Color Space _ Depending on the defined reference points or limits, a color range known as color space can be defined on the basis of the spectrum of all colors existing in nature. To be able to reproduce images as detailed as possible, information regarding brightness and color from the predefined color space is necessary for each pixel to be displayed. There are various methods for being able to supply this necessary information and to define the color space. One of

them mainly used in conventional video processing is the determination of luminance values and color difference signals (R-Y, B-Y). The color space defined in such a way is most commonly referred to as YUV color space. In the field of computer graphics, images are commonly processed within the RGB color space in which all colors are defined as a mix of the three basic colors red, green and blue. In print, Cyan, Magenta, Yellow and Black (CMYK) are used. Moving pictures between these is possible but requires careful attention to the accuracy of processing involved. Operating across the media - print, film and TV, as well as between computers and TV equipment - will require conversions in color space and may result in deteriorating quality and errors.

Color Space Conversion _ The translation of color value form one color space to another. Since different media types, like video and computer graphics, use different color spaces, color space is often performed on the fly by graphics hardware.

Color Subcarrier _ The 3.58 MHz (NTSC) or 4.43 MHz (PAL) signal that carries color information. The color subcarrier is superimposed onto the luminance level. Its amplitude represents saturation and its phase angle represents hue.

Color Temperature _ Refers to scale used for rating the color quality of illumination. When a "blackbody" is heated, its color changes from black to red, yellow, blue, then white as the temperature rises. Color temperature matches the actual temperature of the heated blackbody. Measured in Kelvins (K). The temperature of daylight on a sunny day, for example, is expressed as 5500K; that of light from a tungsten lamp is expressed as 3200K to 3400K. The higher the color temperature, the bluer the light. The lower the temperature, the redder the light.

Color Timing _ The process wherein colors are referenced and alternate odd and even color fields are matched to ensure colors match from shot to shot. Most commonly found in high-end equipment, such as Betacam SP.

Coloration _ Listening term that refers to the effects of peaks and dips in an audio component's frequency response, which can result in sound that is muddy, tinny, brittle, or inaccurate in some other way. A colored sound characteristic adds something not in the original sound. The coloration may be euphonically pleasant, but it is not as accurate as the original signal.

Colorist _ An individual artist who understands color and can interface between a production's need for color treatment of images and the equipment necessary to accomplish that treatment. Colorists have traditionally worked with telecine film output, and now also work in tape to tape applications in SD and HD.

Color-Under Recording _ Separating the standard NTSC signal into luminance and modulated chrominance with sidebands. In ¾" U-Matic recordings, the luminance frequency is used to modulate an FM carrier signal to hold a 3.58 MHz to 688 kHz down-converted (heterodyned) chrominance signal with the FM carrier acting as bias (maintaining linearity in tape response), as similarly achieved in VHS and SVHS video format recording, and 8-mm video format recording (yet each with different incompatible tape formats and FM carrier frequencies). U-Matic SP recordings use a higher frequency FM carrier and a different tape formulation than the old standard U-Matic format. In each of these formats, the narrow bandwidth luminance signal requires time base correction prior to broadcast and/or mixing with other video sources, or prior to conversion into a digital signal.

Colossus _ A code-breaking computer invented as part of the secret ULTRA project in Great Britain during World War II. Colossus became operational in 1943 - a full three years before ENIAC. Its operational details are still classified today.

Com Port _ Usually a PC will have anything up to four of these (i.e. Com1 - Com4) and it's through these connections (usually on the rear panel of your PC) that attached devices can talk to your computer. Anything fitted to a Serial Port such as a Scanner, Printer or external Modem will also be allocated a Com connection. Today, to a large extend replaced by USB ports.

COM/ActiveX _ Refers to Microsoft's component software, which is based on COM objects. ActiveX technologies are based on COM; however, in the past, ActiveX has also been used as an umbrella term for COM objects.

Comb Filter _ Circuitry that separates the detail (luminance) information and the color information from the video signal-minimizing detail/color artifacts such as dot crawl and cross color. Otherwise, the television produces many small errors like crawling dots of light on the screen. The term comb, of course, is only figurative. Although comb filters are successful in reducing artifacts, they may also cause a certain amount of loss of resolution in the picture. The important thing to remember is that the comb filter is a better method for Y/C separation than chroma bandpass or chroma trap.

Combiner _ In digital picture manipulators, a device that controls the way in which two or more channels work together. Under software control, it determines the priority of the channels (which picture appears in front and which in back) and the types of transitions that can take place between them.

Combo _ A combo is a combination of moves, usually in a fighting game, that can be chained together into an unblockable sequence. Skilled players will have a multitude of combos at their command.

Command _ An instruction given to the computer by the user which is expected to be carried out.

Command Aging _ A SCSI feature that prevents the command reordering Algorithm from keeping I/O processes waiting in the command queue for extended periods of time.

Command Line Interpreter (CLI) _ A simple text-based interface for some operating systems. The CLIis composed of a single line on which the user enters short symbolic commands at a text prompt from the system. DOS and UNIX are examples of operating systems that may employ CLIs. Contrast with graphical user interface (GUI).

Command Queuing _ A feature that enables the drive to receive I/O processes from one or more initiators and execute them in an optimum sequence.

Command Reordering _ A feature that allows the drive to reorder I/O processes in the command queue, which results in minimizing the seek time and rotational latency and thus increases throughput.

Commentary Track _ A separate track of audio on the DVD that can include filmmakers, stars, etc., discussing the film as it plays.

Commodore _ One of the first personal computer companies. In 1977, Commodore Business Machines, West Chester, PA, introduced the PET computer and launched the personal computer industry along with Apple and Radio Shack. In 1982, it introduced the Commodore 64 (64K RAM) and later the Commodore 128. These were popular home computers, and over 10 million were sold. In 1985, the Amiga series was introduced, which continued to offer advanced imaging and video capabilities at affordable prices. A line of IBM-compatible PCs was also introduced, but the Amiga series was Commodore's mainstay until May 1994, when it went into bankruptcy.

Common Image Format _ Describes a standard definition image of 352 x 240 pixels for computers. For HDTV, 1920 x 1080i at 50 and 60 fields/s, and 1920 x 1080p at 24, 50 and 60 frames/s are all designated as common image formats.

Common Mode Rejection (CMR) _ A measure of how well a differential amplifier rejects a signal that appears simultaneously and in phase at both input terminals. As a specification CMR is expressed as a dB ratio at a given frequency.

Common Operating Environment _ A uniform configuration of hardware and software throughout an organization. It is designed to eliminate software and data incompatibilities and improve troubleshooting. It implies the use of the same primary applications and Web browser as well as the same operating system, database management system and other system software.

Communications Channel _ In a communications system, the channel is the medium or carrier over which the signal is transmitted.

Communications Program _ Software that manages the transmission of data between computers, typically via modem and the serial port. Such programs were very popular for connecting to BBSs before the Internet took off. Comm programs include several file transfer protocols and can also emulate dumb terminals for dialing into minis and mainframes.

Compact Flash Card _ Rewritable removable memory or function card developed by SanDisk in 1994. They can be slotted into and out of a device as and when the user requires them. Flash memory is a safe, highly reliable form of storage that doesn't need power to hold the images after they are saved. It won't erase the images unless the user chooses to do so. It is available in sizes from 4MB up to 1GB.

Compander _ A compander is a compressor/expander, a combination of signal compression and expansion. The compander attenuates the input signal above the threshold as well as the level below the width. For very dynamic material, this program allows you to retain the dynamic range without having to be concerned with excessive output signal levels and clipping.

Compatible _ means "get along together OK"; e.g. personalities who "fit" well enough together that there are no recurrent serious problems. The word entered computer usage with the licensing of other companies to copy the IBM personal computer: these computers were described as "IBM compatible", meaning that they would be able to run the same software and handle the same peripherals. Compatibility has varied, however, because although "IBM compatible computers" are similar, they are not exactly the same. Apple licensed other companies to produce computers which would run the Macintosh operating system, some years back, but it just didn't work!. Fortunately, cross-platform compatibility has improved a great deal in recent years, so files can be transferred between different operating systems quite readily.

Compilers _ Programs that translate symbolic programs to binary or machine instructions for a given processor. Compilers are designed for both specific high-level or symbolic programming languages and target processors. A compiler translates the complete source program into an executable object program for that processor.

Complete Systems _ Non-linear editing systems are offered in different versions. A complete system offers all components required for full operation of an editing system with the exception of peripherals such as video recorders. The user receives a completely configured, operable computer system.

Component Signals _ To display video images, information on brightness and color is required for each pixel. In video technology, this information is commonly sampled by means of one brightness signal and two color difference signals. The three signals are also referred to as component signals.

Component Video _ In producing a color picture from light, our color television system starts out with three channels of information; Red, Green, & Blue (RGB). This is certainly one form of component video. In the process of translating these channels for use in distribution, they are often first converted to Y, R-Y, and B-Y or Y P_b P_r. This is another form of component video. The term component describes a number of elements that are needed to make up the picture. It could be argued that an S video signal is also a component signal. A composite video signal on the other had contains all the information needed for the color picture in a single channel of information. Much higher program production quality is possible in the component domain because analog compression is used to place the three channels of component information into the single channel of composite information. Once that compression take place it is extremely difficult to get back the original quality of the component signal. One of the advantages DVD has over the laserdisc format is that it is component based.

Component Video Connections _ Now common on most premium TV sets, component video uses very little compression. Component video connections have 1 cable for luminance, (black-and-white) information, and 2 for color difference signals.

Composite Audio _ Another name for the standard RCA-jack audio outputs included on most DVD players and on all consumer-level audio components. On most stereo components, this is a red-colored right output or input, and a white-colored left output or input.

Composite Digital _ A digitally encoded video signal, such as NTSC or PAL video, that includes horizontal and vertical synchronizing information.

Composite Sync _ A signal combining horizontal and vertical sync pulses and equalizing pulses, with no picture information and no signal reference level. Composite sync is sometimes referred to as "C", "S" (as in RGBS) or "HV" (as on some connector panels).

Composite Video _ Luminance and chrominance are combined along with the timing reference "sync" information using one of the coding standards - NTSC, PAL or SECAM - to make composite video. The process, which is an analogue form of video compression, restricts the bandwidths (image detail) of components. In the composite result color is literally added to the monochrome (luminance) information using a visually acceptable technique. As our eyes have far more luminance resolving power than for color, the color sharpness (bandwidth) of the coded single is reduced to far below that of the luminance. This provides a good solution for transmission but it becomes difficult, if not impossible, to accurately reverse the process (decode) into pure luminance and chrominance which limits its use in post production.

Composite Video Connections _ Also known as RCA jacks.. They carry the entire video signal, including luminance on a single cable.

Compositing _ Simultaneous multi-layering and design for moving pictures. Modern video designs often use many techniques together, such as painting, retouching, rotoscoping, keying/matting, digital effects and color correction as well as multi-layering to create complex animations and opticals for promotions, title sequences and commercials as well as in program content. Besides the creative element there are other important applications for compositing equipment such as image repair, glass painting and wire removal - especially in motion pictures. The quality of the finished work, and therefore the equipment, can be crucial especially where seamless results are demanded. For example, adding a foreground convincingly over a background - placing an actor into a scene - without any tell-tale blue edges or other signs that the scene is composed. The better the compositing results are supposed to be, the higher the system requirements. High end applications require 8 or 10 bit signal processing to maintain the quality throughout various generations and to ensure high-quality chroma keys. The quality of a compositing system also depends on the number of layers, i.e. focal planes that can be simultaneously processed and on how fast the composition can be rendered. Sometimes also called "vertical editing"

Compostie _ Composite video signals use a single "RCA" cable and squeezes all four video signals into one, causing poor color fidelity and lower resolution video. The problem with a composite video signal is that the combined Y and C signals overlap in a frequency range starting at about 2.1 MHz and higher. When the composite video signal arrives at a monitor for display, or a VCR that stores video as separate Y and C signals, these overlapping signals must be separated again. The entire process described previously must be reversed. Once the Y and C signals are separated then the C signal is demodulated back into the two I & Q signals. Finally, the R, G, B signals may be recovered by decoding (solving) the three (Y, I, Q) equations. The R, G, B signals are then used to drive the Cart's three separate electron beams, one for each color. The most difficult part of this process is finding a way to separate the overlapping Y and C signals that were added together to form a composite signal. If the Y and C signals can be kept separate everywhere in the video chain, then this complex, error prone problem can be avoided.

Compressed Resolution _ Most video projectors automatically accept images that are of greater resolution than the native (true) resolution of the projector. The resulting image is scaled to fit the native resolution of the projector using a variety of scaling algorithms. Not all projectors use the same compression algorithms; therefore, the quality of compression can vary. The nature of compression in a digital device means that some image content is lost.

Compressed Serial Digital Interface (CSDI) _ A way of compressing digital video for use on SDI-based equipment proposed by Panasonic. Now incorporated into Serial digital transport interface.

Compressing _ Act of discarding redundant or semi redundant information from a file in order to reduce its size. Various methods encoding digital information can be used to reduce the size of an original digital recording by eliminating redundant information or information that is viewed as unnecessary or not critical. For example a picture may be compressed by anything up to 40% but a text document will compress down to 80% of its original size.

Compression (audio) _ Reduction of bandwidth or data rate for audio. Many digital schemes are in use, all of which make use of the way the ear hears (e.g. that a loud sound will tend to mask a quieter one) to reduce the information sent. Generally this is of benefit in areas where bandwidth and storage are limited, such as in delivery systems to the home.

Compression (video) _ The process of reducing the bandwidth or data rate of a video stream. The analogue broadcast standards used today, PAL, NTSC and SECAM are, in fact, compression systems which reduce the data content of their original RGB sources. Digital compression systems analyze their picture sources to find and remove redundancy both within and between picture frames. The techniques were primarily developed for digital data transmission but have been adopted as a means of reducing transmission bandwidths and storage requirements on disks and VTRs. A number of compression techniques are in regular use, these include ETSI, JPEG, Motion JPEG, DV, MPEG-1, MPEG-2 and MPEG-4. Where different techniques are used in the same stream, problems can occur and picture quality can suffer more than if the same method is used throughout. The MPEG-2 family of compression schemes which was designed for program transmission is also being targeted for studio applications via "Studio MPEG". While there is much debate, and new technologies continue to be developed, it remains true that the best compressed results are produced from the highest quality source pictures. Poor inputs do not compress well. Noise, which may be interpreted as important picture detail, is the enemy of compression.

Compression Artifacts _ Compacting of a digital signal, particularly when a high compression ratio is used, may result in small errors when the signal is decompressed. These errors are known as "artifacts" or unwanted defects. The artifacts may resemble noise (or edge "busyness") or may cause parts of the picture, particularly fast moving portions, to be displayed with the movement distorted or missing.

Compression Ratio _ The ratio of the size of data in the non-compressed digital video signal to the compressed version. Modern compression techniques start with the ITU-R 601 component digital television signal so the amount of data of the non-compressed video is well defined - 76 Gbytes/hour for the 525/60 standard and 75 Gbytes/hour for 625/50. In addition, a variety of sampling systems are used, 4:2:2 ("Studio" MPEG-2), 4:2:0 (MPEG-2), 4:1:1 (DVCPRO), etc. The compression ratio should not be used as the only method to assess the quality of a compressed signal. For a given technique, greater compression can be expected to result in worse quality but different techniques give widely differing quality for the same compression ratio. This is due to the fact that some compression methods work more effectively and produce better results than others. In the case of MPEG, one no longer talks of compression rates (e.g. 5:1) based on a different way of data reduction, but of data rates (such as 25Mbits/s, for example). In general, the relation between image quality and storage capacity is more favorable in the case of MPEG than in the case of M-JPEG. The only sure method of judgment is to make a very close inspection of the results and, where appropriate, re-assessing their quality after onward video processing.

Compression Technology _ allows the delivery of more information in less space. This technology enables us to send multiple video channels over standard cable lines and allows CD-quality sound and a full-length feature film to fit on a standard-sized CD.

Compression, Data _ Transforming data for storage so that the stored data will take less memory space than the raw or uncompressed data. Lossless compression methods provide for recovery of the exact original data; whereas lossy compression methods involve some loss of detail when the data is uncompressed.

Compression/Decompression _ The reduction of image file size for processing, storage, and transmission. The quality of the image may be affected by the compression techniques used and the level of compression applied. Decompression is the process of retrieving compressed data and reassembling it so that it resembles its original form before compression. There are two types of compression: *Lossless* compression is a process that reduces the storage space needed for an image file without loss of data. If an image has undergone lossless compression, it will be identical to the image before it was compressed. Primarily used with bitonal images. *Lossy* compression is another process that reduces the storage space needed for an image file, but it discards information (infor-

mation that is "redundant" and not perceptible to the human eye). If an image that has undergone lossy compression is decompressed, it will differ form the image before it was compressed, even though the difference may be difficult for the human eye to detect. There are both standard and non-standard compression techniques available. In general, it is better to employ a compression technique that is supported by standards, non-proprietary, and maintained over time. In selecting a compression technique, it is necessary to consider the attributes of the original. Some compression techniques are designed to compress text, others are designed to compress pictures.

Compressor _ A compressor provides a form of automatic level control. It attenuates high levels, thus effectively reducing the dynamic range, making it much easier to control signals and set appropriate fader levels. Reducing the dynamic range also means that recording levels can be set higher, therefore improving the signal-to-noise performance. Limiting is an extreme form of compression, where the output signal is sharply attenuated so that it cannot exceed a particular level.

CompuServe GIF _ An acronym for Graphics Interchange Format, which is a raster file format that allows Indexed Color, Grayscale, or Bitmap images to be easily transported between computer platforms. GIFs are currently the most widely used graphic format on the Internet.

Computational _ Having to do with calculations. Something that is "highly computational" requires a large number of calculations.

Computational Linguistics _ The science of the structure of human language as applied to the computer. The terms "computational linguistics" and "natural language processing" are often assumed to be synonymous; however, the former refers more to the science, and the latter more to its actual use in the field.

Computer _ A general-purpose machine that processes data according to a set of instructions that are stored internally either temporarily or permanently. The computer and all equipment attached to it are called hardware. The instructions that tell it what to do are called "software." A set of instructions that perform a particular task is called a "program" or "software program."

Computer Animation _ Use of computers to create animations. There are a few different ways to make computer animations. One is 3D animation. One way to create computer animations is to create objects and then render them. This method produces perfect and three dimensional looking animations. Another way to create computer animation is to use standard computer painting tools and to paint single frames and composite them. These can later be either saved as a movie file or output to video. One last method of making computer animations is to use transitions and other special effects like morphing to modify existing images and video.

Computer Architecture _ The design of a computer system. It sets the standard for all devices that connect to it and all the software that runs on it. It is based on the type of programs that will run (business, scientific) and the number of them run concurrently. It specifies how much memory is needed and how it is managed (memory protection, virtual memory, virtual machine). It specifies register size and bus width (16-, 32-, 64-bit) and how concurrency is handled (channels, bus mastering, parallel processing). Its native language instruction set stipulates what functions the computer performs and how instructions are written to activate them. This determines how programs will communicate with it forever after. The trend toward large, complicated instruction sets has been reversed with RISC computers, which use simpler instructions. The result is a leaner, faster computer, but requires that the compilers generate more code for complex functions that used to be handled in hardware. Fault tolerant operation influences every aspect of computer architecture, and computers designed for single purposes, such as array processors and database machines, require special designs.

Computer Graphics _ Any types of images created using any kind of computer. There is a vast amount of types of images a computer can create. Also, there are just as many ways of creating those images. Images created by computers can be very simple, such as lines and circles, or extremely complex such as fractals and complicated rendered animations.

Computer Input _ Some HDTV sets have an input like SVGA or VGA that allows the TV sets to be connected to computers.

Computer Networks _ Networks connect computers in our offices, on our campuses,

and link us to computers around the world. Computer networks have created a fully connected global village in which almost instantaneous communication is not only possible, but efficient and relatively inexpensive.

Computer on a Chip _ A single chip that contains the processor, RAM, ROM, clock and I/O control unit. Hundreds of millions of them are used each year for a myriad of applications from automobiles to toys. A computer on a chip is also called a "microcontroller" or "MCU."

Computer Revolution _ Refers to the tremendous impact computers have had on society. One might say that the real "revolution" started in the late 1970s with the advent of personal computers, because consumers would become customers, not just businesses. Advances in semiconductors and electronics led to improvements in portable and handheld devices as well as the telecommunications industry. All of these technologies allowed the Internet to flourish, which has truly been a revolution in communications. The computer is at the heart of all of it.

Computer Science _ The field of computer hardware and software. It includes systems analysis & design, application and system software design and programming and data-center operations.

Computer System _ The complete computer made up of the CPU, memory and related electronics (main cabinet), all the peripheral devices connected to it and its operating system. Computer systems fall into two broad divisions: clients and servers. Client machines fall into three categories from low to high end: laptop, desktop and workstation. Servers range from small to large: low-end servers, midrange servers and mainframes.

Computer Vision _ Intelligent hardware/software systems that recognize features from and interpret visual images. A computer vision system, for example, may process photographs or video for objects of interest. An area of research in artificial intelligence.

Computer-video Interface _ A device that converts the "nonstandard" video output of computer systems to a "standard" RGB analog signal, which can then be connected to a compatible data monitor or projector.

Concatenation _ Linking together (of systems). Although the effect on quality resulting from a signal passing through many systems has always been a concern, the use of a series of compressed digital video systems is, as yet, not well known. The matter is complicated by virtually all digital compression systems differing in some way from each other-- hence the need to be aware of concatenation. For broadcast, the current NTSC and PAL analog compression systems will, more and more, operate alongside digital MPEG compression systems used for transmission and, possibly, in the studio. Even the same brand and model of encoder may encode the same signal in a different manner.

Conditional Access _ Digital television signals can be scrambled in such a way that they cannot be understood by a conventional decoder. Only when unscrambled by a special system can the original pictures be seen by the viewer. By controlling the operation of the de-scrambling system through the use of a pre-paid access card, or by a transmitted code, the broadcaster can control access to a particular channel or service. Conditional access can be used to control many things from pay-per-view subscription through to target viewing areas.

Conditional Processing _ The ability of the computer system to choose alternative courses of action while the program is executing based on evaluating the current status of data.

Confidence Monitoring _ Listening directly from a recording medium to ensure the program material is being recorded correctly. Most analog recorders have a playback head trailing the record head, allowing you to hear the material directly after it has been recorded. Professional DAT recorders usually have four heads for confidence monitoring, as do a number of the modular digital multitrack recorders. Hard disk recorders offer their own form of confidence monitoring.

Configuration _ Means all of the parameters and settings that a computer program or hardware device needs in order to work. If we talk about configuring a device, we are talking about setting it up to work properly.

Conforming _ The process wherein an off-line edited master is used as a guide for performing final edits.

Connectivity _ a) The ability to connect electronic imaging components together so they function in harmony. **_ b)** *point-to-point* Network connections that provide direct connection between pairs of network nodes (computers attached to the network). **_ c)** *shared* Networks in which network nodes share connections to most (or all)other nodes on the network.

Console _ a) A dedicated video games machine such as the Microsoft Xbox and Sony Playstation. **_ b)** Alternative term for a mixer.

Consolidate _ Consolidate is a function included in some editing systems to delete superfluous data that were not used in the current project. The remaining data are written onto the hard disk in such a way that the shortest possible access times are realized. The write/read head does not permanently have to be moved between the different sectors, thus making the system faster and more efficient. This is of particular importance when connected storing media with low compression rates are operated at maximum efficiency.

Consolidated Server _ A multiprocessor computer system. They typically consist of a series of individual, rack-mounted or modularized CPU boards that use fault tolerant components. They generally share common disk storage and SMP versions share a common memory pool. What differentiates them is how efficiently they are controlled by a single administrative console, their degree of fault tolerance and how easily failed components can be replaced without shutting down the entire system. Although typically built on Intel-based motherboards with enhanced features, in effect, the functions of a consolidated server have been employed in mainframes for years. The consolidated server represents the evolution of x86 CPUs for mission critical use.

Constant Angular Velocity _ A characteristic of some disk drives. CAV disk drives and their media are organized so the drives can maintain a constant rotational speed as data is written or read. Varying the density of data according to where it is stored on the disk allows for constant data transfer rates in CAV drives. Contrast with CLV drives. The same feature was a part of Laser disk design.

Constant Bit Rate _ Constant bit rate (CBR) means that a bitstream (compressed or uncompressed) has the same number of bits each second.

Constant Linear Velocity _ A characteristic of some disk drives. CLV disk drives and their media are organized so the drives vary their spin rate when reading or writing data depending upon where the data is stored on the disk. Contrast with CAV drives. While CLV format disks require more complicated mechanisms, they can achieve greater overall data density than CAV drives since the latter waste a good bit of storage space near the outer edge of the disk because the data there is stored with lower density rates. The same feature was a part of Laser disk design.

Constrain _ To restrict the movement of a tool or selection by holding the *shift* key. For example, you constrain when scaling a selection to maintain its aspect ratio or when drawing a line to keep it horizontal or vertical.

Container _ In video terminology container or container format means a "wrapper" format, which doesn't define what compression formats *(in other words, what codecs)* the video file within a specific container format includes, but rather defines how the video, audio and other possible data is stored within the container. Best-known container formats are AVI and ASF.

Content _ Content refers to the audio, video or any other media assembled and produced for broadcast, Webcast, or other form of distribution.

Content Big Bang _ Explosion of digitized information resulting from the "digital wake" of our daily lives, coupled with advances in information storage technologies and in optical networking.

Content Delivery _ The means for delivering digital-based content to the theatre. Content may be delivered via physical distribution (such as DVD), by standard geosynchronous Ku-Band satellite, or by broadband (phone, cable, Internet, fiber optics, etc.)

Content Server _ A computer that stores content for the Internet. Content (news, sports, references, etc.) is differentiated from transaction data such as customer records and orders.

Context Switching _ In a multi-user operating system, tasks are often interrupted temporarily to allow other users access to some of the Cup's time. When this occurs, the context of the first task must be saved and restored when the task is later resumed. This is referred to as context switching and is the basis for a successful multiuse environment.

Continuity _ In digital picture manipulators, the characteristic of location/ positioning that determines whether the motion path continues smoothly, without interruption.

Continuous Controller _ A type of MIDI message that is generated by the movement of a continuous control, such as from a pedal, wheel or breath control device.

Continuous Presence _ A feature in some videoconferencing that allows the participants to view multiple sites on the same video screen. This is a function of the codec used and not of the video switching system.

Contouring _ This is an image artifact caused by not having enough bits to represent the image. The reason the effect is called "contouring" is because the image develops vertical bands of sharp, distinct, brightness change. Very similar to banding.

Contrast _ **a)** The difference in brightness between the lightest and darkest areas of an image on the screen. _ **b)** The relative difference between the distributions of lighter and darker pixels in an image.

Contribution Quality _ The level of quality of a television signal from the network to its affiliates. For digital television this is approximately 45 Mbps.

Control Interfaces _ When controlling analogue camcorders or recorders by computer, the interface sockets of these devices are of particular importance. Consumer devices feature the Sony or Panasonic versions of control sockets, if at all. Sometimes they are also incorporated in the devices of other manufacturers. The Sony version is called LANC or Control L. For device control, Panasonic are banking on a special five-pole edit jack mainly referred to as Panasonic Edit. On the computer side, they fit into the serial port in most cases, while, on the video side, they fit the Sony LANC or Panasonic Edit jack. In the professional area, the RS - 422 and RS-232 interface generate the control contact between the computer and video worlds.

Control Track _ A signal recorded on video tape to allow the tape to play back at a precise speed in any VTR. Analogous to the sprocket holes on film.

Control Track Editing _ The linear editing of videotape with equipment that reads the control track information to synchronize the editing between two decks. Contrast with time-code editing.

Control Unit _ The component of the CPU that controls the various tasks to be performed. For example, the control unit manages the fetching and loading of the proper sequence of instructions necessary for the CPU to execute a program stored in memory.

Controller (Game) _ Any apparatus designed to provide an interface between a video game system and a player. Controllers include, but are not limited to, game pads, joysticks, steering wheels and foot pedals, keyboards and mice, and footpads designed to be stepped on.

Controller Card _ An adapter with the control electronics for one or more hard drives. Usually installed in a Bus slot in the computer.

Conventional Memory _ The 640K of memory that is available to run programs on a standard PC.

Convergence _ **a)** Merging of communications and computing technologies, making possible such things as phone calls from your laptop. One of the factors fueling mega-mergers among global media giants. _ **b)** The accuracy of the positions of the red, green, and blue beams of a color monitor or projector.

Conversion _ In computer imaging, to change a CMYK file to RGB or vice versa, or to convert one file format to another.

Conversion of Standards _ The conversion of standards refers to the process of converting video signals from one TV standard to another. The fundamental differences between the various TV systems (PAL, NTSC, Secam) lie in the number of lines, the color transmission and the carrier frequencies. The conversion of standards is implemented with special devices, whereby high levels of technical expenditure are required in order to achieve optimum results.

Convolution Coding _ The coding procedure that generates redundancy in the transmitted data stream in order to provide ruggedness against transmission distortions.

Cookies _ American name for a sweet cake, bun or biscuit. Also known as a data file that a Web Server sends to your browser when you visit a Web site. The cookie is updated each time you return and holds info about you, which may be used later.

Coordinate System _ In real life, we can tell where objects are by measuring distance between them. As for placing them, moving them, and keeping track of where they are nature has developed a pretty good system. On the computer though, we have to somehow keep track of objects in a 3D scene. Mathematicians have developed the coordinate system. You have probably learned in geometry about the X and the Y axis. Well, these two axis define a coordinate plane, that is, a two dimensional world. However, to work in three dimensions, we need one more axis, the Z axis. Each axis is like a number line. The three axis are perpendicular to each other. The point at which they intersect is called the point of origin. The point of origin is designated as 0,0,0, because it is located on the 0 point on all three axis. Now let's say that you want to define a point in space. You can do this by giving three numbers. The first one is the distance of the point from the origin in the X axis. The second one is the offset of the point from the point of origin along the Y axis, and the third on the points distance away from 0 along the Z axis.

Coprocessor _ A logic device that operates in association with a microprocessor to enhance system performance. Coprocessors are not capable of independent operation.

Copy Brush _ A means of coping one area of the screen image to another position. Also known as clone, shift and texture.

Copy Command, Operation _ A commonly used command or operation in word processing and other environments. Using this operation, text, images, sounds, etc. can be copied for temporary storage on the system's clipboard, then pasted into another location within the same document or to a location within another document.

Copy Protection _ Used on 99 percent of DVDs to prevent copying to VHS or other video formats. Home copying of DVDs to other formats is now so difficult it's practically impossible, thanks to several different copy protection procedures employed by manufacturers.

Core Logic _ The primary processing logic of a component, function or system. For example, a PC chipset provides all the core logic on the motherboard except for the CPU.

Core Storage _ A non-volatile memory that holds magnetic charges in ferrite cores about 1/16th" diameter. The direction of the flux

determines the 0 or 1. Developed in the late 1940s by Jay W. Forrester and Dr. An Wang, it was used extensively in the 1950s and 1960s. Since it holds its content without power, it is still used in specialized applications in the military and in space vehicles.

Cornea Gumbo _ Refers to a Web page that is overloaded with images and visual stimulation. There are countless Web pages that fit this description.

Corner Pinning _ A technique for controlling the position and rotation of pictures in a DVE, by dragging their corners to fit a background scene. For example to fit a picture into a frame hanging on a wall. It can also be combined with the data derived from four-point image tracking to substitute objects in moving images, for example replacing the license plate on a moving vehicle.

Country Code _ A two-character component of an e-mail or Web address that identifies a country. Computers read addresses from right to left. Thus, on encountering **sven@univ.oslo. net.se**, the message would first be sent to Sweden, since **se** is the country code for Sweden. Swedish routers would then send the message to **univ.oslo.net** where it will be waiting for Sven the next time he signs on.

Courseware _ A term referring to software products designed for educational purposes. These products typically capture subject domain knowledge for some specific area and present it in an electronic (often multimedia) format. Well - designed courseware is usually interactive, offering its user the opportunity to explore his or her own particular interests or focus within the subject domain.

CPE _ *Customer Premises Equipment* - a term used to define a class of consumer devices found in the hope that connect to a public network. Examples include a set- box, telephone, satellite receiver, personal computer with a modem, answering machines, and fax machines.

CPM _ *Continuous-Phase Modulation*.

CPS _ *Characters Per Second* - CPS is a measurement of computer throughput.

CPU _ *Central Processing Unit* - This is the main chip inside the computer. The CPU is the "brains" of the computer; the place where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

CPU Scheduler _ In a multi-user operating system, the CPU scheduler determines the schedule for various tasks to be executed by the CPU.

CPU-based Effect _ An video effect that takes advantage of computer's CPU to play back in real time.

Cracker _ A person who breaks into a computer system without authorization, whose purpose is to do damage (destroy files, steal credit card numbers, plant viruses, etc.). Because a cracker uses low-level hacker skills to do cracking, the terms "cracker" and "hacker" have become synonymous.

Crapplet _ A really terrible and useless Java applet.

Crash _ Slang term relating to malfunction of computer program. A computer crash sometimes happens when the hard drive fails or when a program locks up. It can also happen if the user opens up too many programs and fails to close them down properly, or if there is a fault on a device attached to the computer.

Crawler _ Also known as a "spider," "ant," "robot" ("bot") and "intelligent agent," a crawler is a program that searches for information on the World Wide Web. It is used to locate new documents and new sites by following hypertext links from server to server and indexing information based on search criteria.

Creepy Crawlies _ Yes, this is a real video term! Creepy-crawlies refers to a specific image artifact that is a result of the NTSC system. When the nightly news is on, and a little box containing a picture appears over the anchorperson's shoulder, or when some computer-generated text shows up on top of the video clip being shown, get up close to the TV and check it out. Along the edges of the box, or along the edges of the text, you'll notice some jaggies "rolling" up (or down) the picture. That's the creepy-crawlies. Some people refer to this as zipper because it looks like one.

Crippleware _ Demonstration software with built-in limitations; for example, a database package that lets only 50 records be entered.

Cropping Tool _ The cropping tool simulates the traditional method for cropping-that is, trimming photographs.

Cross Color _ Moiré or rainbow artifacts in an encoded video picture caused when the video encoder or decoder misinterprets luma detail as color information, resulting in color being displayed where it shouldn't be. It is especially noticeable when the subject wears pinstriped clothing. Cross color effects are particularly visible in composite systems and sometimes also linked to the signal mode and the TV system.

Cross Luma, Dot Drawl, Chroma Crawl _ A video artifact that occurs when a composite video decoder incorrectly interprets chroma information (color) to be high-frequency luma information (brightness). This may appear as tiny colored dots that creep along the edges of objects.

Cross Platform Capabilities _ Software with versions available on more than one type of computer hardware (e.g. Macintosh and PC) and designed so that files created by the software on one hardware platform can be opened by the software on the other platform, is referred to as cross-platform software. Software which produces executable programs as its product (such as presentation software) is also said to have cross platform capabilities if these products can be produced for execution on more than one hardware platform (even if the software itself is not available on more than one platform).

Crosshatch _ A test pattern consisting of vertical and horizontal lines used for converging a color display device.

Crossover _ An electronic circuit that divides an audio signal into high- and low-frequency components. In many speakers, a crossover routes high-frequency sounds to satellite modules and low frequencies to the bass unit. The split point between the two is called the crossover frequency.

Crosspoint _ An electronic switch, usually part of an array of switches that allows video or audio to pass when the switch is closed.

Crosstalk _ This is caused by interference between two signals, usually from an adjacent channel, which adds an undesired signal to the desired signal. Crosstalk is caused by magnetic induction or capacitive coupling, and can occur when there are grounding problems or improper cable shielding. Video symptoms include noise and ghosting, while audio symptoms include signal leakage. Also refers to the distortion that occurs when some signal from a music source that you are not listening to leaks into the circuit of the source that you are listening to.

CRT _ Cathode Ray Tube - A vacuum tube that produces light when energized by the electron beam generated inside the tube. A CRT has a heater element, cathode, and grids in the neck of the tube, making up the "gun". An electron beam is produced by the gun and is accelerated toward the front display surface of the tube. The display surface contains phosphors that light up when hit by the electron beam. The CRT is more commonly known as a picture tube.

Crusoe Processor _ An x86-based CPU chip from Transmeta that is designed for Internet appliances and other handheld devices that require batteries. It consumes significantly less power than mobile x86 chips from Intel, AMD and others because it places more of the processing burden on the software. Designed to run Windows and Linux applications, Crusoe uses a software translation layer known as "Code Morphing" that turns x86 instructions into Crusoe instructions. This translation layer allows the chip to be used for other instruction sets as well.

CSDI _ compressed serial digital interface, a standard for signal interchange used for sending compressed data through the non-compressed SDI interface.

CSPS _ Constraint System Parameters Stream - An MPEG-2 program stream that conforms to the founds specified in the MPEG-2 system layer specification.

CSS _ In video world, CSS means an annoying, relatively weak encryption scheme found on most DVD-Video discs. Historically CSS encryption was cracked back in 1999 and first tool which allowed users to circumvent it *(although it didn't exactly crack the CSS, but instead used leaked decryption keys)* was called DeCSS.

CT _ Continuous Tone _ a) A file format used for exchanging high-level scan information. Also called contone. A CT file uses one byte each for its RGB values, allowing up to 256density levels per color and more than 16 million different combinations of colors. _ **b)** Clock-Time and Date, Coordinated Universal Time (UTC) code can be used to set the clock to the exact time as displayed on the receiver.

CTDM _ Compressed Time Division Multiplex - A method of processing two video signals into one. Used in the Betacam recorder with playback through viewfinder for checking the tape has recorded properly.

Cuckoo's Egg _ A music file that is named erroneously as a joke. For example, you download something you expect to be heavy metal and it is really elevator music.

Culling _ The process of eliminating a front or back face of a polygon so that it isn't drawn. This saves on render time.

Cursor _ the mouse-point cursor, which appears whenever you are moving the mouse around on the screen (outside a document) is the most common shape of the cursor (which literally "runs" around); usually a pointer of some shape. When working with keyboard letters (e.g. word-processing), the mouse-point cursor is a dog-bone-shape standing on end, and there is also a mark-your-place straight-line cursor, which flashes on and off to show where you are in your document (you can move this around with keyboard arrows, or click the dog-bone cursor in the place you want). In a spreadsheet, the cursor is usually a solid white "plus" sign. Drawing and painting programs will provide a variety of cursor shapes, to indicate which function of the program you are using (e.g. a paintbrush). A hand-shaped cursor means an active link on which you can click to go somewhere else.

Custom-cut CD _ An audio CD or CD-ROM that is cut into a non-round shape after it is pressed by the manufacturer or recorded on a CD-R. To avoid vibration in the drive, the shape is balanced as much as possible. Audio CD drives spin their discs more slowly than CD-ROM drives and can tolerate more out-of-round designs. Custom-cut CDs hold considerably less music, video or data than a full-sized disc. They fit in standard drive trays, but do not work with the feed drives that are used in automobiles.

Cut (edit) _ A transition at a frame boundary from one clip to another. On tape a cut edit is performed by recording (dubbing) the new clip at the out-point of the last, whereas with true random access editing no re-recording is required - there is simply an instruction to read frames in a new order. Simple non-linear disk systems may need to shuffle their recorded data in order to achieve the required frame-to-frame access for continuous replay. The editable frame boundaries may be restricted by video coding systems, PAL, NTSC, SECAM and MPEG-2. Non-compressed component video and that compressed using only I-frame only compression (e.g. motion JPEG) can be edited on any frame boundary without additional processing.

Cut/paste _ To cut out an image or line element, usually by masking it, and repositioning the elements(s) elsewhere.

Cut-off Frequency _ The frequency above or below which attenuation begins in a filter circuit.

Cutscenes _ In the world of computer games, cutscenes are periods of dramatic development that intersect the action sequences in a game. They are rendered in still pictures or video and are usually accompanied by some type of dialogue. In most action games, cutscenes serve as the only form of plot progression.

CVD _ *China Video Disc* - One of the original three applicants to replace Video CD and sponsored mostly by Chinese government back in late 1990s. Eventually it didn't win the competition - SVCD became the 2nd generation video disc format in China and in the rest of the Asia. Anyway, as it gained some popularity and is virtually identical to SVCD, most of the DVD players which support SVCD, support also CVD. CVD's main differences to SVCD are the fact that it uses different subtitle format and the fact that it uses 352x480/576 resolution instead of SVCD's 480x480/576. This makes is ideal format for storing data on CD waiting to be moved to DVD-R, because DVD-Video specs know CVD's native resolution - and don't recognize SVCD's resolution. So, by encoding movies directly to CVD format, you can store them on CD and play them with DVD player and at later date, transfer the movie to DVD-R without re-encoding it.

CX Noise Reduction _ used primarily in the analog audio tracks of laserdiscs. This is a level sensitive audio noise reduction scheme that involves compression, on the encode side, and expansion, on the decode side. It was originally developed for CBS for noise reduction on LP records and is a Trademark of CBS Inc. The noise reduction obtained by CX was to be better than Dolby B3 for tape, but remain unnoticeable in playback if decoding didn't take place. A modified CX system was applied to the analog audio tracks of the laserdisc to compensate for interference between the audio and video carriers.

Cyber _ From *cybernetics*, it is a prefix attached to everyday words to add a computer, electronic or online connotation. The term is similar to "virtual," but the latter is used more frequently.

Cyber Café _ These are becoming very popular in big cities and in large towns throughout the world. A Cyber Café is a Snack Bar or Café that allows customers to access the Web whilst having a drink or a snack.

Cyber-age _ The high-tech era that we are living in today.

Cyberlibertarianism _ The libertarian philosophy applied to the Internet and electronic media. Libertarians believe everyone should have complete and full civil liberties.

Cybernetics _ The comparative study of human and machine processes in order to understand their similarities and differences. It often refers to machines that imitate human behavior. The term was coined by Norbert Wiener (1894-1964), one of the great mathematicians of the 20th century.

Cyberpunk _ A futuristic, online delinquent: breaking into computer systems; surviving by high-tech wits. The term comes from science fiction novels such as "Neuromancer" and "Shockwave Rider."

Cyberspace _ Term coined by William Gibson in his novel "The Neuromancer" to describe the dimension of digital communication enabled by computer networks.

Cybersquatting _ Registering an Internet name for the purpose of reselling it for a profit. One of the more notable transactions was the domain name wallstreet.com, which was registered in 1994 for $70 and sold for one million in 1999. Some people have registered every common name and name combination they can think of with the hopes of making a fortune some day.

Cyberterrorism _ An illegal incursion into a computer system that alters files and data in order to cause damage by some other means. Air traffic control has often been cited as a cyberterrorism example, in which the system's computers are altered to malfunction in some manner.

Cyborg _ *Cybernetic Organism* A being that is part human and machine.

Cycle _ One complete vibration of a sound source or its electrical equivalent. One cycle per second is expressed as 1 Hertz (Hz).

Cycle Stealing _ A CPU design technique that periodically "grabs" machine cycles from the main processor usually by some peripheral control unit, such as a DMA (direct memory access) device. In this way, processing and peripheral operations can be performed concurrently or with some degree of overlap.

Cylinder _ Most hard disk drives have multiple disk platters fixed to a common central hub. Each platter is divided into a group of sectors (like slices of a pie). An associated vertical grouping of disk sectors is referred to as a cylinder.

D Connector _ A connector with rounded corners and angled ends, taking on the shape of the letter "D". Commonly used in computers and video, most D connectors have two rows of pins. If they have more than two rows, they are usually called HD (high density) connectors.

D/A Conversion _ *Digital to analog conversion* - Term mainly referring to components for converting digital into analog signals. Digital signals must be converted into an analog format to enable presentation on a video monitor. D/A conversion is also necessary for producing nonlinear digitally edited films on an analog video tape format such as Betacam SP. Many devices, such as digital video recorders emit digital as well as analog signals.

D/A Converter _ Circuitry that converts a digital (binary) signal into an equivalent analogue waveform. In an audio system, this is done so the signal from digital storage media, such as MiniDisc, CD, or Digital Audio Tape, can be handled by analogue system components, such as the receiver and speakers. Often abbreviated to just D/A or DAC.

D/I _ *Drop and insert* - A point in the transmission where portions of the digital signal can be dropped out and/or inserted.

D1 _ A format for digital video tape recording working to the ITU-R BT.601, 4:2:2 standard using 8-bit sampling. Four digital audio channels are available. The tape is 19 mm wide and allows up to 94 minutes to be recorded on a cassette. The system is designed to achieve the highest, referent quality in video recording. Being a component recording system it is ideal for studio or post production work with its high chrominance bandwidth allowing excellent chroma keying. Also multiple generations are possible with very little degradation and D1 equipment can integrate without transcoding to most digital effects systems, telecines, graphics devices, disk recorders, etc. Being component there are no color framing requirements. Despite the advantages, D1 equipment is not extensively used in general areas of TV production, due at least partly to its high cost. The first digital video tape format, hence D1. Newer digital component formats include D5, Digital Betacam, DVCPro, Digital-S, etc.

D11 _ This is believed to be assigned to a half-inch tape format that records I-frame only 4:2:2 MPEG-2 SD video at 50 Mb/s.

D16 _ A recording format for digital film images making the use of standard D1 recorders or any uncompressed CCIR 601 device. The scheme was developed by Quantel specifically to handle DOMINO (Digital Opticals for Movies) pictures and record them over the space that sixteen 625 images would occupy. This way three film frames can be recorded or played every two seconds. Playing the recorder allows the film images to be viewed on a standard monitor; running at 16 times the normal speed, showing full motion direct from the tape.

D2 _ A format for digital tape recording in the case of which digital composite signals using the 4fsc method, as well as four sound channels are recorded on a 3/4" (19 mm) wide metal tape. The analog composite signal is quantisized at 8 bits. The maximum recording time of a D2 tape is 208 minutes. D2 is not compatible with D1. Being relatively costly and not offering the advantages of component operation the format has fallen from favor. The second digital video tape format.

D2C _ The U.S. government's term for the Ampex DD2 format.

D3 _ A VTR standard using half-inch tape cassettes for recording digitized composite (coded) PAL or NTSC signals sampled at 8 bits accompanied with four sound channels. Cassettes are available for 50 to 245 minutes. Since this uses a composite signal the characteristics are generally as for D2 except that the half-inch cassette size has allowed a full family of VTR equipment to be realized in one format, including a camcorder. The third digital video tape format...

D4 _ There is no D4. Most DVTR formats hail from Japan where 4 is regarded as an unlucky number.

D5 _ A VTR format using the same cassette as D3 but recording component signals with four sound channels is recorded on a 1/2" wide technical pure iron tape according to ITU-R BT.601 recommendations at 10-bit resolution. With internal decoding D5 VTRs can play back D3 tapes and provide component outputs. Being a non-compressed com-

ponent digital video recorder means D5 enjoys all the performance benefits of D1, making it suitable for high-end post production as well as more general studio use. Besides servicing the current 625 and 525 line TV standards the format also has provision for HDTV recording by use of about 4:1 compression (D5 HD).

D5 HD _ A D5 VTR able to handle high definition signals. Using around 4:1 compression the signals connect via an HD SDI link. D5 HD can be multiformat, operating at both DTV and HDTV standards. It can replay 525-line D5 as well as D5 HD cassettes. Formats include 480/60i, 1080/24p, 1080/60i, 1080/50i, 1035/60i and 720/60p. The recorder can also slew between 24 and 25 Hz frame rates for PAL program duplication from a 1080/24p master. Cassette recording times vary according to format, the longest is 155 minutes for 1080/24p.

D6 _ A format for digital tape recording in the case of which a digital HDTV component signal as well as 12 audio channels are recorded on an 3/4" (19 mm) wide technical pure iron tape at 1.88 GBps (1.2 Gbps). D6 is based on a D1 drive and is currently the only High Definition recording format defined by a recognized standard. The Philips VooDoo Media Recorder is based on D6 technology. D6 accepts both the European 1250/50 interlaced format and the Japanese 260M version of the 1125/60 interlaced format which uses 1035 active lines.

D7 _ Official name under which the DVCPRO recording format developed by Panasonic is standardized.

D8 _ The Television Recording and Reproduction Technology Committee of SMPTE decided to skip D8 because of the possibility of confusion with similarly named digital audio or data recorders (DA-88). In general practice, this abbreviation is becoming the short form of the video tape format DIGITAL 8 developed by Sony. Digital 8 compresses video using standard DV compression, but records it in a manner that allows it to use standard Hi-8 tape. The result is a DV "box" that can also play standard Hi-8 and 8 mm tapes. Besides the width of the tape material (8 mm for Digital 8, 6.35 mm for DV) Digital 8 differs from DV in that it only requires six tracks for one image due to the used 8 mm tape (DV_ 12 Tracks). Like DV, Digital 8 records the sound either at 12 bits/32 kHz (4 Tracks) or at 16 bits/48 kHz (2 Tracks). On playback, ana-

log tapes are converted to a 25 Mbps compressed signal available via the i-Link digital output interface. Playback from analog tapes has limited video quality.

D9 (Formerly Digital-S) _ A 1/2-inch digital tape format developed by JVC which uses a high-density metal particle tape running at 57.8mm/s to record a video data rate of 50 Mbps. The tape can be shuttled and search up to 32x speed. Video sampled at 4:2:2 is compressed at 3.3:1 using DCT-based intra-frame compression. Two tracks are always written simultaneously. One frame consists of 12 adjacent diagonal tracks in the individual segments of which video, subcode and up to four PCM audio tracks are located. Audio channels are recorded at 16-bit, 48 kHz sampling; each is individually editable. The format also includes two cue tracks. Some machines can play back analog S-VHS.

D9 HD _ A high definition digital component format based on D9. Records on 1/2-inch tape with 100 Mbps video.

DA-88 _ A Tascam-brand eight track digital audio tape machine using the 8 mm video format of Sony. It has become the de facto standard for audio post production though there are numerous other formats, ranging from swappable hard drives to analog tape formats and everything in between.

DAB _ *Digital Audio Broadcast* - DAB, as designed for implementation in Europe, is broadcast terrestrially. It is received using a tiny non-directional stub antenna. It provides CD-like quality radio programs without the annoying interference and signal distortion associated with mobile radios. In addition, the system can offer text, pictures, data and even motion video.

DAC _ *Digital to Analogue Converter* - Device for transforming digital data into an analogue signal. Each input digital number, or word, is converted to a responding analogue level.

Daemon _ Pronounced "demon." A UNIX program that executes in the background ready to perform an operation when required. Functioning like an extension to the operating system, a daemon is usually an unattended process that is initiated at startup. Typical daemons are print spoolers and e-mail handlers or a scheduler that starts up another process at a designated time. The term comes from Greek mythology meaning "*guardian spirit*."

DAF _ *Done, Arranged, Fixed*.

Daisy Chain _ Term used to describe serial electrical connection between devices or modules.

Damping _ Refers to the ability of an audio component to stop after the signal ends. For example, if a drum is struck with a mallet, the sound will reach a peak level and then decay in a certain amount of time to no sound. An audio component that allows the decay to drag on too long has poor damping and less definition than it should. An audio component that is overdamped does not allow the initial energy to reach the full peak and cuts the decay short. Boomy or muddy sound is often the result of underdamped systems. Dry or lifeless sound may be the result of an over-damped system.

DAO _ *Disc At Once* - a recordable CD method where the session is recorded in one pass without interruption.

Dark Current _ CCD pixels collect signal-charges in the absence of light over time, which can vary from pixel to pixel, and the result is known as dark current or noise.

DARS _ *Digital Audio Radio Service* - Part of the DAB system.

DAT _ *Digital Audio Tape* - an audio, 4mm tape format that uses linear digital encoding to produce audio with the dynamic range and clarity of a CD on a cassette that is 30% smaller than a regular audiocassette. It records digital sound with a sampling frequency of 48 KHz and a resolution of 16 (20) bits. It is also capable of directly recording the 44.1 KHz CD digital audio format. Often used for mastering soundtracks and recording musical compositions. The commonly used DAT machines are more correctly known as R-DAT because they use a rotating head similar to a video recorder. Digital recorders using fixed or stationary heads (such as DC_ C) are known as S-DAT machines. In computers, it is often used for archiving or backing up data and may be referred to as DDS (Digital Data Storage).

Dat File _ Digital Audio Tape File.

Data _ **a)** A representation of facts, concepts, or instructions in a format suitable for communication, interpretation, or processing by human or automated means. _ **b)** Any representations, such as characters or analog quantities, that have meaning. _ **c)** Any type of information that is created or changed whilst working on the computer. _ **d)** May refer only to data stored in a database in contrast with text in a word processing document.

Data Area _ In ISO 9660, the space on a CD-ROM where the user data is written. It begins at the physical sector address 00_02_16.

Data Broadcast _ The one-way transmission of digital data directly to TVs and PCs. Using cable, satellite and the unused bandwidth in the VHF TV spectrum, data broadcast can deliver news, weather, stock prices, sports scores, music, video and even Web pages. The user's set-top box functions as a tuner to the desired information.

Data Compression _ Encoding data to take up less storage space. Digital data are compressed by finding repeatable patterns of binary 0s and 1s. The more patterns can be found, the more the data can be compressed. Text can generally be compressed to about 40% of its original size, and graphics files from 20% to 90%. Some files compress very little. It depends entirely on the type of file and compression algorithm used. There are numerous compression methods in use. Two major technologies are Huffman coding and Lempel-Ziv-Welch (LZW), representing examples of the statistical and dictionary compression methods. When a compression algorithm is packaged for use for a specific platform and file format, it is called a "codec" (compressor/decompressor). ADPCM, PCM and GSM are examples of codecs for sound, and Indeo, Cinepak and MPEG are examples of codecs for video. In the DOS/Windows world, PKZIP is the most widely used compression application.

Data Conversion _ Changing from one file type to another. There are many data conversion programs on the market that support a wide number of text, database, spreadsheet and graphics formats. If a text document, database or spreadsheet format is not supported in a packaged conversion program, the textual data within the file can be converted if the application that created it is available and it can export its contents to ASCII text; however, page format settings as well as macros and other attributes will be lost. If the application or the "export to ASCII" option is not available, the only recourse is to have a custom conversion program written from scratch. If there is no written documentation available for the format, the job will be a tedious one, but it can be done unless the format is inherently encrypted.

Data Glove _ A glove used to report the position of a user's hand and fingers to a computer.

Data Independence _ Techniques that allow data to be changed without affecting the applications that process it. There are two kinds of data independence. The first type is data independence for data, which is accomplished in a database management system (DBMS). It allows the database to be structurally changed without affecting most existing programs. Programs access data in a DBMS by field and are concerned with only the data fields they use, not the format of the complete record. Thus, when the record layout is updated (fields added, deleted or changed in size), the only programs that must be changed are those that use those new fields. The second type is data independence for processing. This means that any data that can possibly be changed should be stored in a database and not "hard wired" into the code of the program. When values change, only the database item is altered, which is a simple task, rather than recompiling programs.

Data Integrity _ The quality of correctness, completeness, wholeness, soundness and compliance with the intention of the creators of the data. It is achieved by preventing accidental or deliberate but unauthorized insertion, modification or destruction of data in a database. Data integrity is one of the six fundamental components of information security.

Data Link Protocol _ In communications, the transmission of a unit of data from one node to another (OSI layer 2). It is responsible for ensuring that the bits received are the same as the bits sent.

Data Monitor _ A display device that uses digital video, such as that from a computer. A monitor with horizontal scan capability between 15.75 kHz and 36 (42) kHz. Data monitors and projectors are commonly associated with composite video, from IBM CGA through VGA, and Apple/Macintosh computer input sources.

Data Pipe _ A communications channel (line, wire, etc.) that is used to transmit data rather than voice.

Data Processing _ Processing information by machines. Data processing was the first name used for the information technology business, and it is still used as an umbrella title. In the early days, it meant feeding punched cards into tabulating machines. Then computers followed.

Data Rate _ The amount of data per second that is transferred from one part of your computer to another. In digital video, the data rate of your source is very important - CD-ROMs have lower data rates than hard disks. The data rate of the Internet is very low. Sometimes the rate is given in kilobits per sec (Kbps) or megabits per second (Mbps), such as when talking about networks. Sometimes it's given in kilobytes per second (KBps) or megabytes per second (MBps), as when we say a CD can deliver 150 MB/sec.

Data Recorder _ Recorders that enable recording and playing of digital data by means of a magnetic tape. Data recorders are generally used for archiving digital data permanently as well as for backup purposes. They usually include a high degree of error correction to ensure that the output data is absolutely correct and, due to their recording format, the data is not easily editable. There are, however, also data recorders that are used in video technology, for example in the field of server technology or archiving of transmitted TV programs. Additional coder/decoder to transfer mere data into displayable video signals are however necessary. Different drives and formats such as DST and DLT are used.

Data Sharing _ The ability to share the same data resource with multiple applications or users. It implies that the data are stored in one or more servers in the network and that there is some software locking mechanism that prevents the same set of data from being changed by two people at the same time. Data sharing is a primary feature of a database management system (DBMS).

Data Stream _ The continuous flow of data from one place to another.

Data Synchronizer _ An electronic circuit that produces a clock signal that is synchronous with the incoming data stream. The clock signal is then used to decode the data.

Data Transfer _ The movement of data within the computer system. Typically, data are said to be transferred within the computer, but they are "transmitted" over a communications network. A transfer is actually a copy function since the data are not automatically erased at the source.

Database _ A set of related files that is created and managed by a database manage-

ment system (DBMS). Today, DBMSs can manage any form of data including text, images, sound and video. Most of the information available on the Internet is stored in the form of Databases. Database and file structures are always determined by the software. As far as the hardware is concerned, it's all bits and bytes.

Datacasting _ Also known as "enhanced TV." Datacasting is the act of providing enhanced options offered with some digital programming to provide additional program material or non-program related resources. This allows viewers the ability to download data (video, audio, text, graphics, maps, transcripts or web links, services, etc.) to specially equipped computers, cache boxes, set-top boxes, or DTV receivers. DTV's broadband channel allows information to be downloaded about 600 times faster than a personal computer modem.

Daughterboard _ A printed circuit board that plugs into another printed circuit board to augment its capabilities. Although Intel's Pentium II SEC modules are sometimes called daughterboards, it more typically refers to a small board that attaches to a removable expansion board such as a display adapter or sound card.

dB _ *Decibel* - 1/10 of a Bel. The standard unit used to express gain or loss of power. It indicates the logarithmic ratio of output power divided by input power. A power loss of 3dB is an attenuation of half of the original value. The term "3dB down" is used to describe the "half power point". In audio work, 0dB is the threshold of hearing. 120dB level is the threshold of pain. The volume of common sounds in decibels are: Whisper: 15 - 25 dB ;Quite background: about 35 dB; Normal home or office background: 40 - 60 dB; Normal speaking voice: 65 - 70 dB; Orchestral climax: 105 dB; Live rock music: 120 dB+; Jet aircraft: 140 - 180 dB. A change of 3dB halves or doubles the apparent loudness. This method of scaling levels becomes important because human sensitivity to sight and sound are logarithmic, which accounts for our large dynamic range capability. Different kinds of decibels measure a variety of signal types. One type, dBv, compares an electrical signal such as amplifier output with a 1-volt standard. Another type, dBr, can be used to measure the output of a speaker system relative to a reference sound level that represents the lower threshold of human hearing.

dB/Octave _ A means of measuring the slope of a filter. The more dBs per octave, the sharper the filter slope.

DBD _ *Displaced Block Difference*.

dBFS _ The meters on DAT machines all read in dBFS, "decibels below full scale". Full scale is the highest signal which can be recorded. Positive going signals with a value of 32767 or negative with a value of -32768 at 16-bit are at the maximum. Levels below those are translated to decibels, with 0 dBFS being full scale. For example, -10 dBFS is a level 10 dB below full scale.

dBm _ Measure of power in communications. A ratio of decibel strength to 1 milliwatt. 0 dBm = 1 mW, with a logarithmic relationship as the values increase or decrease. In a 50-ohm system, 0 dBm = 0.223 volts.

DBO _ *Dead Black Out.*

DBS _ *Digital Broadcast Satellite* - An alternative to cable and analog satellite reception, DBS is television service that allow households to receive television programming directly from satellites on 18" inch to 3" diameter fixed position satellite dishes. Composite analog video from standard cable services are converted to component digital, then MPEG compressed for transmission. This allows several programs to be broadcast from a single satellite transponder thereby allowing up a large number of channels to be received with a dish pointed at one orbital position in the sky. Programming on the various services includes most major cable services, sports, Pay Per View (PPV) movies, audio services, and specialized "niche" programming aimed at smaller audiences. These are often referred to as Direct To Home (DTH) services but the term Direct Broadcast Satellite (DBS) is more commonly used. HDTV programming is now available on some DBS services.

dBw _ Decibels referenced to 1 watt.

DC _ **a)** Used as an abbreviation for DigiCam (digital camera) _ **b)** Direct current, the flow of electrons in one direction. Battery power as in 9v DC battery

DC Coupled _ A circuit that passes both AC and DC components of signal, and, therefore, is sensitive to DC offsets.

DC Offset _ An imbalance that can sometimes occur at an A/D converter, where DC (direct current) which is basically a constant

voltage, is introduced into the digitized signal. Apart from reducing headroom, DC content can introduce clicks and pops while the audio is being edited.

DC Restoration _ DC restoration is what you have to do to a video signal after it has been AC-coupled and has to be digitized. Since the video waveform has been AC-coupled, we no longer know absolutely where it is. DC restoration essentially adds a known DC level to an AC-coupled signal. In decoding video, the DC level used for DC restoration is usually such that when the sync tip is digitized, it will be generate the number 0.

DCC _ *Digital Compact Disc*

DCC _ *Dynamic Contrast Control*. A circuit on CCD cameras for obtaining detail in an overexposed scene.

DCC _ Stationary head digital recorder format developed by Philips. Uses a data compression system to reduce the amount of data that needs to be stored.

DCF _ Design Rule for Camera File System - an industry standard for saving digital images. This not only determines the file type, but also sets the rule for naming the folder and file structure. It allows the conversion of uncompressed TIFF files into compressed JPEG files. This JPEG file is of the Exif type and can contain camera information such as the date.

D-cinema _ (Aka E-cinema) refers to the digital production, distribution and projection of cinema material. High definition television and the continuing development of digital video projectors (DLP and ILA-CRT) allow high quality viewing on large screens. While Hollywood may be looking for yet better quality, the lack of all too - familiar defects such as scratches and film weave - even after many showings - already has its appeal. Besides quality issues, D-cinema introduces potential new methods for duplication and distribution, possibly by satellite, and flexibility in screening. There is interest in electronic cinematography, shooting "film" electronically at 1080 x 1920/24p. With much film effects work already handled digitally, the question is when, rather than if, D-cinema will become widespread.

DCO _ *Digitally Controlled Oscillator*.

DCS _ *Desktop Color Separation* - an image file format comprised of five sets of data for each color image (one Post Script file for each color (CMYK) and one PICT preview file with controller data).

DCT _ *Discrete Cosine Transform* _ **a) compression** – widely used as the first stage of compression of digital video pictures. DCT operates on blocks of the picture (usually 8 x 8 pixels) resolving them into frequencies, amplitudes and colors. In itself DCT may not reduce the amount of data but it prepares it for following processes that will. JPEG, MPEG and DV compression depend on DCT. _ **b) format -** Ampex CCIR 601 digital VTR format using DCT to compress the video before recording it to tape. Digital component signals as well as four sound Tracks are recorded on a 3/4" (19 mm) wide technical pure iron tape with a maximum recording time of 190 minutes. DCT is today applied in the form of DST data recorder.

DD2 _ Using D2 tape, data recorders have been developed offering (by computer standards) vast storage of data (which may be images). A choice of data transfer rates is available to suit computer interfaces. Like other computer storage media, images are not directly viewable, and editing is difficult.

DDE _ dynamic data exchange - a Microsoft standard method of data exchange between Windows-based applications.

DDL _ *Digital Delay Line*.

DDP _ *disc data protocol* (for CD mastering).

DDR _ *Digital Disk Recorder*. A digital video recording device based on high speed computer disk drives. Commonly used as a means to get video into and out from computers.

DDS _ *Digital data service*.

DDSP _ *Digital display sync processing* — A signal handling method that allows the sync signal to pass through without altering sync pulse timing or width.

Deadly Embrace _ A stalemate that occurs when two elements in a process are each waiting for the other to respond. For example, in a network, if one user is working on file A and needs file B to continue, but another user is working on file B and needs file A to continue, each one waits for the other. Both are temporarily locked out. The software must be able to deal with this.

Deathmatch _ The multiplayer mode in the original Doom for the PC was called "deathmatch" by the game's creators, and the term has since become the gaming industry's label for the multiplayer game in all first-person shooters

Debug _ To correct a problem in hardware or software. Debugging software is finding the errors in the program logic. Debugging hardware is finding the errors in circuit design.

Debugger _ Software that helps a programmer debug a program by stopping at certain breakpoints and displaying various programming elements. The programmer can step through source code statements one at a time while the corresponding machine instructions are being executed.

DECAY _ one of the four basic stages of an envelope. Refers to the time the sound takes to settle into its sustain level.

Decimation _ When a video signal is digitized so that 100 samples are produced, but only every other one is stored or used, the signal is decimated by a factor of 2:1. The image is now 1/4 of its original size, since 3/4 of the data is missing. If only one out of five samples were used, then the image would be decimated by a factor of 5:1, and the image would be 1/25 its original size. Decimation, then, is a quick-and-easy method for image scaling. Decimation can be performed in several ways. One way is the method where data is literally thrown away. Even though this technique is easy to implement and cheap, it introduces aliasing artifacts. Another method is to use a decimation filter, which reduces the aliasing artifacts, but is more costly to implement.

Decimation Filter _ A decimation filter is a lowpass filter designed to provide decimation without the aliasing artifacts associated with simply throwing data away.

Decode _ Virtually all video and audio files have been encoded with some compression method, like DivX or MP3 and when we want to "open" these files, we need to decode that compression. Decoding basically means opening a compressed file, whether its done by playing the file or by storing it in an uncompressed format to HDD.

Decoder _ **a)** A device used to separate the RGBS (red, green, blue and sync) signals from a composite video signal. Decoders are used in video displays and processing hardware where component signals are needed from a composite source. _ **b)** The device in a synchronizer or programmer that reads the encoded signal and turns it into some form of control.

Decoding _ This is the process whereby the information in a compressed digital audio file is read so that it can be played and heard. Software MP3 players like UltraPlayer and Winamp decode and play MP3 files.

Decompression _ The process by which the full data content of a compressed file is restored. To open up compressed file(s).

Decryption Decoder _ The technology that converts and transfers the digital-based content, whether delivered by physical, satellite or broadband distribution, onto a digital projection system.

DECT _ **a)** *Digitally Enhanced Cordless Telecommunications* are a relatively new concept in telephone communications. They offer the user high quality cordless transmission and reception on digital networks. _ **b)** Acronym for *Digital European Cordless Telecommunications.* Another cordless phone standard currently under development

Dedicated _ **a)** *hardware* Hardware and software built for a specific task (e.g. a DV_ E), not general purpose (computer). Dedicated hardware gives much improved processing speeds, between 10 and 100 fold, over systems using the same technology applied to general purpose architecture and operating system software. This becomes important in image processing where tasks require a great deal of power, especially as the demands increase in proportion to the picture size - significant for working with HDTV. _ **b)** *Server or Program* A computer or program that is used only for one individual task. I.e. graphic design or as a Web server, etc. _ **c)** *Landing Zone* - The designated radial zone of the disk, usually at the inner portion of the disk, where the heads are stored to avoid contact with the data cylinders when power to the drive is off. _ **d)** *Line* A telephone line that is used solely for computer connections, and usually nothing else.

Default _ The current setting or action taken by hardware or software if the user has not specified otherwise. Application programs have dozens, if not hundreds, of defaults that determine everything from the font size that should be used to the folder a file is saved in.

Defaults also imply that the setting or action can be changed. The term is also used as a verb. For example, in the expression "the program defaults to xxx" means that the program does xxx under these circumstances unless directed to do otherwise.

Defect Management _ A general methodology of eliminating data errors on a recording surface by mapping out known defects on the media. The defective areas are rendered inaccessible, so that when information is written to the disk, it is stored to non-defective locations on the disk.

Definition _ The fidelity with which a video picture is reproduced. The clearer the picture, the higher the definition. Definition is influenced by resolution.

Deflection Yoke _ The electromagnets inside a television tube that guide the electrons to each individual phosphor dot on the surface of the screen. A flying electron changes its course in the presence of magnetic energy. Early inventors of the television set figured out a way to change the magnetic energy inside the tube with such accuracy that the electrons could each be aimed at one of a TV's hundreds of thousands of tiny phosphor dots.

Defloat _ To duplicate a floating section in its exact position without deselecting it.

Defragment _ The process of rearranging the files on a hard disk so that all the files are as contiguous as possible, and that the remaining free space is also contiguous.

Defringe _ Blends the pixels along the edge of a selection to seamlessly merge it with a new background.

Degausser _ A device that produces a strong alternating electromagnetic field which quickly erases an entire reel, cassette or tape cartridge. Also used for eliminating ghosting in television monitors by demagnetizing the CRT.

Degrees of Freedom _ The amount of movement available in a robotics or virtual reality system.

Deinterlace _ To remove artifacts that result from the nature of two-fields-per-frame (interlaced) video.

Delay _ The amount of time necessary for an analog or digital signal to pass through a device or circuit conductor or wire. A complex facility or a simple editing facility may share the same types of problems trying to overcome the effects of unwanted delay, especially where precise timing (phasing) is required not only between audio tracks but in relation to multiple video channels, such as mixing and recording AC-3 audio for DVD. It is important to know that there is always a delay when passing any signal, and that the delay will increase depending upon the amount of processing of the signal that may be involved, however the delay (or cumulative delay through multiple devices, circuits, and cables) may not be relevant to your application if it is minimal, and if in reference to video and audio and time code, the delays are all the same. A circuit or wire delay is also called a "Propagation Delay". Digital devices tend to create more delay than analog devices. New generation digital video synchronizers with auto-tracking audio and time code delays are used to correct for minor video to audio delays in standard definition video. If the video delay is severe, a new generation video time/memory cache may be employed. The concept of adding a delay can also be beneficial to live event or delayed broadcast coverage (helping to insure that station breaks are properly inserted, adding profanity delay, etc.) and may involve a multiple channel video server whereby an input channel is used to live record, and an output channel with access to the same disk storage for recall outputs the delayed feed (sometimes after editing). In the past, profanity broadcast delay was made possible by placing two tape machines near each other, recording on one, and stretch feeding the tape across the room to the playback machine.

Delta Frame _ In *interframe* (a.k.a. *temporal*) *compression*, periodic *keyframes* store all the information that comprises a frame, while delta frames store only the information that changes from frame-to-frame in between keyframes.

Demodulation _ The process of recovering an original signal from a modulated carrier. _ **a)** In NTSC and PAL video, demodulation is the technique used to recover the color difference signals. _ **b)** Also used after DTV tuners to convert the transmitted DTV signal to a baseband MPEG-2 stream.

Demultiplexing _ Separating elementary streams or individual channels of data from a single multi-channel stream. For example, video and audio streams must be demultiplexed before they are decoded. This is true for multiplexed digital television transmissions.

Density _ The degree of opacity of an image.

Density Range _ The difference between the density of the lightest and darkest parts of an image.

Depth Cueing _ a) Lowering of the intensity as objects move away from the viewpoint. **_ b)** A rendering technique that assigns color based on distance from the viewpoint.

Derived Image _ An image that has been created from another image through some kind of automated process, usually involving a loss of information. Techniques used to create derived images include sampling to a lower resolution, using lossy compression techniques, or altering an image using image processing techniques.

Deserializer _ A device that converts serial digital information to parallel digital.

De-skewing _ Straightening an image that has been scanned crookedly, or straightening type that is slanted.

Desktop _ a) A personal computer sized to fit on or under a desktop. **_ b)** The popular name for the Windows screen that you see when your computer has settled after starting up.

Desktop Publishing _ Describes the digital process of combining text with visuals and graphics to create brochures, newsletters, logos, electronic slides and other published work with a computer.

Desktop Video _ The process of planning, shooting, editing, and sharing videos using standard desktop computing platforms running add-on video hardware and software.

Despeckle _ To remove or reduce speckles or dust spots introduced during scanning or image processing.

Destructive Memory _ Memory that loses its content when it is read, requiring that the circuitry regenerate the bits after the read operation.

Detent _ Physical click stop in the centre of a control such as a pan or EQ cut/boost knob.

DETI _ Digispeak for "don't even think it!"

Developer's Toolkit _ A set of software routines and utilities used to help programmers write an application. For graphical interfaces, it provides the tools and libraries for creating menus, dialog boxes, fonts and icons. It provides the means to link the application to libraries of software routines and to link it with the operating environment (OS, DBMS, protocol, etc.).

Device _ a) Any electronic or electromechanical machine or component from a transistor to a disk drive. The term "device" always refers to hardware, never to software. **_ b)** In semiconductor design, it is an active component, such as a transistor or diode, in contrast to a passive component, such as a resistor or capacitor.

Device Bay _ A quick-change peripheral format from Compaq, Intel and Microsoft that enables hard drives, CD-ROM drives and other devices to be easily hot swapped without opening the case. Using the USB and IEEE 1394 FireWire interfaces, it provides three form factors (DB13, DB20 and DB32), which are 13, 20 and 32mm in height.

Device Context _ A data structure in Windows programming that is used to define the attributes of text and images that are output to the screen or printer. The device context (DC) is maintained by GDI. A DC, which is a handle to the structure, is obtained before output is written and released after the elements have been written.

Device Control Software _ A software module that controls a video deck to allow the capture of source clips to the hard drive of a computer.

Device Driver _ A software program that enables a PC to communicate with peripheral devices such as fixed hard drives and CD-ROM drives. Each kind of device requires a different driver. Device driver programs are stored on a Pac's fixed disk and are loaded into memory at boot time.

Device Enumeration _ Identifying all the devices attached to a system and initializing the required routines (drivers) that enable them to function.

Device Independent _ Refers to programs that work with a variety of peripheral devices. The hardware-specific instructions are in some other program (OS, DBMS, etc.).

Device Interface _ A conversion device that separates the RGB and sync signals to display computer graphics on a video monitor.

DHTML _ *Dynamic Hypertext Markup Language* - It's an extension to HTML which allows Web page designers and programmers to have more control over the appearance and position of items embedded into, or placed upon, Web pages.

DI _ a) *Direct Inject*, where a signal is plugged directly into an audio chain without the aid of a microphone. _ **b)** Acronym for *Digital Imaging*

DI Box _ Device for matching the signal level impedance of a source to a tape machine or mixer input.

Diagnostics _ Tests to check the correct operation of hardware and software. As digital systems continue to become more complex, built-in automated testing becomes an essential part of the equipment. Some extra hardware and software has to be added to make the tests operate. Digital systems with such provisions can often be quickly assessed by a trained service engineer, so speeding repair.

Dialogue Box _ This is the box that often appears in Windows to display warnings or messages telling you about what's going on. Usually there's a cancel button and an OK button as standard, plus other options if relevant.

DiBEG _ *Digital Broadcasting Experts Group* - founded September 1997 to drive the growth of digital broadcasting and international contribution by promoting the exchange of technical information and international cooperation.

DIC _ An acronym for *Device Independent Color*.

Dichroic _ A type of mirror, reflector or filter that selectively reflects different wavelengths of light, permitting a projector to transmit more visible light with less heating of the film. Dichroic mirrors are also used for internal convergence of 3-tube, single lens video or computer projectors.

Die _ is the formal term for an area of silicon containing an integrated circuit. A die has many layers, each designed for a specific function. The popular term for a die is chip.

Die Size _ The most dominant cost of a chip. As die size increases, the number of chips per wafer decreases and yields decrease rapidly. Usually measured in square mils or millimeters

DIF _ *Data Interchange Format* - a standard for access between programs.

Differential Gain _ Differential gain is how much the color saturation changes when the luma level changes (it isn't supposed to). For a video system, the better the differential gain - that is, the smaller the number specified - the better the system is at figuring out the correct color.

Diffusion Dithering _ A method of dithering that randomly distributes pixels instead of using a set pattern.

Digerati _ *digispeak* term for the "digital elite." People who are extremely knowledgeable about computers. It often refers to the movers and shakers in the industry. Digerati is the high-tech equivalent of "literati," which refers to scholars and highly educated individuals.

Digispeak _ In online communications, the use of acronyms to make a shorthand out of common phrases. For example, BTW for "by the way" and IMHO for "in my humble opinion." People are doing so much typing these days that they welcome shortcuts, and the shortcuts are turning into a new language.

Digit _ A single character in a numbering system. In decimal, digits are 0 through 9. In binary, digits are 0 and 1.

Digita _ is an OS specifically developed for use with digital still cameras. It enables the customization of a digital still camera's user interface and the processing of photo image data within its original scripting language. New functions can be added to an existing digital still camera by updating the OS to its latest version.

Digital _ In simple terms, one could say that digital processes only know two states: 1 or 0, yes or no. There is no simple way to represent all the values in between, such as 0.25. Continuous phenomena like curves are subdivided into sections and disaggregated into single events. Digital technology processes and transmits data as information packages. In contrast to analog systems, digital data can be identically presented and stored (light, electricity, characters, magnetic particles) in different media (data carriers). Digital representations are approximations of analog events. They are useful because they are relatively easy to store and manipulate electronically. The accuracy of presentation (resolution) is independent of the medium. A large quantity of data is necessary for high-quality signal processing. Since digital technology uses mere numerical values, the large amount of data can be reduced with the help of suitable mathematical (compression) methods.

Digital Appliance _ Any apparatus controlled by a computer. It may refer to an actual household appliance (coffee maker, toaster, etc.) that is computerized, but often refers to a handheld device such as a pager, cellphone or PDA.

Digital Art _ art stored on a computer in digital (that is, binary) form. The term is usually reserved for art that has been non-trivially modified by the computer; text data and raw audio and video recordings are not usually considered digital art, since the computer is merely the storage medium. Digital art can be purely computer-generated, such as fractals, or taken from another source, such as a scanned photograph or an image drawn using vector graphics software, using either a mouse or graphics tablet. The availability and popularity of photograph manipulation software has spawned a vast and creative library of highly modified images, many bearing little or no hint of the original image. Using electronic versions of brushes, filters and enlargers, these "Neographers" produce images unattainable through conventional photographic tools. In addition, digital artists may manipulate scanned drawings, paintings, collages or lithographs, as well as using any of the above-mentioned techniques in combination. 3D graphics are created via the process of designing complex imagery from geometric shapes, polygons or nurbs to create realistic 3 dimensional shapes, objects and scenes for use in various media such as film, television, print and special visual effects. The mainstream media uses a lot of digital art in advertisements, and computers are used extensively in film to produce special effects. Desktop publishing has had a huge impact on the publishing world, although that is more related to graphic design. Nonetheless, digital art is yet to gain the acceptance and regard reserved for "serious" art forms such as sculpture, painting and drawing, perhaps due to the erroneous impression of many that "the computer does it". However, digital artists have a wide range of above-mentioned techniques - arguably more extensive than those of other modes of art - at their disposal with which to creatively express themselves. Computers are also commonly used to make music, especially electronic music, since they present an easy and powerful way to arrange and create sound samples. It is possible that general acceptance of the value of digital art

will progress in much the same way as the increased acceptance of electronically produced music over the last three decades.

Digital Asset _ Any material created on the computer by employees of the organization or that has been custom developed for and purchased by the organization. Images scanned into the computer are also a digital asset if the original work is owned by the company.

Digital Audio _ Refers to a way of synthesizing sound. In a digital format sound waves are broken down and assigned a numerical value, represented by groups of 1s and 0s. When these groups of numbers are read by a receiver or amplifier, they are converted back into sound. This kind of mathematical precision creates crisp, clean sounds. Common digital audio formats are music CDs, WAV, AIFF and MP3. Music CDs, which use the Red Book digital audio format, are played in CD players as well as CD-ROM readers. WAV, AIFF and MP3 files are played by a media player software application. The files can be stored on a hard disk or written onto a CD-ROM as well. Although also in digital form, MIDI music is not considered digital audio. MIDI files contain a coded version of the musical score, not the actual sound.

Digital Audio Broadcasting (DAB) _ Also know as digital radio, Digital Audio Broadcasting is a digital method of transmitting audio and other information over the airways to radio receivers.

Digital Audio Extraction _ A method of retrieving audio samples from an audio CD in order to create a computer audio file. Also known as Ripping.

Digital Auto Tracking _ Automatically adjusts tracking on a VCR to optimize playback of previously recorded tapes.

Digital Betacam _ A development of the original analogue Betacam VTR which records 4:2:2 component video digitally with 10 bits resolution on a Betacam-style cassette. It uses mild intra-field (DCT based). compression to reduce the ITU-R BT.601 sampled video data by about 2:1. Some models can replay both digital and analogue Betacam cassettes.

Digital Betacam SX _ Digital component videotape in highly compressed MPEG form (10:1) on 1/2" tape.

Digital Cable _ Cable television in digital form. A replacement for the land-based analog cable, digital cable provides on screen program guides, a sharper picture and more channels of paid and on-demand programs. Contrary to many consumers" beliefs, digital cable is not the same as High-definition Television or Digital Television; rather digital cable simply offers cable subscribers the options of paying for more services. Unlike "digital satellite TV," which requires a dish on the roof, digital cable, also known as "digital terrestrial TV (DTTV)," is still delivered over coax cable to the building.

Digital Camera _ A device that captures an image on a CCD (charged coupled device) so that the image file can be downloaded to and manipulated by a computer; does not use conventional film.

Digital Chromakeying _ Digital chromakeying differs from its analog equivalent in that it can key uniquely from any one of the 16 million colors represented in the component digital domain. It is then possible to key from relatively subdued colors, rather than relying on highly saturated colors that can cause color spill problems on the foreground. A high-quality digital chromakeyer examines each of the three components of the picture and generates a linear key for each. These are then combined into a composite linear key for the final keying operation. The use of three keys allows much greater subtlety of selection than does a chrominance-only key.

Digital Cinema _ Refers to any aspect of movie making in the digital domain including capture, editing, distribution and presentation, also known as "d-cinema" and "e-cinema." Computer graphics has greatly enhanced movie making for years, but it will allow for even more spectacular effects in the decades ahead. Although digital dinosaurs and other animals look rather realistic, we are still some years away from the man or woman that is nothing more than a digital script (that is, a totally believable human face). In time, it is expected that movie distribution will be all digital, and movies will be beamed to theaters by satellite in real-time.

Digital Cinema Sound System _ developments that represent re-thinking of home theater sound, based on careful measurements of movie production dubbing stages in Hollywood.

Digital Coax Output _ Transmits a digital audio signal via a digital coaxial cable. Similar in quality to a digital optical output, it is found on most mid-level and high-end DVD players and some CD players.

Digital Comb Filter _ Filter that digitally separates color and black and white signals in your TV, providing a sharper picture and reducing artifacting and shimmer. The best digital comb filters, called 3-line digital comb filters, compare three lines of video to ensure the best possible picture.

Digital Component Video _ Digital video using three separate color components, such as Y'CbCr or R'G'B'.

Digital Composite Video _ Digital video that is essentially the digitized waveform of NTSC or PAL video signals, with specific digital values assigned to the sync, blank, and white levels.

Digital Control _ **a)** A method using discrete digital impulses to control individual functions within a system. _ **b)** A digital control is one that can only sense a single degree of input, such as whether it is being pressed or not. Therefore, for instance, pressing a digital directional pad in one direction will only tell a game that the character is being directed to walk, not the speed at which he should walk.

Digital Convergence _ In the days of the first computers, transaction and company data were the first types of information digitized. Then came text, opening the world to word processing, followed by audio CDs and finally video. Having all forms of information in the digital domain has given rise to numerous convergence opportunities. Interactive TV, long on promise, may still come to fruition some day as cable TV, video on demand and the Internet converge on screen. The Internet not only delivers tons of data and text, it has become a transport for radio, music and images. In 2002, Microsoft introduced the Windows XP Media Center, which is a version of Windows that controls home entertainment devices. Although there have been some attempts that have dwindled to nothing for the most part, many still believe that the melding of entertainment and computer technology is expected to take off this decade. Data and voice have converged. Billions have been spent by private enterprises and telecom carriers to develop VoIP networks using the Internet's IP protocol so that voice travels over the same packet network as data. The DVD disc is another convergence example. As rewritable DVDs become popular, they could replace VHS videotapes, providing a standard format for home theater and general computer storage.

Digital Disk Recorder _ Disk systems that record digital video. They are typically based on parallel transfer disk drives And offer a short duration (of uncompressed CCIR 601 video), around a minute or so, of recording time. Their application is often as a replacement for a VTR or as video caches to provide extra digital video sources for far less cost than a DTVR. Although they also have the advantage of not requiring pre-rolls or spooling, their operation is not necessarily true random access.

Digital Domain _ The world of digital. When something is done in the digital domain, it implies that the original data (images, sounds, video, etc.) has been converted into a digital format and is manipulated inside the computer's memory.

Digital Effects _ Special sounds and animations that have been created in the digital domain. Synthetic sounds and reverberation, morphing and transitions between video frames (fades, wipes, dissolves, etc.) are examples.

Digital ESP _ Digital Electro-Selective Pattern. The employment of a selective multi zone metering system ensures an optimal exposure even in difficult lighting conditions.

Digital Film _ a) Term used to describe solid state flash memory cards used in digital still cameras. _ **b)** Also describing the process of film production that uses digital technology.

Digital I/O _ Input and output connections where signals passed from one stage to another remain in the digital domain. SDI and Fire-Wire are among the most popular.

Digital Image _ An electronic photograph taken with the camera or scanned from an original document, made up of a set of picture elements ("pixels"). Each pixel is assigned a tonal value (black, white, a shade of gray, or color) and is represented digitally in binary code (zeros and ones).

Digital Intermediate (DI) _ A Digital Intermediate is the result of the process of shooting Highdef, or shooting on film followed by scanning to film quality data files, editing the project in High Definition, and applying the creative process of color correction and color treatment to the completed master. This Digital Intermediate then becomes the master for video, DVD or for theatrical output by transferring this data master back to film. The big advantage over the conventional method is in the creative process. Once you have scanned your feature to a data master you have the same creative ability and freedom that is available when mastering a television movie or high end television commercial. Creative decisions on effects like speed ramps, freeze frames, dissolves, dips to color, wipes, multi layers and re-use of material are all very simple. Most "optical" effects are part of the automatic conforming process in online editing. Trailers can be cut from actual film footage because the original film now exists in an HD digital format.

Digital Library _ Definitions of the digital library range from narrow to broad, with some disagreement on the actual function of a digital library. Clifford Lynch (Director of the Coalition for Networked Information) defines the digital library as "an electronic information access system that offers the user a coherent view of an organized, selected, and managed body of information." This definition recognizes the more traditional role of a library in the digital world at the very least, a digital library should offer services along with information, such as indexing or cataloging. Users of digital library resources may come to expect (and already do expect) more sophisticated functions, such as information and knowledge management services, resource discovery mechanisms, and personalization of access and monitoring of new and existing digital resources.

Digital Light Processing (DLP) _ An all-digital display technology that turns image data into light capable of projecting sharp, clear images of almost any size without losing any of the original image's resolution. The technology inside is often referred to as either "micro-mirrors", or DMD. It works this way build a few hundred thousand tiny mirrors, and line them up in 800 rows of 600 mirrors each. Now attach a hinge to each of those 480,000 mirrors. Attach each of those 480,000 hinges to its own very tiny motor! Power each motor with electrostatic energy! The motors tilt their mirrors up to 20 degrees at incredible speeds. This allows the mirrors to modulate light from a lamp, and send the "modulated signal" out through a lens, on to a screen. The most amazing part of DLP micro mirrors, is the scale of size. The 480,000 mirrors (actually 580,000 are used), hinges and motors are packed onto a "wafer" a bit larger than your thumbnail.

Digital Mavica _ Sony's Digital Mavica is the world's first digital still camera using a 3.5" floppy - the most common medium in the PC world. In combination with the most popular JPEG picture compression format, Mavica has become a breakthrough digital still camera concept. The newest version of the camera writes data on the CD-R/RW media.

Digital Mixing _ Digital mixing requires "scaling" each of two digital signals and then mixing them. When two 8 bit numbers are multiplied together, the results is 16 bit number. When mixing, it is important to add the two 16 bit numbers to obtain an accurate result. This result then must be truncated or rounded to 8 bits for transmission to other parts of the digital system.

Digital Monitor _ DTV monitors are televisions that can display a digital signal but lack an integrated tuner (unlike an integrated digital set), and thus cannot receive a digital broadcast signal without an additional set-top box.

Digital Nervous System _ Microsoft's term for a network and set of enterprise applications that support multimedia for every user. It implies complete integration between intranets and the Internet via landline and wireless communications. In other words, the fully integrated, super-advanced, electronic office of the future.

Digital Noise Reduction _ Sophisticated procedures for removing of the digital noise in video and audio signals.

Digital Optical Output _ Transmits a digital audio signal via a fiber optic cable. It is practically immune to magnetic or electrical interference. Similar in quality to a digital coax output, it is found on most mid-level and high-end DVD players and some CD players.

Digital Parallel Distribution Amplifier _ A distribution amplifier designed to amplify and fan-out parallel digital signals.

Digital Picture Effects _ Advanced effects for enhancing videos, such as mixing in still videos or adding stroboscopic or "old movie" effects.

Digital Picture Frame _ An Internet appliance that displays a picture on an LCD screen and uses an always-on cable modem or DSL connection. It lets you upload images over the Internet directly into the digital frames of family members and friends. These "smart" picture frames hold several images and, like a slide projector, can be made to change pictures at prescribed intervals. For a service fee, art of all kinds can also be downloaded into digital picture frames.

Digital Platters _ Sequences of digitized trailers, features and other content that can be created in the Digital cinema environment.

Digital Print _ A page output from a digital data directly to a printer attached to a computer.

Digital Projector _ A device that connects to a computer via cabling to enable the computer monitor display to be enlarged and projected onto a screen.

Digital Reality Creation (DRC) _ MultiFunction circuitry. Sony's innovation in television technology, uses digital mapping to convert a conventional TV image into its high definition equivalent. The system creates four times as much data for a more solid, more convincing picture. This system enables you to choose between interlaced and progressive display modes.

Digital Recorders _ Video recorders that record digital signals on magnetic tapes.

Digital Remaster _ A conversion of music from its original analog master recordings to digital format. In the early days of audio CDs (mid-1980s), many music albums were converted from tapes that were equalized for the smaller dynamic audio range of the LP vinyl record and phonograph player. Some of these songs were later digitally remastered using the original tapes before equalization was applied.

Digital Scripts _ These are coding commands that turn complex digital imaging tasks into menu options that can be executed with a few steps. Scripts can be written for capture, post-processing, and application-related tasks.

Digital Signal _ A signal representing video or audio information as binary digits that can be easily regenerated with no noise or distortion.

Digital Signal Processor (DSP) _ is at the heart of products like high-density hard-disk drives, desktop videoconferencing and audio/video compression by rapidly processing large amounts of digital information. This technology, when used in conjunction with mixed-signal devices and embedded software, is referred to as a DSP Solution, and it collects, processes, compresses, transmits and displays analog and digital data.

Digital Signature _ Often used by businesses as a quick way of signing large numbers of E-mails. The signature of the sender is saved as a file on the computer and when appropriate, is automatically imported into the bottom of the E-mail message.

Digital Synthesis _ The use of numbers to create sounds. Method most often used in today's synthesizers for generating sounds, as compared to analog method employed previously.

Digital Television (DTV) _ The latest TV broadcast technology. To send a digital stream of information to the television set, a TV station takes tiny slices of the video image, assigns a numeric value to describe each slice, and mathematically encodes those values into equations. *Digital TV* is the umbrella term encompassing High-definition Television and several other applications, including Standard-definition Television, datacasting, multicasting and interactivity. Refers to transmitting a broadcast signal by encoding it as 0s and 1s - the digital binary code used in computers. DTV can provide high quality programming (HDTV) or provide four, five or more channels in the same bandwidth required for one channel of the current standard television.

Digital Television Set _ A TV set built to receive digital broadcasts. Also refers to the digital broadcasts themselves, which are currently transmitted by more than 10 percent of U.S. television stations. The digital signals are either high-definition - HDTV - or standard-definition - SDTV.

Digital to Analogue Converter _ Set top box that receives a digital signal and reformats it so that it can be displayed on an analogue television.

Digital Transmission _ Future TV transmission will bring digital pictures and sound all the way into our homes. Using digital compression several TV channels can be transmitted in the bandwidth of a single analogue channel, so allowing more to be received - and with greater clarity of picture and sound.

Digital Transmission Content Protection An encryption method (also known as "5C") developed by Sony, Hitachi, Intel, Matsushita and Toshiba for **IEEE 1394** interfaces.

Digital Tuner _ A digital tuner serves as the decoder required to receive and display digital broadcasts. It can be included inside TV sets or via a set-top box.

Digital VCR _ Digital VCRs are similar to analog VCRs in that tape is still used for storage. Instead of recording an analog audio/video signal, digital VCRs record digital signals, usually using compressed audio/video.

Digital Video _ a) Video recording in digital form. In order to edit video in the computer or to embed video clips into multimedia documents, a video source must originate from a digital camera or be converted to digital. Frames from analog video cameras and VCRs are converted into digital frames (bitmaps) using frame grabbers or similar devices attached to a personal computer. Uncompressed digital video signals require huge amounts of storage, and high-ratio real-time compression schemes, such as DV or MPEG, are essential for handling digital video in today's computers. _ **b)** *DV format* Picture and sound are converted to and recorded as digital signals (DV compression). The chrominance signal (C) is further split into component signals (Red-Y, Blue-Y). The DV terminal i.LINK enables no-loss data transfer to postproduction equipment for 1 to 1 editing quality.

Digital Video Effects (DVE) _ A frame buffer capable of real-time zooming, repositioning, and freeze-frame. Some are also capable of warping video frames into trapezoids, cylinders, and spheres, to create a variety of special effects.

Digital Video Recorder _ DVRs can be thought of a digital version of the VCR, with several enhancements. Instead of a tape, the DVR uses an internal hard disk to store compressed audio/video, and has the ability to record and playback at the same time. The main advantage that DVRs have over VCRs is their ability to time shift viewing the program as it is being recorded. This is accomplished by continuing to record the incoming live program, while retrieving the earlier part of the program that was just recorded. The DVR also offers pause, rewind, slow motion, and fast forward control, just as with a VCR.

Digital Watermark _ A pattern of bits embedded into a file used to identify the source of illegal copies. For example, if a digital watermark is placed into a master copy of an audio CD or a DVD movie, then all copies of that disc are uniquely identified. If a licensee were to manufacture and distribute them in areas outside of its authorized territory, the watermark provides a trace.

Digital Word _ The number of bits treated as a single entity by the system.

Digital Workstation _ The computer-based system used for editing and manipulating digital audio, and synchronizing digital audio with video for video post-production applications.

Digital Zoom _ Allows the user to zoom in on a subject beyond the range provided by the optical zoom lens. Digital zooming crops the center of the digital picture and resizes the new cropped picture to the size of the selected resolution. This means that the existing data is not enhanced or added to, merely displayed at a lower resolution, thereby giving an illusion of an enlarged image.

Digital8 _ A digital video recording and playback format that uses the same cartridges as 8mm and Hi8 analog systems, but uses twice as much tape. Digital8 horizontal resolution is 500 lines, which is similar to the DV/MiniDV format (8mm is 270 lines of resolution; Hi8 is 400 lines). Digital8 uses the same video compression standards as DV, but records them in a different physical format. Introduced by Sony, Digital8 camcorders and players compete directly with MiniDV units, but have the advantage of playing 8mm and Hi8 analog tapes.

Digitally Signed _ Any message or key that has been encrypted with a digital signature. When a user's public key is digitally signed by a certification authority (CA), it is known as a *digital certificate* or *digital ID*.

Digital-ready _ A difficult term to translate on its own. May describe a TV set that has special features for digital television. It may also refer to a television that can show high- definition broadcasts in true high-definition resolution. Or, any device that is "ready" for receiving any kind of digital data.

Digital-S _ (also known as D-9) A standard definition digital 3:1, 8-bit compressed 4:2:2 sampled 50Mb/sec (picture payload) component digital tape format that uses non-proprietary DCT compression on a proprietary (but licensed) tape format developed by JVC.

Digitize _ To convert an image or signal into digital code by scanning, tracing on a graphics tablet or using an analog to digital conversion device. 3-D objects can be digitized by a device with a mechanical arm that is moved onto all the corners.

Digitizer _ A piece of equipment or a system that can convert signals or objects into digital files that the computer can read and respond to. Examples include digital cameras, analogue to digital converters (ADCs), touch tablets and mice. Some of these, mouse and touch tablet for example, are systems which take a spatial measurement and/or pressure and present it to a computer in a digital format. You can also digitize 3D objects. For that you use a 3D digitizer. These come in many different shapes and sizes. They usually use lasers to map out the 3D points and create a mesh. Some other ones may use a pen as a probe which is attached to some sort of armature which can calculate points you touch on real objects into a computer model.

Digitizing Tablet _ A mouse replacement comprised of a "pen" and flat panel wired to the computer. Pen movements on the tablet are reproduced on the computer screen and pressing the tip of the pen against the tablet mimics pressing the mouse button. Some tablets may be pressure-sensitive in illustration programs like Photoshop - a harder pressure makes a thicker line.

Digitizing Time _ Time taken to record footage into a disk-based editing system. The name suggests the material is being played from an analogue source which, with the rapidly increasing use of DVTRs, is not always the case. A better term is "loading". Use of high-speed networking such as Clipnet may enable background loading - eliminating digitizing time at an edit suite. Digitizing time is often regarded as dead time but it need not be. It can be reduced if some initial selection of footage has been made - for example by logging.

D-ILA _ *Direct drive image light amplifier* Developed by Hughes-JVC, D-ILA uses a digitally addressed ILA (Image Light Amplifier) instead of a CRT-addressed one as with earlier devices. The new D-ILA technology is a reflective liquid crystal modulator where electronic signals are addressed directly to the device. The D-ILA device has an X-Y matrix of pixels configured on a CMOS single crystal silicon substrate mounted behind the liquid crystal layer using a planar process that is standard in IC technology. The pixel electrodes of the device have a 93% aperture ratio.

DIMM _ *Dual Inline Memory Module* - an industry standard for Pentium memory chips. These are tiny circuit boards with ram chips on them that slot into the motherboard (almost always at right-angles) i.e. 90º.

DIN connector _ An acronym for ***Deutsche Industrie Norm*** - A round connector with notches, or keys for alignment. They can be in several sizes: 4-pins, 5-pins, 8-pins, etcetera. A convenient way of combining all of the signal lines in one connector, 4-pin DIN connectors are often used for S-video.

Dingbats _ A font comprised of symbols (arrows, pointing hands, stars, etc.) that were originally developed by International Typeface Corporation. They are officially called ITC Zapf Dingbats. There are many variations of Dingbats from other font houses. For example, TrueType brings Wingdings and Webdings, offering a wide variety of symbols for numerous purposes.

Diode _ a) An electronic device that allows current to flow in one direction only. **_ b)** Light-sensitive electronic component used by the scanner during image capture. Diode sense the presence or absence of light and create a digital signal that the computer then converts into pixel values.

DIP _ *Dual in-line package* - A universal method of manufacturing integrated circuits (ICs) with the pins arranged in two parallel rows. Some DIP components are soldered in, and some use DIP sockets.

DIP switches _ Small switches that are used to change settings on printers, computers, interfaces, switchers and modems. They are designed to fit in a DIP space on a circuit board.

Dipole _ a) A type of antenna with two defined opposing radiating elements, both of the proper length for the frequency of operation, and each forming a counterpoise for the other. **_ b)** An open-back speaker that radiates sound equally front and rear. The front and rear waves are out of phase and cancellation will occur when the wavelengths are long enough to wrap around. The answer is a large, wide baffle or to enclose the driver creating a monopole.

Dir _ *Digital Instrumentation Recorder* - A high-performance magnetic tape technology from Sony that uses 19mm tape and a helical scan transport. Based on the ANSI ID-1 recording format (D1 component digital video),

models can provide up to 64 Mbytes/sec data transfer, which is extremely fast and necessary for sonar, radar and other intelligence gathering applications. DIR drives and libraries have become a de facto standard in the U.S. government. Tape cassettes come in 8.7GB, 43GB and 96GB capacities.

Direct Access _ The ability to go directly to a specific storage location without having to go through what's in front of it. Memories (RAMs, ROMs, PROMs, etc.) and disks are the major direct access devices.

Direct View TV _ TV capable of displaying a digital signal or a signal for standard TVs.

Direct X _ A Microsoft-developed program that allow your computer to access hardware such as your graphics card at the highest possible speed, without being written specifically for each hardware model. It is essential to have an up to date version of Direct X on your computer if you want to play fast action games.

Direct3D _ Microsoft's standardized 3D programming interface.

DirectDraw _ A 2-D graphics programming interface (API) from Microsoft for Windows.

Directory _ A catalog of computer contents/files.

DirectPlay _ A Microsoft API (part of DirectX) which allows developers to create multiplayer features in games to a common standard.

DirectShow _ is part of DirectX. The application programming interface (API) for client-side playback, transformation, and capture of a wide variety of data formats. DirectShow is the successor to Microsoft Video for Windows and Microsoft ActiveMovie, significantly improving on these older technologies.

Dirty Bit _ A bit in a memory cache or virtual memory page that has been modified by the CPU, but not yet written back to storage.

Dirty List _ *(dirty EDL)* - An edit decision list (EDL) containing overlapping or redundant edits.

Disc _ Term used to describe optical storage media (video disc, laser disc, compact disc), as opposed to magnetic storage systems which are named "disks".

Disc Array _ Multiple hard disks formatted to work together as if they were part of a single hard drive. Disc arrays are typically used for high data rate video storage.

Disc Image _ A single large file which is an exact representation of the whole set of data and programs as it will appear on a CD, in terms of both content and logical format.

Disc Navigation _ Provides access to recorded scenes in a DVD Camcorder. Also features a wide variety of in-camera editing options.

Disc Recorder _ Disc recorders are recorders that store image and sound on a hard disk instead of a magnetic tape. Depending on the manufacturer, the digital image and sound data are recorded either in an uncompressed or compressed way. As with non-linear editing systems, the manufacturer of disc recorders make use of different compression methods. As a rule, disc recorders are used as stand alone devices, but there are also board only solutions by means of which a PC can be transformed into a disc recorder.

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

Discrete 5.1 Audio _ This reproduces six separate (discrete) channels - Left, Centre, Right, Left Rear, Right Rear and sub-woofer. All the five main channels have full frequency response which, together with a separate low-frequency subwoofer, create a three-dimensional effect.

Discrete Component _ An elementary electronic device constructed as a single unit. Before integrated circuits (chips), all transistors, resistors and diodes were discrete. They are widely used in amplifiers and other devices that use large amounts of current. They are also still used on circuit boards intermingled with the chips.

Discrete Logic _ An individual gate on a single chip. Although up to hundreds of thousands of gates are routinely placed on a single chip, discrete logic chips that contain only one or two gates are also manufactured. These chips are used as glue chips between ASICs and other ICs typically to reshape and transfer signals.

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

Discrete Time Oscillator (DTO) _ A discrete time oscillator is a digital version of the voltage-controlled oscillator.

Discretionary Compression _ Quantel term for switching between compression and no compression freely at any video frame boundary - typically used on an on-line non-linear edit suite. This allows compression to be used where the editing requires only cuts, and no compression where video processing is required (dissolves, wipes, DVEs, layering etc). This method offers the advantage of the storage economy of compression for most material while maintaining picture quality where otherwise decompression and recompression would have to be used, or the pictures may compress poorly, e.g. with graphics.

Disk _ a) Term used to describe magnetic storage media (floppy disk, diskette, hard disk), as opposed to optical storage systems. _ b) A rigid platter, usually constructed of aluminum or Mylar, with a magnetic surface that allows the recording of data to be stored inside the drive.

Disk Access _ Reading and writing the disk. It generally refers to the most time-consuming part of the operation, which is moving the read/write head. The disk access time is the average of the time it takes to position the head over the requested track.

Disk Array _ Two or more disk drives combined in a single unit for increased capacity, speed and/or fault tolerant operation.

Disk Cache _ Improves performance of disk controller via high-speed memory.

Disk Controller _ The chip or circuit that controls the transfer of data between the hard drive and buffer.

Disk Drive _ A device that reads data from and writes data onto a disk. A disk drive rotates the disk very fast and has one or more heads that read and write data. There are different types of disk drives for different types of disks. For example, a hard disk drive (HDD) reads and writes hard disks, and a floppy drive (FDD) accesses floppy disks. A magnetic disk drive reads magnetic disks, and an optical drive reads optical disks. Disk drives can be either internal (housed within the computer) or external (housed in a separate box that connects to the computer).

Disk Emulator _ A solid state replication of a disk drive.

Disk Grooming _ Deleting old and unnecessary files on a disk.

Disk Mirroring _ The recording of redundant data for fault tolerant operation. Data are written on two partitions of the same disk or on two separate disks within the same system. Disk mirroring uses the same controller. RAID 1 provides for mirroring, which is usually accomplished with SCSI drives and, increasingly, with IDE drives.

Disk Partition _ A subdivision of a hard disk. The maximum size of a disk partition depends on the operating system used.

Disk Striping _ The spreading of data over multiple disk drives to improve performance. Data are interleaved by bytes or by sectors across the drives. For example, with four drives and a disk striping controller that is designed for simultaneous reading and writing, four sectors could be read in the same time it normally takes to read one. Disk striping does not inherently provide fault tolerance or error checking. It is used in conjunction with various other methods.

Disk Transfer Rate _ Speed at which data transfers to and from the disk media (actual disk platter); a function of the recording frequency. Hard drives have an increasing range of disk transfer rates from the inner diameter to the outer diameter of the disk.

Display Adapter _ *DA -* A circuit board added to a computer to drive a monitor or other display device.

Display Card _ A card that has its own memory and processor to handle graphics and enhance display capabilities. Also called graphics accelerator card or graphics card.

Display Device _ Any output device for presenting information visually. Examples include the CRT (cathode ray tube), LED (light emitting diode), LCD panel (liquid crystal display) and gas plasma. A general term for a projector or monitor.

Distortion _ An undesirable effect that can occur in audio and video signals. In audio, distortion may manifest itself as discordant or harsh sound, or as static. In video, distortion may appear as waves, snow, or incorrect colors.

Distributed Server_ Distributed server networks comprise servers that are proliferated throughout a network to the widest possible extent, as distinct from a central-server based network where the servers are located in one or a limited number of locations on a network

Distribution Amplifier _ A device that allows connection of one input source to multiple, isolated (buffered) output devices such as loudspeakers, monitors or video projectors.

Distribution Quality _ The level of quality of a television signal from the station to its viewers. For digital television this is approximately 19.39 Mbps.

Dither _ A form of smart conversion from a higher bit depth to a lower bit depth, used in the conversion of audio and graphic files. In the conversion from 24-bit color to 8-bit color (millions of colors reduced to 256), the process attempts to improve on the quality of on-screen graphics with reduced color palettes by adding patterns of different colored pixels to simulate the original color. The technique is also known as "error diffusion," and is applied to audio bit rate reduction and graphic resolution.

Dither Pattern _ The matrix of color or gray-scale values used to represent colors gray shades in a display system with a limited color palette.

Dithering _ a) method of simulating many colors or shades of gray by combining only a few; for instance, red and blue dots are dithered to make purple. Dithering allows a photo with millions of colors to be displayed on a 256-color monitor and printed on a 4-color printer**. _ b)** In digital video terms, it is the process of adding quantizing or spatial noise to reduce contouring or other alias artifacts.

Divx _ a) DivX is MPEG-4 based video compression technology that can shrink digital video to sizes small enough to be transported over the Internet, while maintaining high visual quality. MPEG-4 is a new standard of video compression that is both high quality and low bitrate. They are usually only a fraction (around 15%) of the size of a standard DVD, even at 640x480 resolutions, making them the best home video format thus far. They only take half the time to encode, and yet at the same time is smaller in size than MPEG-1 - due to their incredible compression technology - some have even called MPEG-4 the "MP3 of the video world". Quality ranges from net-streaming quality to DVD and better. **_ b) DIgital Video EXpress** Originally, a DVD rental system that was rolled out in June of 1998 and taken off the market one year later due to lack of sales. A joint venture of

Circuit City and a Los Angeles entertainment law firm, Divx used special discs and a special DVD machine that played Divx movies and regular DVD movies. Consumers paid a rental charge for the Divx disc, which lasted for two days after the first viewing. Additional playing time or unlimited use could be purchased by credit card via the modem in the Divx player, or the disc was thrown away. One of the problems with the system was that the Divx disc was registered to the specific machine that sent in the registration and could not be played on other Divx players. All remaining Divx discs could not be upgraded to unlimited use, but could be viewed until June 30, 2001. _ **c)** A copy of the DVD copy protection decryption algorithm that was lifted from a media player and passed around hacker sites. The Divx name was used in honor of a "defunct" system.

dll _ *Dynamically Linked Library* - These are libraries of object files or executable code modules available to programmers writing code for the Windows operating system environment.

DLP _ *Digital Light Processing* - Digital Light Processing (DLP) is a technology that uses small micro mirrors to reflect the light in the correct direction. The technology was created by Texas Instruments. A DLP integrated circuit can have anywhere from 800 to 1 million mirrors on the surface. The mirrors when addressed can tilt from -10 to +10 degrees. DLP now displays resolutions up to 1280 x 1024. It is also know as DMD for digital micro-mirror device.

DLP Cinema _ *Digital Light Processing Cinema* - a version of DLP technology specifically developed for digital electronic movie presentation. It contains extended color management and control, and enhanced contrast performance. DLP Cinema is expected to play a key role in electronic cinema systems of the future.

DLT _ *Digital Linear Tape* - DLT tape drives are used for storing and archiving of digital image and sound data. They enable fast access and storage times but are more expensive than other tape drives. Commonly used for submitting a premastered DVD disc image to a replication service.

DMA _ **a)** *Direct Memory Access* - A process for transferring data directly to and from main memory, without passing through the CPU. DMA improves speed and efficiency by allowing the system to continue CPU processing even while it is transferring data to/from the hard drive. _ **b)** *Device Memory Allocation* - when considering the memory allocation to a device such as a CD-ROM or a CD-Writer.

D-MAX _ The highest level of density.

DMD _ *Digital Micromirror Device* - In 1977, it was originally called "Deformable Mirror Device". *Texas Instruments* has developed DMD microchips used in DLP (digital light processor) projector subsystems that hope to replace the 100-year old CRT technology. A silicon integrated circuit used to modulate light in a wide variety of applications. The most common use is in electronic projection systems where one or more devices are used to create high quality color images. The device is a memory circuit whose elements are arranged in a display format array. Each element contains a square aluminium mirror which can tilt about its diagonal axis. The content of the memory cell causes the mirror to move from one tilt position to the other. By changing the memory data, the mirror can be switched very rapidly to create pulses of light whose duration causes the pixel to appear at a particular brightness. DMDs are produced at different sizes according to the resolution required. The smallest contains over 500,000 mirrors.

D-Min _ The lowest level of density.

DMM _ *Digital multimeter*.

DMZ _ *Demilitarized Zone* - A middle ground between an organization's trusted internal network and an untrusted, external network such as the Internet. The DMZ is a subnetwork (subnet) that may sit between firewalls or off one leg of a firewall. ISPs typically place their Web, mail and authentication servers in the DMZ. DMZ is a military term that refers to the area between two enemies.

DNG _ *Digital news gathering* - Electronic news gathering (ENG) using digital equipment and/or transmission.

Docking Station _ A base station for a laptop that turns the portable computer into a desktop system. It uses a large plug and socket to quickly connect the laptop, which duplicates all the cable lines for the monitor, printer, keyboard, mouse, etc. The docking station typically has one or two slots for expansion boards and may house speakers and other peripherals such as a CD-ROM drive.

Dodging _ Also called holding back; in traditional darkroom work, the hand of the developer or a piece of cardboard would be used to block light passing from the enlarger to the print, thus lessening the exposure in only specific parts of the picture. *Digitally*, the effect is to lighten part of the image without affecting the rest.

Dolby _ Dolby is a method for reducing noise in analog magnetic tape recording. There are different methods (Dolby A, B, C, SR) aiming at different requirements of professional technology and consumer electronics. While they differ in the details of their operation and the degree of noise reduction they provide, all Dolby noise reduction systems answer the same question: how can noise be reduced without harming the music? Unlike simple noise filters, Dolby NR makes no attempt to remove noise once it has been mixed in with the music. Rather, it prevents noise from being added to the music as it is recorded in the first place. This two-step process first encodes the music when it is recorded, and then decodes it when the tape is played back. This is why the Dolby noise reduction system in the recorder should be switched on both when you make a cassette and when you play it. In recording, the Dolby NR circuit makes the quiet parts of the music, which are most susceptible to noise, louder than normal. When the encoded tape is played back, the Dolby NR circuit is switched around to in turn lower the previously boosted parts of the music. This automatically lowers any noise added to the music by the recording process, and it restores the music to its original form so that nothing is changed or lost but the noise.

Dolby AC-3 _ *Dolby Audio Coding-3* - The audio coding technology used in Dolby Digital.

Dolby B _ type noise reduction is the original Dolby system designed for consumer tape recorders. It is included in all but the least expensive cassette machines today, and is used in the preparation of the vast majority of prerecorded cassettes. It is also incorporated in many stereo VHS videocassette recorded to improve their linear audio tracks and, in a modified form, in Dolby Surround decoders. Dolby B-type provides 10 dB of noise reduction at the higher frequencies where tape hiss predominates.

Dolby C _ type noise reduction was developed to improve the cassette medium still further by providing twice the tape hiss reduction (20 dB) of Dolby B-type. It is offered along with Dolby B-type in a variety of midrange and premium cassette decks and players. Dolby C-type is also used in many professional videocassette recorders.

Dolby Digital _ The most widely used multichannel digital sound format in the world, used for everything from 35 mm films in the cinema to HDTV broadcasts and DVD discs in the home. Dolby Digital provides up to 5.1 channels (left, center, right, left surround, right surround, and low-frequency effects).

Dolby Digital Surround EX _ A variation of Dolby Digital that enables 5.1-channel Dolby Digital soundtracks to carry a third, center-rear surround channel for greater realism and more precise sound placement. Surround EX prints are compatible with all Dolby Digital cinemas, whether or not equipped to play the additional surround track.

Dolby E _ An audio compression scheme which can encode/decode up to eight channels plus metadata - typically 5.1 mix (six channels) and Rt/Lt (Right Total/Left Total surround) or stereo two-channel mix, etc - onto two AES/EBU bitstreams at 1.92 Mb/s (20-bit audio at 48 kHz). Thus video recorders, typically with four channels, can support the greater channel requirements of DVD and some DTV systems. With audio frames matching video frames, Dolby E is a professional distribution coding system for broadcast and post production which maintains quality up to 10 code/recode cycles.

Dolby HX Pro _ Not a noise reduction system, Dolby HX Pro makes it possible to record loud musical passages with fewer high-frequency losses and less distortion. It is available in better cassette decks and is also widely used by the recording industry to improve the quality of prerecorded cassettes, through its process of reducing the effects of tape saturation. As no encoding of the signal takes place, no playback decoding circuitry is required to realize the benefits of Dolby HX Pro.

Dolby Pro Logic _ A four-channel system consisting of left, centre, right and rear channel, (the single rear channel is usually played through two speakers).The VHS standard for delivering surround sound. All DD 5.1 receivers can decode Pro-Logic. Some older DVDs may be encoded with digital Pro-Logic signals.

Dolby Pro Logic IIx _ is the first and only technology to process any native stereo or 5.1 signal into a 6.1- or 7.1- channel output, creating a seamless, natural surround soundfield that immerses you in the entertainment experience. With Dolby Pro Logic IIx you can choose **Movie** or **Music modes** to tailor your listening experience to source material. **Music mode** also features three additional user controls: **Dolby Center Width** adjusts the balance of the main vocals in the center and front channels. **Dolby Panorama** creates a seamless, wraparound surround effect. **Dolby Dimension** creates a deeper or shallower surround sound field. Dolby Pro Logic IIx also incorporates an exclusive **Game mode** that delivers full-impact special effects signals panned to the surrounds.

Dolby S _ type of Noise Reduction. Introduced in 1990, Dolby S-type is based upon the principles of the professional Dolby SR (Spectral Recording) process. It not only provides still more tape hiss reduction (24 dB), but also reduces low-frequency noise by 10 dB. Thus, it permits recording high-level signals at the frequency extremes more accurately and cleanly. In listening tests conducted during 1995 it compared very favorably with compact disc recordings, with most listeners judging the quality of Dolby S-type encoded tapes as comparable with or in some cases superior to the playback quality of the CD. Dolby S-type is steadily gaining momentum and is being incorporated first in state-of-the-art decks for the most discerning listeners.

Dolby SR _ The most powerful analog Dolby system, Dolby SR (spectral recording) is used today for the analog soundtracks on virtually all releases, including those with digital tracks. Dolby SR soundtracks provide a dynamic range rivaling that of digital, are compatible with any 35 mm theatre, and provide backup in case of playback problems with digital tracks.

Dolby Stereo _ The original name for "Dolby Laboratories" multichannel analog soundtrack technology, whereby four channels of sound (left, center, right, surround) are encoded onto two soundtracks on the film, and then recovered in the cinema by means of a Dolby cinema sound processor.

Dolby Surround (Dolby Stereo, & Dolby 4:2:4) _ Matrix Analog coding of four audio channels - Left, Center, Right, Surround (LCRS), into two channels referred to as Right-total and Left-total (Rt, Lt). On play-

back, a Dolby Surround Pro Logic decoder converts the two channels to LCRS and, optionally, a subwoofer channel. The Pro Logic circuits are used to steer the audio and increase channel separation. The Dolby Surround system, originally developed for the cinema, is a method of getting more audio channels but suffers from poor channel separation, a mono limited bandwidth surround channel and other limitations. A Dolby Surround track can be carried by analog audio or linear PCM, Dolby Digital and MPEG compression systems.

Dolby Surround EX _ New sound format that sends unique signals to seven different speakers - Front left, front center, front right, rear left, rear center, rear right, and subwoofer. To experience Dolby Surround EX (also called Dolby Digital 6.1) you need a receiver than can decode the signal, or an add-on amplifier that can decode the extra rear center signal.

Dolby Surround Pro Logic _ The advanced form of Dolby Surround decoding found in virtually all home theater systems, providing at home from video sources the same four-channel surround sound heard in cinemas from Dolby analog theatrical films.

Domain Name _ A unique address that identifies an individual (or company's) Web site on the Internet. It usually contains two or more segments separated by full stops, such as www.hereisyourname.com. It's a lot easier to remember a short Domain Name than it is to remember the full IP Address of the Web Site.

Domain Name Server _ This is a special computer connected to the Internet whose job it is to keep track of the IP Addresses and Domain Names of other computers. If required, it can take the ASCII Domain Name and convert it into the relevant numeric IP Address.

Dominance _ Field dominance defines whether a field type 1 or type 2 represents the start of a new TV frame. Usually it is field 1 but there is no fixed rule. Dominance may go unnoticed until flash fields occur at edits made on existing cuts. Replay dominance set the opposite way to the recording can cause a juddery image display.

Dongle _ An electronic copyright protection device that attaches to a computer to allow access to a specific application. Dongles are typically attached to USB, ADB, and LPT ports.

DOS _ *Disk Operating System* - A simple operating system developed years ago by Microsoft that allows other systems to be installed and run on top of it, such as Windows. DOS does not support multiple users or multitasking.

Dot Clock _ Also referred to as "**pixel clock**". The timing device in a graphics card that determines the pixel resolution. The dot clock runs at a rate that produces the highest possible pixel resolution for that device. In a digital projector, the dot clock samples the analog video at a rate that produces the resultant pixel resolution.

Dot Crawl _ Sometimes called *"zipper effect".* Dot crawl refers to a specific image artifact that is a result of the composite video system. Dot crawl may be seen on TV news, for example, when a picture appears over the anchorperson's shoulder, or when some text appears on top of the video clip. If you look closely, along the edges of the picture, or the text that has been overlayed, you'll notice some jaggies "rolling" up or down.

Dot Pitch _ On a color screen, the measured distance in millimeters between a dot of a specific color - either red, green or blue - and the closest dot of the same color. The smaller the dot pitch, the more detailed and sharper the image. Dot pitch also determines the resolution of a screen (e.g., a computer monitor).

Dots Per Inch (dpi) _ A measurement of the scanning resolution of an image or the quality of an output device. DPI expresses the number of dots a printer can print per inch, or that a monitor can display, both horizontally and vertically.

Double Buffering _ As the name implies, you are using two buffers - for video, this means two frame buffers. While buffer 1 is being read, buffer 2 is being written to. When finished, buffer 2 is read out while buffer 1 is being written to. Also often used for rendering - while one of the buffers is being displayed, the other buffer is operated on by a rendering engine

Double System_ General expression for sound being recorded separately to vision.

Down Converting _ The process which changes the number of pixels and/or frame rate and/or scanning format used to represent an image by removing pixels. Down converting is done from high definition to standard definition. Often done to high definition camera reels so that programs can be offlined on inexpensive standard definition editing systems before being conformed in High Definition. Also done to finished HD programs for delivery to non-HD clients.

Downlink _ The frequency satellites use to transmit data to Earth stations.

Download _ Describes the process of receiving data, usually via the Internet or from another device such as a digital camera to a PC.

Downloadable Media _ Media (i.e., video and/or audio) that can be downloaded and written to disk (i.e., saved onto a computer hard drive); typically refers to media files hosted on a **Web server** (as opposed to a **media server**) which can, and often must, be entirely downloaded and written to disk in order to be played (as contrasted to **streaming media**).

Downloading _ The transfer of data, software updates, music, video or printable information etc, from either a specific IP address, a Web server, or via a clickable link on a Web page - to another computer (usually your own) "host" computer. Also, downloading files from another device such as a digital camera to a PC.

Downmixing _ Occurs when audio or video information on a disc is being sent to equipment that doesn't have capabilities to reproduce it. A common example of downmixing is when a Dolby Digital 5.1 track is sent to a stereo TV or Pro-Logic receiver. The audio will still sound great (better than VHS) but it will lose some dynamic range in the process.

Downward Compatible _ Also called **backward compatible**, it refers to hardware or software that is compatible with earlier versions.

DPCM _ *Differential PCM* - An audio digitization technique that codes the difference between samples rather than coding an absolute measurement at each sample point.

DPX _ *Digital Moving-Picture Exchange* - A file format specified by SMPTE that contains information about an image as well as the image itself.

Drag and Drop _ The process of moving text, graphics, or photos to different locations in a document.

DRAM _ *Dynamic RAM* - High density, cost-effective memory chips (integrated circuits). Their importance is such that the Japanese call them the "*rice of electronics"*. DRAMs are

used extensively in computers and generally in digital circuit design. In digital video equipment they also make up stores to hold pictures. Being solid state there are no moving parts and they offer the fastest access for data. Each bit is stored on a single transistor, and the chip must be powered and clocked to retain data. Synchronous DRAM (SDRAM) is fast, running up to 133 MHz. Current sizes available are up to 256 Mb (per chip) but, following years of rapid expansion development has slowed.

DRAM Buffer _ All digicams have a certain amount of fixed memory in them to facilitate image processing before the finished picture is stored to the flash memory card. Cameras that have a burst mode have much larger DRAM buffers, often 32MB or larger. This also makes them more expensive.

DRAW _ *Direct Read After Write* - Reading data immediately after it has been written to check for recording errors.

Drawing Program _ A graphics program used for creating illustrations. It maintains an image in vector graphics format, which allows all elements of the picture to be isolated, moved and scaled independent of the others. Drawing programs and CAD programs are similar; however, drawing programs usually provide a large number of special effects for fancy illustrations, while CAD programs provide precise dimensioning and positioning of each graphic element in order that the objects can be transferred to other systems for engineering analysis and manufacturing.

DRC _ *Digital Reality Creation* - Sony's DRC uses digital mapping to convert a conventional TV image into its high definition equivalent. The system creates four times as much data for a more solid, more convincing picture. With this new technology, television picture resolution is improved by doubling both the horizontal and vertical resolution in real time. The doubling of the scanning lines significantly improves picture density and visible scanning is almost completely eliminated.

Dreamcast _ Sega's last console achieved over 5m hardware sales following its Japanese release in 1998 and its western release in late 1999. The console features a proprietary GD-ROM delivery format and a modem. Sega has also launched Dream Arena, its online service and has already gained over 1m subscribers. No longer manufactured.

Dribbleware _ a) Software that is publicly displayed and previewed well in advance of its actual release. Dribbleware is one stage beyond vaporware. _ **b)** Software that is released in small increments, especially due to the ease with which updates can be downloaded from a Web site today.

Drive _ General term for component groups or complete devices including movable elements. The part of a video recorder threading up the tape or playing it is for example referred to as tape drive. Also devices by means of which CDs, disks or other removable storage media are played as well as hard disks and Raids are referred to as drives.

Driver _ A program that controls a device. Every device, whether it be a printer, disk drive, or keyboard, must have a driver program. A driver acts like a translator between the device and programs that use the device. Each device has its own set of specialized commands that only its driver knows. If you plug a device into a modern Windows based computer it will know it's there (because Windows is Plug & Play Compatible) and the computer will then set up the Drivers.

Driving/ racing/ flying Games _ Not surprisingly, in racing, flying, and driving games, a player drives a vehicle around a track to win a race or flies a plane through a series of missions or maneuvers. Vehicles range from cars and planes to go-karts (Mario Kart, Crash Team Racing), boats and hovercraft (Hydro Thunder, WipeOut), and in the case of Wave Race, Jet Skis. There is a lot of room for technique in racing games, and some techniques involve the use of weapons to give the player the upper hand.

DRM _ *digital rights management* - Server software that protects against the illegal distribution (a.k.a. pirating) of copyrighted content over the Internet.

Drop Frame Timecode _ Timecode that is accurate relative to actual video running time. The numerical reference drops two numbers every minute to allow for the fact that there are actually 29.97 frames of video per second, rather than 30 frames per second. Video editing software will sometimes allow you to export drop frame and non-drop frame video.

Drop Shadow _ A graphic art effect designed to simulate the shadow cast by three dimensional shapes.

Dropout _ The area of a magnetic tape where information is missing. Drop-out may occur due to dust, lack of oxide, or other causes. In analogue video visible as white specks or streaks. In digital, as blocks.

Dropout Compensator _ Technology that replaces dropped video with the video from the previous image's scan line. High-end time base correctors usually included a dropout compensator.

Dropped Frames _ Missing frames lost during the process of digitizing or capturing video. Dropped frames can be caused by a hard drive incapable of the necessary data transfer rate. Video editing software will usually tell if there are any dropped frames.

Drum Machine _ An electronic device, usually controllable via MIDI commands, that contains samples of acoustic drum sounds. Used to create percussion parts and patterns.

Drum Pad _ Synthetic playing surface which produces electronic trigger signals in response to being hit with drum sticks.

Drum Scanners _ A high-resolution digitizing device that can scan reflective or transparent art.

DRY _ A signal which has had no effects added.

DS0 _ Digital signal level zero, 64 kbps.

DS1 _ A telephone company format for transmitting information digitally. DS1 has a capacity of 24 voice circuits at a transmission speed of 1.544 megabits per second.

DS3 _ A terrestrial and satellite format for transmitting information digitally. DS3 has a capacity of 672 voice circuits at a transmission speed of 44.736 Mbps (commonly referred to as 45 Mbps). DS3 is used for digital television distribution using mezzanine level compression - typically MPEG-2 in nature, decompressed at the local station to full bandwidth signals (such as HDTV) and then re-compressed to the ATSC's 19.39 Mbps transmission standard.

DSB _ *direct-broadcast-satellite*

DSD _ *Direct Stream Digital.* A digital encoding format proposed by Sony and Philips used to record SACD albums. DSD samples an audio signal at a fixed rate (frequency) just as in the PCM method. However, instead of recording the volume or amplitude as an absolute number, as in PCM, the DSD method measures and records how much the volume has changed since the last measurement. If the signal is sampled fast enough, the amount of change since the previous sample would be very small. The proposal for DSD is for a sampling rate that's over 2 MHz (2 million times per second)! At this high speed the changes in signal strength can be represented with one bit. DSD also compresses the data resulting in a 2:1 reduction.. DSD will be able to provide a frequency response from DC to 100 kHz with a dynamic range of 120 dB.

DSL _ a) *Digital Subscriber Line* High speed Internet access lines for connections directly from a telephone switching station to a home or office, avoiding the slowdown between switching stations. _ b) *Digital Subscriber Loop*. It shares the same phone line as the telephone service, but it uses a different part of the phone line's bandwidth. It does not interfere with normal phone service because there is a significant amount of unused capacity in current phone wires. This will enable a person to hook up DSL modems that communicate with a local Internet Service Provider (ISP), but they will still be able to talk on the phone - both the modem and the voice telephone can use a single phone line simultaneously. _ c) *Dynamic Super Linear Bass* This electronically controlled equalizer circuit monitors low frequencies and automatically provides enhancement where roll-off occurs. DSL varies the compensation level according to the input signal level, resulting in deep, natural sounding bass response at all listening levels.

DSM CC _ *Digital Storage Medium Command and Control*. A protocol intended to provide the basic control functions and operations specific to managing an MPEG-2 system bitstream on digital storage media.

DSP _ a) *hardware* A specialized circuit used to manipulate large quantities of data in realtime for equalization, compression/expansion and reverberation; replicates the acoustics of a typical performance environment such as disco, hall, live, movie and more. _ b) *software* - Normally plugins that can be added to audio player software to affect the sound playback. Some DSPs allow you to clean up or enhance the sound quality, others allow you to alter it in extreme ways (distortion, flange, etc.).

DSS _ *Digital Satellite Service*. One of the terms used to describe DTV services distributed via satellite.

DST _ *Digital Storage Technology* - DST is based on the DCT format developed by Ampex. DST is frequently used in high-end post production as a backup medium.

DTCP _ *Digital Transmission Content Protection / Digital Transmission Copy Protection* - DTCP Specification is to allow for protected transmission of copy-protected material between digital devices like Pac's, DVD Players, and Digital TV's, five companies -- Hitachi, Intel, Matsushita (MEI), Sony and Toshiba have prepared the "5C" Digital Transmission Content Protection (DTCP) specification. The DTCP specification defines a cryptographic protocol for protecting audio/video entertainment content from illegal copying, intercepting and tampering as it traverses high performance digital buses, such as the IEEE 1394 standard. Only legitimate entertainment content delivered to a source device via another approved copy protection system (such as the DVD Content Scrambling System) will be protected by this copy protection system. The DTCP specification relies on strong cryptographic technologies to provide flexible and robust copy protection across digital buses.

DTP _ Acronym for desktop publishing, including typesetting, image handling and page composition.

DTRS _ *digital tape recording system*. A Tascam-orginated 8-channel digital tape format that uses Hi-8 tape.

DTS _ *Digital Theater Systems* - a multi-channel (5.1) digital audio encoding format created by Digital Theater Systems. The DTS format was introduced in theaters in 1993, with Steven Spielberg's blockbuster movie *Jurassic Park*. In addition, the DTS format has been applied to home CD's, Laser Disks, and DVD's. DTS audio, as used in DVD-Video's and CD's, is compressed approximately 3 :1 from PCM recorded with a sampling frequency of 96 kHz and a 20-bit sampling size. For DVDs that use DTS audio, the DVD - Video specification still requires that PCM or Dolby Digital audio still be present. In this situation, only two channels of Dolby Digital audio may be present (due to bandwidth limitations).

DTS-ES _ A competing audio format to Dolby Surround EX, DTS-ES sends unique signals to six different speakers - front left, front center, front right, rear left, rear right and subwoofer. Like Dolby Surround EX, you need decoding equipment to experience it.

DTT _ *Digital Terrestrial Television* - A term used in Europe to describe the broadcast of digital television services using terrestrial frequencies.

DTV _ *Digital Television* - The umbrella term used for the new broadcasting system adopted by the FCC in 1996. DTV includes all elements of digital broadcasting, including High and Standard Definition television, datacasting and multicasting - everything that can be broadcast to the home digitally whether by cable, satellite or terrestrially. DTV uses MPEG-2 compression to fit many SD channels (typically 4-6), or a single HD channel along with audio and some data services, into the "data pipe" carried in one "analogue" channel space. Despite the very high compression ratios used for video, around 40 :1, the pictures can still look good - depending on the type of material and its technical quality. Services such as video on demand typically use the wide bandwidth available in satellite services to supply many feeds so that any selected movie can be available within a tightly specified time-frame. There maybe a price to pay - the more channels, the heavier the compression, the poorer the pictures. As well as current line rates, field rates and aspect ratios, DTV is taken to include 16:9 and the higher resolution standards of HDTV.

DTV Team, The _ Originally Compaq, Microsoft and Intel, later joined by Lucent Technologies. The DTV Team promotes the computer industry's views on digital television - namely, that DTV should not have interlace scanning formats but progressive scanning formats only. (Intel, however, now supports all the ATSC Table 3 formats, including those that are interlace, such as 1080i.)

Dual Laser Pickup _ DVD technology that incorporates two independent laser systems. Enables reading multiple disc formats including DVD, CD, VCD, CD-R and CD-RW.

Dual Monitor _ Using two monitors with the same computer. This is accomplished by using two monitors and either two display adapters or one display adapter with dual ports. In configurations using two or more monitors, all monitors function as one, and the mouse pointer seamlessly moves between the screens. However, when used in NLE software, each monitor represents different desktop area.

Dual Scan Passive Matrix _ Newer version of the original passive matrix technology, where the screen is controlled by two processing systems. A bit faster than "single scan," response is still horrendously slow, they cannot do multimedia or video either. Contrast remains terrible. Dual scan is used in the least expensive LCD panels.

Ducking _ Ducking is used to automatically reduce signal levels when the level of a source signal exceeds a specified threshold. It is used for voice-over applications where, for example, level of background music is automatically reduced (made to "duck"), allowing an announcer to be heard clearly.

Duron _ AMD's processor Duron is based on its more powerful sibling, the Athlon, and takes name from a Latin derivative - "durare" meaning "to last "unit". It has 128KB/64KB of Level 1/2 cache - both on-die - a 200MHz front side system bus and enhanced 3DNow! technology. The 64KB of Level 2 cache compares with the 256KB of its Athlon sibling and the 128KB of its Celeron rival. AMD believed this was sufficient to provide acceptable performance in its target market whilst giving it a cost advantage over its rival Intel. Manufactured on AMD's 0.18 micron process technology the first Duron CPUs - based on the Spitfire core - were available at speeds of 600MHz, 650MHz and 700MHz. Confirming the transition away from slot-based form factors, these processors were available in AMD's new 462-pin Socket A packaging only.

DV _ DV stands for Digital Video. It is a videotape format which is was created by Hitachi, JVC, Sony, Matsushita, Mitsubishi, Philips, Sanyo, Sharp, Thomson and Toshiba. The term DV covers many different formats including MiniDV, DVCAM and DVCPRO. Often, MiniDV is incorrectly referred to as "DV". MiniDV is a DV format, but not all DV formats are MiniDV. DV is a 6.35 mm (0.25-inc h) wide tape in a range of products to record 525 lines/60 fields in NTSC or 625 lines/50 fields in PAL video for the consumer (DV) and professional (Panasonic's DVCPRO and Sony's DVCAM). markets. The format uses a digital intra-field DCT-based "DV" compression (about 5:1) to record 8-bit component digital video based on a 13.5 MHz luminance sampling. The consumer versions, and DVCAM sample video at 4:1:1 (525 lines/60 fields) or 4:2:0 (625 lines/50 fields) video and provide two 16-bit/48 or 44.1 kHz,

or four 12-bit/32 kHz audio channels onto a 4 hour 30 minutes standard cassette (125 x 78 x 14.6 mm) or smaller 1 hour "mini" cassette (66 x 48 x 12.2 mm). The video recording rate is 25 Mbps or 3.6MB/second.

DV25 _ The most common form of DV compression. DV25 uses a fixed data rate of 25 megabits per second.

DVB _ *Digital Video Broadcasting* - The Digital Video Broadcasting Project includes over 220 organizations in more than 30 countries worldwide. Members include broadcasters, manufacturers, network operators and regulatory bodies, committed to designing a global family of standards for the delivery of digital television. Numerous broadcast services using DVB standards are operational in Europe, North and South America, Africa, Asia, and Australia. The DVB Group has put together a satellite system, DVB-S, that can be used with any transponder, current or planned, a matching cable system, DVB-C, and a digital terrestrial system, DVB-T. The standards are based on the common MPEG-2 coding system. DVB is the European equivalent of the American DTV.

DVCAM _ A professional variant of the DV format developed by Sony that records a 15 micron track on a metal evaporated (ME) tape at a data rate of 25 Mb/sec (2.98 MB/sec). DVCAM uses DV compression of a 4:2:0 signal for 625/50 (PAL) sources and 4:1:1 for 525/60 (NTSC). Audio is recorded in one of two forms - four 12- bit channels sampled at 32 kHz, or two 16-bit channels sampled at 48 kHz. DVCAM is the exact same size as MiniDV and is backwards compatible with MiniDV. The format has the exact same resolution as MiniDV, however, the "track pitch" is wider on DVCAM. This means that the tape physically spins around the spools a bit faster than a MiniDV tape and therefore the video information is recorded over a longer span of tape. Being more broadly recorded onto the tape means the image is less prone to dropouts or loss in quality. MiniDV and DVCAM tapes and VTRs are widely compatible. For example, it is possible to record professional DVCAM signals onto consumer MiniDV tape. It is also possible to play back a MiniDV recording on a professional DVCAM machine. In a pinch, it is possible to use consumer media in professional DVCAM hardware.

DVCD _ *Double VideoCD* - pretty popular format in mainland China. Format itself is nothing new really, its just a regular VideoCD overburned to include 90 to 99mins per CD, compared to regular 74mins per CD in standard VideoCD format.

DVCPRO _ Panasonic developed the digital video tape format DVCPro on the basis of the DV format. The technical data of the DVCPro standard are similar to those of DV. There are, however, some differences - DVCPro uses a Track width of 18 mm. Tape speed is 33.8 mm/s, i.e. almost twice as fast as in the case of DV. Moreover, DVCPro works with other tape material, i.e. metal particle tape. The sampling ratio of DVCPro was determined at 4:1:1 and not at 4:2:0. It uses 12 tracks per frame for 625/50 sources and 10 tracks per frame for 525/60 sources. In doing so, the developers are trying to reduce vertical chrominance errors that appear as color smears after repeated copying in DV. Also the DVCPro Track frame looks different than in the case of DV. DVCPro records an additional CTL and a cue margin track. The CTL Track has advantages for linear editing, since shorter preroll times can be realized with equal or even better editing accuracy. The cue Track serves as an additional analog sound Track enabling the operator to hear the playing sound of a video recorder in jog and shuttle mode. There is a 4:2:2 (DVCPro 50) and progressive scan 4:2:0 (DVCPro 50P) version of the format, as well as a high definition version (DVCPro-HD).

DVCPRO 50 _ This variant of DV uses a video data rate of 50 Mbps - double that of other DV systems - and is aimed at the higher quality end of the market. Sampling is 4:2:2 to give enhanced chroma resolution, useful in post production processes (such as chromakeying). For enhanced signal sampling quality and higher data rate, the tape is played at double speed, thus reducing the running time per cassette by 50 % in contrast to DVCPro. DVCPro50 in the PAL version records 24 Tracks per frame, i.e. twice as many helical Tracks as DVCPro. DVCPro50 provides four instead of two digital audio channels for sound recording. They enable a resolution of 16 bits/48 kHz. Four 16-bit audio tracks are provided. The format is similar to Digital-S (D9).

DVCPRO 50P (Progressive Mode) _ This variant of DVCPRO uses a video data rate of 50 Mbps - double that of standard DVCPro system - to produce a 480 progressive picture. Sampling is 4:2:0.

DVCPRO HD _ This variant of DV uses a video data rate of 100 Mbps - four times that of other DV systems - and is aimed at the high definition EFP end of the market. DVCPRO HD employs a tape speed of 135.4 mm/s and a data rate of 100 Mb/s. Sampling is 4:2:2 and video compression is 6.7:1. There are eight 16-bit, 48 kHz audio tracks.

DVCPRO Professional Plug-in (P2) _ solid-state memory-based professional video system based on the DVCPRO compression scheme but using memory cards as a storage medium. That means no mechanisms, optical disc, hard disk drive, or tape deck offering the toughness and reliability in extreme conditions, such as intense cold, high humidity, rain, dust or snow, vibration or repetitive shock. Because it uses solid-state memory, a P2 card allows literally tens of thousands of data rewrites with no degradation. The P2 card is based on SD Memory Card technologies, the standard removable flash media for consumer use. The initial P2 card will allow 18 minutes of DVCPRO or nine minutes of DVCPRO50 recording on a card using the PCMCIA type II form factor. The high-speed data transfer feature of the P2 card makes high definition (HD) recording and playback possible. Panasonic plans to build a 128GB P2 card in the near future. That is more than two hours of HD at 100Mbps on a single P2 card. The ability to record DV, DVCPRO, DVCPRO50 and DVCPRO HD on the same P2 card represents also a clear migration path from SD to HD. Panasonic anticipates releasing a range of DVCPRO P2 series devices, including camera-recorders, VTR style recorders, and a 5.25-inch drive bay unit.

DVD _ *Digital Versatile Disc* - Digital optical storage medium in the form of an optical disc. The abbreviation was formerly used for the term Digital Video Disc, but was renamed later into Digital Versatile Disc to emphasize the variety of possibilities of this disc. The outer dimensions of the DVD correspond to those of an audio CD - diameter - 12 cm; 1.2 millimeters thick. DVD is characterized by its high storage capacity. It can be manufactured in various ways. The maximum version includes two layers on each side on which the data is stored. In this version the DVD can store 25 times as much information as the corresponding audio CD. DVD is also suitable as a storage medium in the field of computers. Here, the DVD is used as DVDROM and DVD-RAM. The DVD-RAM, however, is

based on a different storage method than all other DVD standards. For this reason, DVD-RAM is not compatible with DVD-ROM or DVD Video, which means that it cannot be played back by means of Consumer Electronic players, thus reducing the use of DVD-RAM exclusively to the use as a mass storage medium in the computer sector. The DVD format enables construction of downward-compatible devices. DVD home devices can therefore also play audio CDs, DVD-PC-drives can play additional CD-ROMs. The existing CD stock can therefore be used for other purposes. By including an number of refinements within the manufacturing and playing process, the storage capacity of the basic version of a DVD (single-sided, single storage layer) was enhanced by factor 7 in comparison with the CD. The functions, however, remained the same. The reached capacity of 4.7 GB will be enough for most applications in the following years (DVD-5). A feature film with a running time of 133 minutes can be stored on such a disc in various language and subtitle versions in the best picture quality nowadays available for consumers. (More than 500 lines horizontal resolution). Since it has to be expected that the demand for storage in the field of computer applications will increase even further in the future, the developers have integrated additional extension features. The maximum capacity is reached at 17 GB (DVD-18). The 27GB maximum is for a new experimental technology being developed by several electronics companies (Hitachi, LG, Matsushita (Panasonic), Pioneer, Philips, Samsung, Sharp, Sony, and Thomson). The format, designed mostly for HDTV usage, makes it possible to record over 13 hours of standard definition video on a 27 GB disc! A 50GB disc is coming!

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. The DVD Forum is working to promote the broad acceptance of DVD-RAM as a rewritable standard for DVD in IT industries and DVD-RW in the entertainment and consumer electronics industries. DVD Forum support is not necessary to win in the marketplace.

DVD Hardware Decoder _ A specialized card created for the sole use of decoding DVD streams. These cards also include a Video Out connection allowing you to view the DVD Streams on a T.V.

DVD Interactive _ DVD-Interactive provides additional interactive capability for users by being able to access additional content on the DVD and/or Web sites on the Internet.

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. The read-write specification was introduced by the DVD Forum in response to compatibility issues with DVD-RAM. It will be able to read discs written in DVD-ROM, DVD-Video, DVD-Audio, DVD-RW and DVD-R formats. It will be able to write discs in DVD-RAM, DVD-RW and DVD-R formats. So far, no optical drive manufacturer has announced plans to support the specification.

DVD Multi-channel audio _ DVD-Video supports PCM, MPEG and Dolby Digital audio, which can support anything from mono, stereo, Dolby Surround to 5.1 channels. It must use at least one of the formats and can have others as well. Digital Theatre Sound (DTS) and Sony Dynamic Digital Sound (SDDS) are options. Up to eight separate audio streams can be supported, allowing multiple language, audio description, directors commentary etc. For example, a release may have 5.1 Dolby Digital English, two-channel Dolby Digital Spanish with Dolby Surround, and mono French.

DVD Playback Assisting Display Adaptors These are display adaptors (VGA cards) that can assist with the playback of DVD titles to some degree. They do this by moving some of the mathematical process from the CPU to the Card itself. Accelerator cards can have two types of acceleration, either "Motion Compensation" or "iDCT" (Or Both). Some cards claim to have DVD acceleration, but in fact this is mostly hype. Chip makers claim they have "Packed to Planer" support and Alpha Blending. While these do accelerate DVD playback, it is not a new "DVD" specific feature. This feature was introduced to help MPEG-1 playback several YEARS ago, and 95% of the cards support it for at least a couple of years now.

DVD Regions _ The big movie companies who so far divided the world by the various T.V. standards (NTSC, Pal, etc...) started to fear the DVD. Since the DVD format is a digital medium and thus has no different broadcast standards for various world regions. So in order to discourage cross-country purchases of movie titles, they came with the infamous Region Scheme. This scheme basically divided our small planet into six regions. However, not all regions were created equal. Since 99.99% of the world film market is generated in the good old U.S. (which is region #1 if someone is wondering), all the DVD titles come out as Region #1 and only then transferred to the various other regions. Disks can be region-coded so as only to play in a particular region (as defined in the player), a set of regions or be "code-free". A region - coded disk can only play on a player that is allowed by the coding. The region numbers are - 1. Canada, US, US Territories 2. Japan, Europe, South Africa, Middle East (including Egypt) 3. Southeast Asia, East Asia (including Hong Kong) 4. Australia, New Zealand, Pacific Islands, Central America, South America, Caribbean 5. Former Soviet Union, Indian Subcontinent, Africa (also North Korea, Mongolia) 6. China

DVD Software Decoder _ A program written to decode the DVD stream using your computer's CPU power alone.

DVD+RW _ *DVD ReWritable* - Developed in cooperation by Hewlett-Packard, Mitsubishi Chemical, Philips, Ricoh, Sony and Yamaha, it is the only 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-10 _ Double-sided, single-layer DVD. Offers a maximum storage capacity of 9.4 GB.

DVD-18 _ Double-sided, dual-layer DVD which offers a current maximum storage capacity of 17 GB.

DVD-5 _ Single-sided, single-layer DVD on which a maximum of 4.7 GB of data can be stored.

DVD-9 _ Single-sided, dual-layer DVD on which a maximum of 8.5 GB of data can be stored.

DVD-Audio _ An audio standard for high quality audio recorded on DVD's that exceed the capacity and quality of CD's. An DVD-Audio disk is capable of recording audio with frequencies up to 96Khz (compared to CD's at 20kHz) and with a dynamic range of up to 144dB (compared to CD's 96d_ B). DVD-Audio supports multi-channel recordings. Launched in mid-2000.

DVD-R _ *DVD-Recordable* - A variant of the Digital Versatile Disk which can be written once. A DVD-R is a pre-form and corresponds to an empty tape in terms of functionality. _ **a)** Camcorder write-once record/ playback format that records linearly to DVD discs. Once finalized (in-camera), the disc can be played on most home DVD players. _ **b)** In a PC, the DVDR can be written by a in the formats DVD-Video, DVD-Audio or DVD-ROM. Generally, it should be possible to play back a recorded DVD-R with DVD drives of your PC and - in the case of DVD-Video formatted versions - with DVD players.

DVD-RAM _ Re-recordable DVD. This is a record-many-times DVD with capacities of 2.6 GB for single-sided, single layer and 5.6 GB for dual-sided. A DVD-RAM basically differs from a DVD-ROM in that both formats are not compatible with each other. This fact can be seen with the naked eye_ the DVDRAM is delivered in a housing referred to as "Caddy" and looks more like a large diskette. For television the medium is being used in some new camcorders and offers instant access to shot material and record loop features - useful when waiting to record an event, like a goal, to happen. At home it could provide a removable media alternative to VHS video tape. 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 4.7GB 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-RAM_ 2.6 GB (per side, 1 layer) (rewritable)

DVD-RAM_ 4.7 GB (per side, 1 layer) (rewritable)

DVD-ROM _ First introduced in 1997, this read-only DVD disc is used for storing data and interactive sequences as well as audio and video. Uses the UDF file format and of-

fers up to 4.9 GB of data storage on each layer, e.g. a complete library of books, such as the Encyclopedia Britannica, for example. DVD-ROMs run in DVD-ROM or DVD-RAM drives, not DVD-Video players connected to TVs and home theaters. However, most DVD-ROM drives will play DVD-Video movies. DVD-ROMs will soon be available in all DVD-storage versions (DVD, DVD-5, DVD-9, DVD-10, DVD-18).

DVD-Rom DMA _ Without enabling DMA (Direct Memory Access) your DVD-Rom drive has to transfer all the data from the DVD to the computer memory using the CPU. This takes valued CPU time away from the computer and will cause massive slowdowns when trying to play DVDs (missing frames ...).

DVD-ROM Drive _ This is a Digital Versatile Disc (or a super-duper CD-Rom drive) that'll play movies. It's a read only memory drive that will also play both normal CD-ROM discs and DVD-ROM discs.

DVD-Video _ *Digital Versatile Disc-Video* One possible DVD format. Common especially in the field of home entertainment with movies as content. The sound on a DVD-Video can be set to different languages, and subtitles in even more different languages can be integrated. The same video Sequence can be located on the disk in different camera positions. The user can then select the desired sound, fade-in subtitles and switch between the different camera positions. In the case of DVD-Video, the picture material is coded according to MPEG-2 (MP@ML), thus realizing data rates of up to 9.8 Mbps. As a rule, only data rates between 2 and 8 Mbps are used. A motion picture with a duration of approx. 135 minutes can be stored on a DVD-5 in this quality. The standard provides DVD-variants for which video material is coded with a reduced resolution (according to MPEG-2 SP@ML and MPEG-1). These versions are suitable for DVD applications that require storage of a maximum of material. The sound for DVD-Video can be stored in different formats. It is generally possible to store the sound on a DVD as uncompressed PCM sound (up to 24 bits/96 kHz) or uncompressed audio format (Dolby digital AC-3 or MPEG-1 Layer 2 MP2). A DVD-Video has to offer at least one of these formats. Right after the introduction of DVD, the US and Europe disagreed on the question in which format the sound was to be stored. The NTSC countries soon chose Dolby Digital (AC-3), whereas the PAL countries concentrated on MPEG. Meanwhile both formats are allowed in Europe, and both compression standards are also supported in NTSC countries.

DVE _ *Digital Video Effects* - These have been supplied as separate machines but increasingly are being included as an integral part of systems. The list of effects varies but will always include picture manipulations such as zoom and position and may go on to rotations, 3D perspective, page turns, picture bending, blurs etc. Picture quality and control also vary widely.

D-VHS _ Digital tape format with that is able to store digital data such as MPEG-2 from a digital satellite system (DSS) or other sources. The idea of a D-VHS recorder can be summarized in simple terms: the recorder simply writes all incoming data to the tape. The respective decoder then decodes the data during playback. D-VHS decks support both standard (SDTV) and high definition (HDTV) formats and also record and play regular analog VHS tapes.

DVI _ *Digital Visual Interface* - DVI is a standard that defines the digital interface between digital devices such as projectors and personal computers. For devices that support DVI, a digital to digital connection can be made that eliminates the conversion to analog and thereby delivers an unblemished image. DVI-D is a digital-only connector; a DVI-I connector handles both analog and digital. DVI-A is available as a plug (male) connector only and mates to the analog-only pins of a DVI-I connector. DVI-A is only used in adapter cables, where there is the need to convert to or from a traditional analog VGA signal. DVI-CE (now known as **HDMI**) is a proposed modified version of DVI that is targeted for consumer equipment. It includes audio capability and uses a smaller connector.

DVITC _ *Digital Vertical Interval Timecode* digitizes the analog **VITC** waveform to generate 8-bit values. This allows the VITC to be used with digital video systems.

DVTR _ *Digital Video Tape Recorder* - The first DVTR for commercial use was shown in 1986 working to the CCIR 601 component digital standard and the associated D1 standard for DVTRs. Today many DVTR are available.

DVx Chip _ A microprocessor specialized for encoding and decoding MPEG-2 video from C-Cube Microsystems, Inc., Milpitas, CA. The single chip contains a SPARC processor, Motion Estimation engine (analyzes frames) and a Video DSP unit that handles low-level computations. For HDTV and other high-resolution formats, multiple DVx chips can be strung together via interprocess channels.

Dye Polymer Recording _ An optical recording technique that uses dyed plastic layers as the recording medium. WORM disks typically use a single layer, and erasable disks use two layers: a top retention layer and a bottom expansion layer. A bit is written by shining a laser through the retention layer onto the expansion layer, which heats the area and forms a bump that expands into the retention layer. The retention layer bumps are the actual bits read by the unit. To erase a bit, another laser (different wavelength) strikes the retention layer and the bump subsides.

Dynamic _ Refers to operations performed "on the fly," which are based on decisions made while the program is running rather than beforehand. The expression, "buffers are dynamically created," means that space is created when actually needed, not reserved ahead of time. The expression, "data is compressed onto the disk dynamically" means that the compression algorithms are being applied when the data is being written rather than before.

Dynamic Compression _ The ability to compress and decompress data in real-time; for example, as it's being written to or read from the disk.

Dynamic Disk _ A Windows 2000 feature that allows a single disk reference to span more than one physical disk volume. It also allows the disk to be resized without rebooting (resized "dynamically"). When formatted as a dynamic disk, the volume does not contain partitions. A regular disk partition is called a "basic" disk.

Dynamic Headroom _ The ability of an audio device to respond to musical peaks. For example, an amplifier may be capable of a sustained 100 watts only, but may be able to achieve peaks of 200 watts for the fraction of a second required for an intense, quick sound. In this example the dynamic headroom would equal 3 dB.

Dynamic HTML _ a) A general term for Web pages that are customized for each user; for example, returning values from a search. _ b) (Dynamic HTML) A combination of HTML enhancements, scripting language and interface that are used to deliver animations, interactions and dynamic updating on Web pages. The two major elements are the ECMAScript language and the DOM object model. ECMAScript is a derivative of JavaScript, and DOM is an interface that presents the HTML document to the programmer as an object model for ease in updating.

Dynamic IP Address _ Every computer on the Internet is identified by a unique number called an IP Address, but unlike a Static IP Address every time you connect to the Internet you'll be assigned an IP address from a pool of addresses maintained by your ISP on a first-come first-served basis, so it will be different every time.

Dynamic Media _ Refers to design elements that incorporate motion and/or sound such as video, animation, and audio.

Dynamic RAM _ The most common type of computer memory, also known as D-RAM or DRAM. It usually uses one transistor and a capacitor to represent a bit. The capacitors must be energized hundreds of times per second in order to maintain the charges. Unlike firmware chips (ROMs, PROMs, etc.) both major varieties of RAM (dynamic and static) lose their content when the power is turned off.

Dynamic Range _ a) *Bit-depth* The number of colors or shades of grey that can be represented by a pixel. The smallest unit of data stored in a computer is called a bit. Dynamic range is a measurement of the number of bits used to represent each pixel in a digital image. _ b) The range between the loudest and the softest sounds that are in a piece of music or that can be reproduced by a piece of audio equipment without distortion. This is a ratio expressed in decibels (dB).

Dynamic Rounding _ The intelligent truncation of digital signals. Some image processing requires that two signals are multiplied, for example in digital mixing, producing a 16-bit result from two original 8-bit numbers This has to be truncated, or rounded, back to 8-bits. Simply dropping the lower bits can result in visible contouring artifacts especially when handling pure computer generated pictures. Dynamic Rounding is a mathematical tech-

nique for truncating the word length of pixels - usually to their normal 8-bits. This effectively removes the visible artifacts and is non-cumulative on any number of passes. Other attempts at a solution have involved increasing the number of bits, usually to 10, making the LSBs (least significant bit) smaller but only masking the problem for a few generations.

Dynamic Tracking _ A video head's ability to find and follow an adjacent track by bending back and forth. Dynamic tracking offers true freeze-frame instead of freeze-field, variable-speed playback, and playing in reverse.

Dynamics _ the relative loudness or softness of a piece of music.

Early Reflections _ The first sound reflections from walls, floors and ceilings following a sound created in an acoustically reflective environment.

Earth Station _ A dish for reception of satellite communication.

Easter Egg _ a) An undocumented function hidden in a program that may or may not be sanctioned by management. Easter Eggs are secret "goodies" found by word of mouth or accident. For example, in Windows applications, pressing some key combination when the About box is open (Help/About) often displays the names of the developers who worked on the software. _ **b)** Special feature on DVD only savvy users can discover. It's usually a documentary, hidden audio track, theatrical trailer or TV trailer.

EAV_ *End of active video* in component digital systems.

EBKAC _ Digispeak for "error between keyboard and chair.".

E-book _ *Electronic Book* - A handheld device that is specialized for displaying electronic versions of books. Like its printed counterpart, an e-book lets you set bookmarks and annotate in the margins.

EBU _ *European Broadcast Union* - The European Broadcasting Union (EBU) is headquartered in Geneva, Switzerland and works on behalf of its European members. The EBU negotiates broadcasting rights for major sports events, operates the Eurovision and Euroradio networks, organizes program exchanges, stimulates and coordinates co-productions, and provides a full range of other operational, commercial, technical, legal and strategic services. At its office in Brussels, the EBU represents the interests of public service broadcasters before the European institutions. The EBU was founded in February 1950 by the pioneers of radio and television in Western Europe. It merged with the OIRT - the former union of eastern European broadcasters - in 1993. Apart from its active members in Europe, North Africa and the Middle East, the Union has 49 associate members in 30 countries outside of Europe. These include the Asia Pacific Broadcasting Union (ABU), the North American Broadcast-

ers" Association (NABA), the Union of National Radio & Television Organizations of Africa (URTNA), the Arab States Broadcasting Union (ASBU), and the Organization de la Television Iberoamericana (OTI). The Union is involved in radio data system (RDS), digital audio broadcasting (DAB), digital television (DVB), and high- definition TV (HDTV).

EBU timecode _ The timecode system created by the EBU and based on SECAM or PAL video signals.

ECAD _ Acronym for Electronic CAD. CAD tools specializing in the design of ICs and electronic systems.

ECC _ a) *Error Check and Correct -* A block of check data, usually appended to a data packet in a communications channel or to a data block on a disk, which allows the receiving or reading system both to detect small errors in the data stream (caused by line noise or disk defects) and, provided they are not too long, to correct them. _ **b)** *Error Correction Code*. A system of scrambling data and recording redundant data onto CD as it is recorded. During playback, this redundant information helps to detect and correct errors that may arise during data transmission.

ECC On-the-Fly _ A hardware correction technique that corrects errors in the read buffer prior to Host transfer without any performance penalties. These error corrections are invisible to the host system because they do not require assistance from the drive's firmware. Also known as Reed Solomon ECC On-the-Fly.

Echo _ the repetition of a sound delayed in time by at least 50 milliseconds after the original. An effect often found in synthesizers and samplers.

E-Cinema _ *Electronic cinema* - *also D-Cinema*. Typically the process of using video at 1080/24p instead of film for production, post production and presentation.

ECL _ Emitter coupled logic - A family of high speed, low power IC logic devices. Also called "current mode logic". Also, a digital signal type with an amplitude of -0.9V peak-to-peak sometimes used in monochrome workstations for high-resolution, short distance signal transmission.

E-commerce _ The selling of either goods or services by advertising on the Internet. The up to date way of doing business.

EDA _ *Electronic Design Automation* - The use of software tools to design, simulate, and verify a single chip or an entire electronic system. Using these tools, designers can verify that circuits work before production begins

EDC _ *Error Detection Code* - 32 bits in each sector that are used to detect errors in the sector data.

Edge Enhancement _ A signal-processing operation that accentuates edge details within an image to increase the apparent sharpness. Such operations may also be called aperture correction, sharpening, or peaking.

EDH _ *Error detection and handling* for recognizing inaccuracies in the serial digital signal. It may be incorporated into serial digital equipment and employ a simple LED error indicator.

Edit Master _ The first generation (original) of a final edited tape.

Edit Point _ The location on a video tape at which a production edit (e.g., an effect) occurs.

EDL _ *Edit Decision List* is a list, in table format, of the cutting data of the film in the form of timecode values. The EDL is generated automatically during editing by many editing systems and can be saved to a disk. When working in off-line/on-line mode, the editing decision list is of vital importance. The EDL generated in off-line editing is read into the on-line system as a basis for the final cut. The problem inherent in this process is that while the EDL contains all of the timecode values required for post-editing, it does not include any information about effects, color corrections, sound level settings or similar items of information. Hence, inserting a diskette containing the EDL into the online editing control is generally not all there is to on-line editing; instead, effects and picture corrections must be reproduced. There are various EDL formats such as Sony, CMX and CVG which can, however, be converted to one another by means of appropriate software tools.

EDO DRAM _ *Extended Data Out RAM* - A type of dynamic RAM chip that improved the performance of fast page mode (FPM) memory. As a subset of fast page mode, it can be substituted for page mode chips. However, if the memory controller is not designed for the faster EDO chips, the performance will remain the same as fast page mode. EDO eliminates wait states by keeping the output buffer active until the next cycle begins. BEDO (Burst EDO) is a faster type of EDO that gains speed by using an address counter for next addresses and a pipeline stage that overlaps operations.

EDTV _ *Enhanced definition television* - A television system featuring advanced encoding and transmission methods. Not as sophisticated as HDTV (high definition television), this first-generation system is compatible with existing TV sets and transmission methods. It is capable of displaying at least 480 progressive active scan lines in either a 4:3 or 16:9 aspect ratio, minimum 480p, with the reproduction or pass through of Dolby Digital 5.1 audio.

Edutainment _ Refers to leisure programs that educate as well entertain. e.g. talking books, interactive encyclopedias and geographical games.

EE _ Electronics to Electronics. When the video input of a VCR is connected to the output.

EEE 1394 _ Standard for fast, serial data transmission at up to 400 Mbits/s. The slightly modified version for transmitting DV signals is referred to as - I.LINK. IEEE 1394 was developed by Apple and introduced under the name Firewire. Different devices such as Camcorders, recorders as well as printers, scanners, CD drives and hard disks can be linked to one another via IEEE 1394. IEEE 1394 today supports up to 16 devices per system and enables a maximum of 63 devices to be connected. Until today, the cable length was limited to 4.5 meters, but this problem will be solved in the future by using fiberglass cables. IEEE 1394 networks are then also possible.

EEPROM _ *Electrically erasable programmable read only memory* - The information in an EEPROM is erased by exposing it to an electrical charge. Similar to EPROM except in the way in which information is erased.

Effect _ Distortion of a frame or frames of video to change its appearance; distortion of audio to alter the quality of sound.

Effects Loop _ Connection system that allows an external signal processor to be connected into the audio chain.

Effects Return _ Additional mixer input designed to accommodate the output from an effects unit.

EFI _ The BIOS has evolved very little since the birth of the PC in 1981, remaining a chunk of hand-crafted assembly language code most users know only for the series of arcane configuration and test messages fleetingly displayed when they turn on their PC. Intel first signaled that all that was about to change in early 2000, with the release of the first version of its Extensible Firmware Interface (EFI) specification, a proposed standard for the architecture, interface and services of a brand new type of PC firmware, designed to provide a well-specified set of services that are consistent across all platforms. EFI services are divided into two distinct groups, those that are available only before the operating system is loaded, known as "Boot Services" and those that are also available after EFI has assumed its minimum footprint configuration, known as "Runtime Services." Boot Services provide the breadth of functionality offered by EFI for platform configuration, initialization, diagnostics, OS kernel image loading and other functions. Run-time Services represent a minimum set of services primarily used to query and update non-volatile EFI settings.

EFP _ Electronic Field Production. The use of small. high quality recording equipment for purposes other than news gathering.

EGA _ *Enhanced graphics adapter* Introduced by IBM in 1984 (replaced CGA – color graphics adapter), the EGA graphics card is configured by DIP switch settings to provide an MDA or CGA output signal. The signal type is TTL, non-interlaced with a pixel line resolution of 640 x350, and can display 16 colors from a palette of 64 colors (16/64). EGA horizontal scan frequency is 21.8 kHz or 15.75 kHz in CGA mode. Vertical frequency is 60 Hz. The EGA card outputs to a 9-pin "D" type connector.

Egosurfing _ Using a WEB search engine to see how many times your own name is cited. A popular, quasi-competitive sport at Silicon Valley parties and at gatherings of writers, artists, musicians and others who have some expectation of being referred to on the Web or in a newsgroup.

E-government _ *Electronic Government* - A generic term for Web-based services from agencies of local, state and federal governments. Such Web sites provide a wide variety of services to the public and have been extremely helpful in reducing internal paperwork. For example, the myriad of forms that government agencies require can typically be downloaded from a Web site. When information on the site is clearly indexed and explained, the number of support calls is dramatically reduced compared to the days before the Web.

EIA _ *Electronics Industries Association* The association that determines recommended audio and video standards in the USA.

EIDE _ *Enhanced Integrated Drive Electronics* - Improves the AT-IDE standard interface by overcoming device support and capacity limitations, improving Data Transfer Rates, and allowing connection of CD-ROMs and other peripherals. It also specifies a new BIOS for supporting hard disks greater than 504MB. In practice, the terms EIDE and IDE are synonymous.

EISA _ The standard abbreviation for Extended Industry Standard Architecture. 32-bit Bus for PCs

EL display _ *Electroluminescent display* - A flat panel display technology that provides a sharp, clear image and wide viewing angle. It contains a powdered or thin film phosphor layer sandwiched between an x-axis and a y-axis panel. When an x-y coordinate is charged, the phosphor in that vicinity emits visible light. The phosphors are more like semiconductor materials than those used in a CRT. Most EL displays are monochrome, typically yellow orange. Although some of the first portable computers used EL displays, they are mostly used today on instrumentation in demanding industrial and medical applications that require long life and crisp images. EL screens range from 3/4" to 10" and larger, but are more cost effective in the smaller sizes. Active matrix EL is an advanced EL technology that uses a transistor at each pixel. It is used to make small head mounted displays (HMDs) that require very sharp images.

Electroluminescence _ The generation of light by applying electricity to a material such as a semiconductor or phosphor. LEDs, laser diodes and electroluminescent displays are examples.

Electronic _ The use of electricity in intelligence-bearing devices, such as radios, TVs, instruments, computers and telecommunications. Electricity used as raw power for heat, light and motors is considered electrical, not electronic. Although coined earlier, "Electronics" magazine (1930) popularized the term. The magazine subheading read "Electron Tubes - Their Radio, Audio, Visio and Industrial Applications." The term was derived from the electron (vacuum) tube.

Electronic Programming Guide (EPG) _ An application that provides an on-screen listing of all programming and content that an interactive television service subscriber or digital television viewer has available to them.

Electro-optic _ Combining electronics and optics. Most photonic systems use electricity as their source. For example, a laser is pulsed with electricity to produce light pulses.

Electrostatic Speaker _ A speaker that radiates sound from a large diaphragm that is suspended between high-voltage grids.

Element _ A image, or line art, in whole or part of the page, composite or file.

Elementary Stream _ MPEG-2 data streams can consist of different components. If video and audio data are saved and handled separately, the data stream is referred to as Elementary Stream which is, among other applications, also suitable as a source for DVD-Authoring Systems. Video and audio linked to each other in bundles is referred to as program stream which is also used in the case of DVD-video.

Eliminate _ A procedure for removing media from a video program and also removing the space that the media occupied in the program. Using Eliminate forces the remainder of the program to adjust accordingly and shortens the length of the entire program. Sometimes called a ripple edit.

Elliptical Dot _ A halftone screen dot that can produce better tonal gradations than a circular dot.

E-mail _ *Electronic Mail* - A method of communicating with other persons by sending and receiving electronic mail messages via an ISP's server to other locations for the attention of another computer user at a specific E-mail Address. The Web browser can also substitute for the mail program. The Internet revolutionized e-mail by turning countless incompatible islands into one global system. The Internet initially served its own members, of course, but then began to act as a mail gateway between the major online services. It then became "the" messaging system for the planet. In the U.S., Internet mail is measured in the trillions of messages each year.

Emanation _ Any modulated signal (sound or electromagnetic radiation) leaking from a device that may be used to reconstruct information being processed or transmitted by that device.

Embedded Audio _ Audio signal included in a digital signal like the SDI signal.

Embedded Editing _ Editing at a workstation which directly edits material stored in a server. For this the workstation does not need large-scale video and audio storage but depends totally on the server store. The arrangement allows background loading of new material, via several ports if required, and play-out of finished results, while removing the need to duplicate storage or transfer material to/from the workstation and allowing any number of connected workstations to share work. The efficiency of embedded editing allows fast throughput and is specially attractive to news as well as to post production.

Embedded Processor _ A CPU chip used in a system other than a general purpose workstation, desktop or laptop computer. Such chips are used by the billions every year in a myriad of products.

Embedded Software _ can be as simple as the microcode instruction set of a microprocessor or as complex as the security software inside a set-top cable modem box. Embedded software performs a specific function not under the control of the primary user and is often used in conjunction with a digital signal processor and mixed-signal devices to form a DSP Solution.

Embedded System _ Any electronic system that uses a CPU chip, but that is not a general-purpose workstation, desktop or laptop computer. Such systems generally use microprocessors, or they may use custom-designed chips or both. They are used in automobiles, planes, trains, space vehicles, machine tools, cameras, consumer and office appliances, cellphones, PDAs and other handhelds as well as robots and toys. The uses are endless, and billions of microprocessors are shipped every year for a myriad of

applications. Although there are embedded versions of popular operating systems, low-cost consumer products can use chips that cost less than a dollar and have very limited storage for instructions. In such cases, the OS and application may be combined into one program. In embedded systems, the software is permanently set into a read-only memory such as a ROM or flash memory chip, in contrast to a general-purpose computer that loads its programs into RAM each time. Sometimes, single board and rack mounted general-purpose computers are called "embedded computers" if used to control a single printer, drill press or other such device.

Embedded Web server _ Web server software embedded within a hardware device such as a print server. It is widely used in a myriad of devices, because it allows access to the software via any Web browser, typically for configuring the device or obtaining reports.

Emoticons _ *Emotional Icons* - Also called a "smiley," it is an expression of emotion typed into a message using standard keyboard characters. These sideways smiles and frowns started with simple **-)** and developed into the whole system of symbols: **:-)** smile; **:-(** frown; **;-)** wink; **:-D** big smile; **:-O** mouth open in amazement; **:-Q** tongue hanging out in nausea; **:-{)** smile (user has moustache); **:-{)}** moustache and beard; **8-)** smile (user wears glasses); **(-:** smile (user left handed or Australian); **:*)** red nosed smile, ***<|:{)}** Santa Claus!; **@:{)===** Sikh with turban and long beard.

E-movie _ Short movies that can be made in MPEG-1 format, using a resolution of 160 x 112 and send electronically.

Emphasis _ In an effort to improve the already-excellent signal-to-noise ratio of the compact disc, CDs (as well as digital tapes) can be recorded with emphasis. If it is decided to use emphasis, the recording is made with a high frequency boost (called Emphasis), and during playback, a corresponding high frequency rolloff (called De-emphasis) is applied. Thus, in theory, signal-to-noise is improved. An automatic flag in the PQ subcode tells the CD player when to use de-emphasis. There have been many problems with the use of emphasis (loss of headroom, wrong PQ codes, inaccurate de-emphasis circuits) and therefore most CDs made today do not use emphasis.

Emulation _ The imitation of a hardware system by software programs. Emulation is used effectively to re-create many older video game systems on a personal computer. Many programmers actually add features to their program (or "emulator") that did not exist in the original. Games for emulators can often be downloaded from the Internet in the form of ROM images.

Emulation Mode _ An operational state of a computer when it is running a foreign program under emulation.

Emulator _ A device that is built to work like another. A computer can be designed to emulate another model or CPU type and execute software that was written to run in the other machine. A terminal can be designed to emulate various communications protocols and connect to different networks. Years ago, "emulator" always meant hardware, and "simulator" always meant emulation via software. Today, the term can refer to hardware, software or a combination of the two.

Encode _ To merge the individual digital or analog video signals (e.g., red, green, and blue) into a combined signal.

Encoder _ **a)** Converting to a code. A software application or a device (hardware) that can encode raw data into a compressed format, which may be any of thousands in existence. _ **b)** A device often built into video cameras that changes individual component signals into composite signals. An encoder combines Y (luma) and C (chroma) signals to produce a video image.

Encoding _ Encoding accomplishes two main objectives _ **a)** it reduces the size of your video and audio files, by means of compression, making Internet delivery feasible, and _ **b)** it saves your files in a format that can be read and played back on the desktops of your targeted audience. Some encoding solutions may also be configured to provide additional processing functions, such as digital watermarking, for example. Encoding may be handled by a software application, or by specialized hardware with encoding software built in. Note that the term *compression* is often used interchangeably with the term "encoding" when referring to the final step in preparing media files for Web distribution; but compression is only a part of the encoding process.

Encryption _ Manipulating information into a coded form that cannot be read without a device that will unscramble the code. Video signals are also scrambled in cable and pay-TV systems so that the viewer must pay to receive the program after it has been electronically deciphered. For digital cinema, this process is done to help secure and protect motion picture content delivered via a digital distribution means such as DVD, satellite or broadband.

End-to-end Digital Cinema Distribution _ All of the stages for taking a motion picture from a studio master to a theater's digital projection system.

ENG _ *Electronic News Gathering* - This term is nowadays mainly used for describing the shooting of short news reports with teams consisting of one or two members. The equipment used for this purpose is easier to handle and more robust than studio equipment.

Engine _ a) Just like your car engine is surrounded by all the other bits that make it work, in a computer program the engine is the main piece of software around which all the other features or functions are built. **_ b)** A video game's engine is the main program that controls all of the game's functions, from calculating collision, physics, and the position of onscreen objects, to receiving input from the player and outputting sounds at the right volume. The engine ties everything in the game together and causes it all to happen. It contains an enormous amount of code and is the main programmer's primary responsibility in a game.

Enhanced TV _ Also known as "datacasting." This term is used for certain digital on-air programming that includes additional resources downloaded to viewers. Some forms of enhanced TV allow live interaction; other forms are not visible on-screen until later recalled by viewers. Producers add these options to some digital programming to enhance program material - allowing viewers the ability to download related program resources to specially equipped computers, cache boxes, set-top boxes, or DTV receivers.

Enhancements _ Producers add these to interactive and digital television, as well as other digital content to enhance program material. Examples are supplementary text and graphics that add more depth and richness, or links to reach a Web site, as is done using

TV Crossover Links. In analog, the vertical blanking interval (VBI) is used to broadcast enhancements, while in digital, the enhancements are part of the ATSC MPEG-2 stream. Enhancements can be created using industry-standard tools and technologies, like HTML and the ECMA Internet Scripting.

Enhancer _ A device designed to brighten audio material using techniques such as dynamic equalization, phase shifting and harmonic generation.

ENIAC _ *Electronic Numerical Integrator And Computer* - The first operational electronic digital computer developed for the U.S. Army by J. Presper Eckert and John Mauchly at the University of Pennsylvania in Philadelphia. Started in 1943, it took 200,000 man-hours and nearly a half million dollars to complete two years later. Programmed by plugging in cords and setting thousands of switches, the decimal-based machine used 18,000 vacuum tubes, weighed 30 tons and took up 1,800 square feet.

Enterprise _ The series of computers employed largely in high-volume and multi-user environments such as servers or networking applications; may include single-user workstations required in demanding design, engineering, and audio/visual applications.

Entropy _ Disorder or randomness. In data compression, it is a measure of the amount of non-redundant and non-compressible data in an object (the amount that is not similar). In encryption, it is the amount of disorder or randomness that is added. In software, it is the disorder and jumble of its logic, which occurs after the program has been modified over and over.

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.

Entry point _ A point in a coded bit stream from which a complete picture can be decoded without first having to store data from earlier pictures. In the MPEG-2 frame sequence this can only be at an I-frame - the only frames encoded with no reference to others.

Envelope _ The way in which the level of a sound or signal varies over time, including alterations in a sound's amplitude, frequency and timbre.

Envelope Generator _ A device or process in a synthesizer or other sound generator that creates a time varying signal used to control some aspect of the sound.

Environment _ A particular configuration of hardware or software. "The environment" refers to a hardware platform and the operating system that is used in it. A programming environment would include the compiler and associated development tools. Environment is used in other ways to express a type of configuration, such as a networking environment, database environment, transaction processing environment, batch environment, interactive environment and so on.

EOB _ *End of Block*.

EPG _ *Electronic Program Guide* - It's initial implementation has been in the cable industry where an on screen guide to television programming is provided. There are now service providers and equipment that have interactive version of a program guide. They allow the user to point at a program, then do something with it such as making sure it is recorded or that the set is turned on and properly tuned at the program comes on.

EPOC _ A 32-bit operating system for handheld devices from Symbian Ltd., London. Used in Psion and other handheld computers, it supports Java applications, e-mail, fax, infrared exchange, data synchronization with PCs and includes a suite of PIM and productivity applications.

EPP _ *Enhanced Parallel Port* - the newer hi-speed, bidirectional printer port on modern computers. Some older digicams and scanners use the EPP port to transfer data.

EPROM _ *Erasable Programmable Read Only Memory -* A device that can store information (instructions or data) and retain it when power is removed. An EPROM is erased by exposing it to ultraviolet light. New information is loaded into the EPROM using a PROM programmer or "burner". EPROMS are expected to eventually give way to flash memory.

EPS _ *Encapsulated PostScript* - a file format used to transfer PostScript image information from one program to another. The file includes PostScript code for the actual image and a low resolution representation of the image for display purposes. EPS files require a Postscript-language printer to properly render the image they contain.

EQ _ *Equalizer -* Device for selectively cutting or boosting selected parts of the audio spectrum.

Equalizing Pulses _ These pulses cause the vertical deflection to start at the same time in each interval. They also keep the horizontal sweep circuits in step during the portions of the vertical-blanking interval immediately preceding and following the vertical sync pulse.

Ergonomics _ The science of designing machines, tools and computers so that people find them easy and comfortable to use.

Ergs & Ohms_ Highly technical expression for things electric.

ERI - JPEG _ *Extended Range Imaging Technology* - a new file format used in Kodak professional digital cameras. This proprietary technology offers an innovative image file format similar to a JPEG, but with the dynamic range and color gamut information of raw DCR camera files. Extended Range Imaging Technology files allow you to easily open, edit, and print JPEG files within your JPEG workflow. JPEG files are captured directly in the camera. With ERI, you'll have the extensive editing, color balance, and color compensation capabilities of RAW digital negatives for applying to your JPEG files.

Error Concealment _ The ability to hide transmission errors that corrupt the content beyond the ability of the receiver to properly display it. Techniques for video include replacing the corrupt region with either earlier video data, interpolated video data from previous and next frames, or interpolated data from neighboring areas within the current frame. Decoded MPEG video may also be processed using deblocking filters to reduce blocking artifacts. Techniques for audio include replacing the corrupt region with interpolated audio data.

Error Correction _ a) In digital video recording systems, a scheme that adds overhead to the data to permit a certain level of errors to be detected and corrected. _ **b)** a procedure found in digital audio systems that detects and corrects inaccurate or missing bits in the data stream. _ **c)** Checking for errors in data transmission. A calculation is made on the data being sent and the results are sent along with it. The receiver then performs the same calculation and compares its results with those sent. If an error is detected the affected data can be deleted and retransmitted, the error can be corrected or concealed, or it can simply be reported.

Error Log _ A record that contains error information.

Error Rate _ The number of errors of a given type that occur when reading a specified number of bits.

Error Resilience _ The ability to handle transmission errors without corrupting the content beyond the ability of the receiver to properly display it. MPEG-4 supports error resilience through the use of resynchronization markers, extended header code, data partitioning, and reversible VLCs.

ES _ *Elementary Stream*. A generic term for one of the coded video, coded audio, and other coded bit data in PES packets.

Essence _ The actual program (audio, video and/or data) without metadata.

Ethernet _ An inexpensive, widely used local area network developed by Xerox, DEC and Intel Corp. for data transmission between interconnected computers. Ideally, it transmits data at 10 million bits per second (about a megabyte per second). Ethernet can be used with nearly every type of computer on the market today. To connect up to an Ethernet, your PC must have a suitable Ethernet Expansion Card fitted.

ETSI _ The ***European Telecommunications Standards Institute*** - Its mission is to produce lasting telecommunications standards for Europe and beyond. ETSI has 730 members from 51 countries inside and outside Europe, and represents administrations, network operators, manufacturers, service providers, research bodies and users.

ETSI Compression _ A compression technique, based on DCT. Unlike MPEG, which is asymmetrical having complex coders and simpler decoders and is designed for broadcast, this is symmetrical with the same processing power at the coder and decoder. It is designed for applications where there are only a few recipients, such as contribution links and feeds to cable head ends. ETSI compression is intraframe, simpler than MPEG and imposes less delay in the signal path, typically 120 ms against around a second, enabling interviews to be conducted over satellite links without unwarranted delays. Data rate is 34 Mb/s.

Euphonic Pleasing _ As a descriptive audio term, usually refers to a coloration or inaccuracy that nonetheless may be sonically pleasing.

Eurovision _ The EBU TV network which links all of its members.

EV _ *Exposure Value* - a very complex thing but in the digicam world it usually means the ability to override the auto exposure system to lighten or darken an image.

EVC _ *Enhanced video connector -* A VESA standard, 35-pin video graphics card connector that can carry signals for video, audio, IEEE 1394 (FireWire) and USB (universal serial bus). This allows the computer monitor to act as a central connection hub.

EVD _ *Enhanced Versatile Disc* - The Enhanced Versatile Disc (EVD) was announced on November 18 2003 by China's news agency Xinhua as a response to the popular DVD and its high licence costs. Like DVD, it is an optical storage medium in CD size (120 mm). China started development on it in 1999, because DVD and MPEG-2 licence costs are relatively high at over $13 USD per video player. On the EVD, the codecs VP5 and VP6 from On2 Technologies are being used. These are more efficient than MPEG-2 and enable the disk to store HDTV resolutions, a feature the DVD cannot offer. With EVD, royalties to On2 for the VP6 codec will be about $2 USD. The audio codec comes from Coding Technologies, the EAC (Enhanced Audio Codec) 2.0. It is the successor of EAC and works on the basis of spectral band replication and supports mono, stereo and 5.1 surround sound. The development is supported by the Chinese government and is developed by the Beijing company E-world Technology, which has reported the overcoming of development, chip-design and production problems. The team has applied for 25 patents, of which seven have currently been granted.

Event _ a) An action initiated either by the user or the computer. An example of a user event is any mouse movement or a keystroke. An example of an internally generated event is a notification based on the time of day. _ **b)** In MIDI terms, an event is a single unit of MIDI data, such as a note being turned on or off, a piece of controller information, a program change, and so on.

Evolware _ *Evolvable hardware* - A future computing architecture that can modify its own circuitry to improve performance for solving the problems it is given. As far fetched as it sounds, self modification of hardware is already possible. For example, FPGAs are a type of logic chip that can be reprogrammed in place. Exactly how that would be done is based on some pretty complicated software.

Exabyte (EB) _ A measurement of data storage capacity on a computer. 1024 Petabytes.

Exciter _ An enhancer that works by synthesizing new high frequency harmonics.

exe file _ This is a program file, also known as an executable file which usually makes something happen!

EXIF _ *Exchangeable Image File format* refers to the embedded camera and exposure information that a digital camera puts in the header of the JPG files it creates. Many graphic programs can read and display this information.

Exif Print _ A new storage, compression file format used to store images on flash memory cards and digital cameras. Exif file contain either JPEG compressed files or uncompressed TIFF files, and can contain addition header information. Under Exif 2.2, the digital still camera can record data tags for specific camera settings and functions such as whether the flash was on or off, if the camera was in landscape, portrait or night scene mode, etc. Referencing some or all of this information, an Exif Print compatible application can process digital camera images intelligently based on specific camera settings and the shooting environment.

Expanded Memory _ A part of the computer's memory reserved for special use by software and add-on boards that need to use more than 640 kilobytes of memory. Only seen these days on the older systems running old software applications.

Expander _ An expander is another form of automatic level control. By attenuating the signal below the threshold, the expander reduces low-level noise or expands the dynamic range of the recorded material.

Expansion slot _ Electrical connection slot mounted on a computer's motherboard (main circuit board). It allows several peripheral devices to be connected inside a computer. E.g. - a modem card, soundcard or graphics card.

Expert System _ An AI application that uses a knowledge base of human expertise for problem solving. Its success is based on the quality of the data and rules obtained from the human expert. In practice, expert systems perform both below and above that of a human. It derives its answers by running the knowledge base through an inference engine, which is software that interacts with the user and processes the results from the rules and data in the knowledge base. Examples of uses are medical diagnosis, equipment repair, investment analysis, financial, estate and insurance planning, vehicle routing, contract bidding, production control and training.

Expireware _ Software with a built-in expiration date, either by date or number of uses.

Export _ a) The process of transporting data from one computer, program, type of file format, or device to another. **_ b)** The act of sending a file out through a specialized mini-application or plug-in so as to print or compress it. **_ c)** The term is also used to describe the action of saving the data to a specialized file format, i.e. JPEG, or GIF.

Exposure Bracketing _ when a digital camera automatically takes a series of 3 or 5 pictures and slightly varies the EV for each frame. This insures that at least one of the pictures will be as close to perfectly exposed as possible.

Extended Memory _ Memory above the first MB or RAM, used by system memory managers such as hymem.sys. This allows programs to make use of available memory beyond the 640 kilobytes range.

Extended Partition _ You can create multiple Partitions on a hard drive, one Primary Partition and one or more extended partition(s). Operating System files must reside on the primary partition. An extended partition is a partition where non-system files (files other than DOS or operating system files) can be stored on a disk. You can also create Logical Drives on the extended partition.

Extended Studio PAL _ A 625-line video standard that allows processing of component video quality digital signals by composite PAL equipment. The signal can be distributed and recorded in a composite digital form using D2 or D3 VTRs.

Extension _ How extended a range of frequencies the device can reproduce accurately. Bass extension refers to how low a frequency tone will the system reproduce, high-frequency extension refers to how high in frequency will the system play.

Extranet _ A Web site for customers rather than the general public. It can provide access to research, current inventories and internal databases, virtually any information that is private and not published for everyone. An extranet uses the public Internet as its transmission system, but requires passwords to gain entrance. Access to the site may be free or require payment for some or all of the services offered.

Extrusion _ Extending a 2D object into 3D space by adding a z plane.

Eye Candy _ a) Images and animated graphics added to Web sites and interactive software that makes the information exciting. In other words, glitz, sizzle and pizzazz. Video games that contain eye candy are often devoid of other redeeming qualities, like gameplay, storyline, or fun. Eye candy distracts gamers from other features that should be present in the game, such as playability or good controls. **_ b)** A slang term used in the gaming community to describe visually extraordinary graphics in a game. Games that contain eye candy are often devoid of other redeeming qualities, like gameplay, storyline, or fun. Eye candy distracts gamers from other features that should be present in the game, such as playability or good controls.

Eye Control _ This feature, used in some consumer camcorders, allows you to start, stop, focus on a subject, even fade out or fade into a scene - all without touching a button. In other words, whatever you are looking at the camera will focus on. It follows your eye movements, just like the displays on the latest jet fighter planes!

Eyedropper _ A cursor symbol that appears when a color box is clicked. It is used to choose new colors from anywhere on the screen.

EZ-D _ a new DVD-Video-compatible optical disc fully compatible with DVD-Video specs, but differ from traditional DVD-Video discs because their dye is made in such way that once opened from airtight container, discs will turn into black within 48hrs and become unreadable by DVD players. Thus, discs are being called as disposable DVDs.

EZ-Drive _ A software utility that quickly and easily partitions and formats a new hard drive. If needed, added code is installed in the boot sector of a hard drive if EZ-Drive determines that its system BIOS does not support its full capacity.

Fabless _ A semiconductor manufacturer who does not have an in-house wafer processing capability

Fabrication _ Often abbreviated to fab, the IC production/manufacturing process that takes raw wafers through a series of diffusion, etching, photolithography, and other steps to become finished wafers

Face _ A face is a collection of 3 or more verteces tied together to form a small triangle surface. Most 3D programs use 3 sided faces, but some support 4 sided ones too. A collection of faces is referred to as a mesh. Each face also has a special entity tied to it called a normal. The normal defines which side of the face is considered to be the inside of an object, and which is the outside. Faces are very often referred to as polygons.

Face Recognition _ The ability to recognize people by their facial characteristics. The most advanced technology is based on the Eigenface algorithm, which maps the characteristics of a person's face into a multidimensional face space. Computers can conduct facial database searches and/or perform live, one-to-one or one-to-many verifications with unprecedented accuracy and split-second processing. Users can be granted secure access to their computer, mobile devices, or for online e-commerce, simply by looking into their Web camera. The computer can distinguish the same person with different appearances; for example, with or without glasses, change of hair style and seasonal skin color changes. Neural networks were used for earlier face recognition systems, but with Eigenface, the computer cannot be easily fooled by photographs or by someone else with a similar appearance.

Fade _ A transition commonly used to signify the end of a scene, in which an image or sound smoothly fades to a black screen or silence (also called a fade-out transition). Similarly, you could start a new scene with a fade up from black (or fade-in) transition.

Fader _ Slider control of electronic devices such as audiomixers, amplifiers and recorders by means of which the amplitude of a signal can be invariably changed. This traditional user element is often displayed in graphical software interfaces.

FAQ _ *Frequently Asked Question* - FAQ's and their answers (usually in text form) covering all sorts of topics can be found right across the WWW. The user can search for a question then look up the possible solution that somebody else has already tried, tested and found to work.

Far End _ In video conferencing, the party or group you are connecting to at the distant site.

Farad _ Unit of measurement for capacitance. More commonly - microfarads (1/1000 farad).

Fast SCSI _ 10 Mbps (max.)

Fast Spin Down (FSD) _ During spin down, FSD brings the disk to a stop 35 percent faster to reduce sliding distance of the read/write heads in the Landing Zone.

Fast-start Streaming _ Term used in Apple's QuickTime architecture for *progressive download*.

FAT _ *File Allocation Table* - A data table stored at the beginning of each partition on the disk that is used by the operating system to determine which sectors are allocated to each file and in what order.

Favorites _ This is a folder that contains a list of web sites. It saves you the bother of having to retype complicated internet addresses every time you want to revisit the web address. You can add, arrange, rename or delete web addresses from your favorites folder any time you wish.

FCC _ *Federal Communications Commission* - The US governmental agency that controls and makes all policy for the use of broadcast airwaves.

FDD _ *Floppy disk drive* - the most common being a 1.44MB 3-1/2" drive like those used in today's PC computers.

FDDI _ *Fibre Distributed Data Interface* Standards for a 100 Mbps local area network, based upon Fiber optic or wired media configured as dual counter rotating token rings.

Feather _ The graduated area along the edge of a selection of a picture, giving the area a soft edge.

Feathering _ The process of merging borders, or softening the edge around a mask.

FED _ *Field emission display*.

Feeware _ Commercial software that is sold.

Fetch _ The process of retrieving data.

Fibre Bundle _ A group of parallel optical Fibres contained within a common jacket. A bundle may contain from just a few to several hundred Fibres.

Fibre Channel _ **a)** Fibre Channel was developed as a serial interface specifically designed for transmitting extremely large quantities of data _ **b)** An integrated set of standards designed to improve data speeds between workstations, supercomputers, storage devices and displays while providing one standard for networking storage and data transfer.

Fibre Optic _ An optical system that uses glass or transparent plastic Fibres as light-transmitting media, designed to transmit digital signals in the form of pulses of light. Fibre optic cable is noted for its properties of isolation from radio frequency and electromagnetic interference, as well as resistance to electrostatic contamination.

Fibre Optical Connector _ A device that transmits signals through light instead of conventional wire. Advantages include higher speed and the ability

Field _ **a)** An interlaced display is made using two fields, each one containing half of the scan lines needed to make up one frame of video. Each field is displayed in its entirety - therefore, the odd field is displayed, then the even, then the odd, and so on. Fields only exist for interlaced scanning systems. In the NTSC system, two consecutive fields of 262.5 lines each create a frame of 525 scan lines. In the PAL system, two consecutive fields of 312.5 lines each create a frame of 625 scan lines. _ **b)** Several well known Search Engines allow you to specify a "Field" when conducting a search enquiry. It could be that you want to specify a date, a certain domain, or a specific area of interest. They will then proceed to look through their records for the information that you require using the Fields that you have selected as a guideline in their search.

Field Dominance _ When a CAV laserdisc is placed in the still frame mode, it continuously plays back two adjacent fields of information. There are no rules in the NTSC system stating that a complete video picture has to start

on field 1 or field 2. Most of the video in this program is field 1 dominant, the picture starts on field 1. There are two sections of the disc that are field 2 dominant. In the case of film translated to video, the start of a complete film picture changes from field 1 to field 2 about 6 times a second. There is a code in the vertical interval of the disc that tells the player on which field it can start displaying each of disc's still frames.

Field Emission Displays (FED) _ An FED has many similarities with a conventional CRT display. Instead of just one "gun" spraying electrons against the inside of the screens face, there are as many as 500 million of them. Because there are now many electron guns, this means that the physical size of the display is greatly reduced. Removing the previous constraints of size and weight for large screen CRT displays.

Field Rendering _ A rendering technique that splits each frame into a single field when rendering to video.

Field Sequence _ A television frame or picture which uses interlaced scanning, comprises two fields. Each successive frame of component video repeats a complete pattern of two fields and so can be edited to frame boundaries - like film editing. Composite video, coded as PAL, NTSC or SECAM, carries color information on a subcarrier whose cyclic pattern repeats over a longer period - 4 frames in PAL and 2 frames in NTSC or SECAM - known respectively as the 8 and the 4-field sequence. An edit should not break the sequence, so dictating a less precise operation than with component video (where there is no subcarrier). The same restrictions apply whether the signals are analogue or digital. Component digital signals can be edited on any frame boundaries while composite digital systems, (e.g. with D2 or D3 VTRs) are restricted to 4 or 8-field boundaries, otherwise picture hopping or quality changes (through additional processing) will occur. This is of course an obstacle for creativity and results in the fact that no editors in the professional, creative sector use composite signal editing any longer. In a similar way, editing restrictions occur where video is inter-frame compressed - as in MPEG-2.

Fifth-generation Computer _ A computer designed for AI applications. Such systems are expected to be the next technology leap in the 21st century.

Fighting _ A fighting game is a title in which two characters square off, each commanding an arsenal of physical attacks and special moves. Fighting games involve a time limit, an energy bar for each character, and a sometimes overwhelming number of fighting moves, usually accomplished by some secret joystick gyration. Well-designed fighting games allow attacks to not only be blocked, but also parried or countered, and skillful players will learn how to string multiple attacks together in an unstoppable combination. Popular examples of fighting games are the *Street Fighter* and *Mortal Kombat* series, and the recent *Soul Calibur*, on the Dreamcast.

File _ A collection of bytes stored as an individual entity. All data on disk is stored as a file with an assigned file name that is unique within the folder (directory) it resides in. To the computer, a file is nothing more than a string of bytes. The structure of a file is known to the software that manipulates it. For example, database files are made up of a series of records. Word processing files contain a continuous flow of text. Except for ASCII text files, which contain only raw text, other files have proprietary structures. Formatting and other types of information are contained in headers or interspersed throughout the file. Following are the major file types: data file (table) - data records; document - text; spreadsheet - rows and columns of cells; image - rows and columns of bits; drawing - list of vectors; audio - digitized sound waves; MIDI - MIDI instructions; video - digital video frames; Web page - text; batch file - text; source program - text; executable program - machine language.

File Extension _ In the Windows domain, the last characters in a file name, those that comes after the dot in the name, i.e. "AVI".

File Format _ A type of program or data file.

File Server _ **a)** A computer that serves as the storage component of a local area network and permits users to share its hard disks, storage space, files, etc. _ **b)** A program running on a network that stores files and provides access to them. Web sites are uploaded as files to a File Server and thereafter the Web Designer has (password) access to them to update them as and when required. Everyone else has access to view them by typing the web address into their web browser when online.

File Size _ The file size of an image is proportional to its resolution. The higher the resolution, the bigger the file size. File size is different from image size.

File System _ A data structure that translates the physical (sector) view of a CD into a logical (files, directories) structure, which helps both computers and users locate files. In other words, it records where files and directories are located on the CD.

File Transfer _ A discontinuous transfer process which treats each transferred item as a single block, neither divisible into smaller, independent elements nor part of a larger whole. As the transfer process has a recognizable beginning and end (unlike streaming) it is possible for the complete transfer to be checked and any errors corrected. This is not possible with a streaming process. File transfer has the disadvantage that the material to be transferred has to be complete and clearly identifiable. When handling time-based material such as video and audio, as against stills, this has the disadvantage that the complete file has to be available before transfer can start. If the whole clip is a single file, this cannot be transferred until complete. However, if the clip is sub-divided, for example into frames, the transfer can start immediately after the first frame is completed.

Fill Factor _ The ratio of the light sensitive area to the pixels total size.

Fill Tool _ To be found in most Image Editing Programs, the Fill Tool is the one that automatically fills in your selected area with the chosen color or texture. Also referred to as the Fill Bucket or Flood Fill Tool.

Film Recorder _ A device that is used to record a digital image onto photosensitive film.

Filter _ In general, a filter accepts the desired and rejects the undesired. Every filter has a specific purpose. _ **a)** In electronics, for example, if you have some high frequency noise mixed with the signal that you want, then a lowpass filter is used to pass the signal and reject the (high frequency) noise. _ **b)** A specialized mini-application to extend or offer unique expansions of a software package, usually through the use of plug-in architecture. This is a key component of many imaging and digital video software packages. _ **c)** An optical attachment placed on the front of the lens. It is used to correct color, or enhance an image by absorbing part(s) of the visible light spectrum, or create special effects through prisms and other optical enhancements.

Filtering _ A process used in both analog and digital image processing to reduce bandwidth. Filters can be designed to remove information content such as low frequencies.

Final Cut _ **a)** The final video production, assembled from high-quality clips, and ready for export to the selected delivery media. _ **b)** Also, renowned NLE software for Mac platform, manufactured by Apple.

Firewall _ A system used to secure a company's or organization's internal network from unauthorized external access by hackers.

Firewire _ There are firewire cards, cables, and devices which are generically referred as Firewire. Firewire is actually a protocol for storing data, much like USB or SCSI, with high transfer speeds. These high transfer speeds make it an ideal fit for video-file transfer. Introduced by Apple Inc. in 1987, offering transfer rates of 400 Mbps. Its scaleable architecture and flexible peer-to-peer topology make it ideal for connecting devices from computers and hard drives to digital video and audio equipment with real-time processing requirements. Firewire was originally used as a replacement for the SCSI bus to transfer data between mainframes without reformatting. There is increasing interest from broadcasters to use Firewire to transport A/V data, such as MPEG-2. There are TWO different types of Firewire. One is called "4-pin" and the other is called "6-pin." The two are compatible, but you may need adapters to connect them. For example, most DV camcorders have 4-pin Firewire connectors and most computers have 6-pin Firewire connections. Also known as IEEE- 1394, "iLink" or DV.

Firmware _ An often-used micro program or instruction set stored in ROM. Usually refers to the ROM-based software that controls a unit. Firmware is found in all computer based products from Cameras to Digital Peripherals.

First-generation Computer _ A computer that used vacuum tubes as switching elements; for example, the UNIVAC I.

First-person Shooter _ The genre was originated by id Software's PC game Wolfenstein 3D in the early "90s. A first-person shooter (FPS) is, as the name implies, viewed from your character's perspective. The character's hands and weapon of choice are always displayed in the foreground" Some first-person shooters have successfully integrated complex storylines and adventure like elements. Many let multiple individuals compete in frag fests that have come to be known as "deathmatches." First-person shooters are a traditionally PC-centric genre, and the majority that exist on consoles are PC ports. In the last few years, many original first-person shooters have begun to appear on consoles, such as Medal of Honor on the PlayStation and the upcoming Maken X for the Dreamcast.

FITS _ *Functional Interpolating Transformation System* - A format that contains that contains all data used to design and assemble extremely large files in a small, efficient mathematical structure.

Fixed Data Rate Compression _ Techniques designed to produce a data stream with a constant data rate. Such techniques may vary the quality of quantization to match the allocated bandwidth.

Fixed-Pattern Noise (FTP) _ The unvarying display noise present in CCDs and CMOS sensors.

Fixed-Point Processor _ is used in multiple calculations with a limited dynamic range.

Flame _ An insulting or derogatory message usually sent via E-mail as punishment for a breach of what's known as Netiquette.

Flame Wars _ These are started when other people on the sidelines join into a heated Flame Exchange and express their views.

Flange _ an effect applied to a sound where a delayed version of the sound (feedback) is mixed with the original to create a dramatic, sweeping sound.

Flare _ The soft effect visible in a picture resulting from stray light which passes through the lens but is not focused to form the primary image. Flare can be controlled by using a lens hood.

Flash _ Macromedia Flash is a popular architecture for vector-based Web animation. Often referred to as "streaming," Flash does not fit the definition of "true streaming". While Flash shares some characteristics with *streaming media,* and can simulate video by animating sequential frames, it does not deliver standard, full-motion video file formats over the Web and is constrained to files containing no more than 16,000 frames (approximately 17 minutes of material at 15 fps).

Flash Card _ A small module that contains flash memory such as a PC Card, Compact-Flash, SmartMedia or similar format.

Flash Card Adapter _ A device that enables flash memory cards to be read without specialized drives. PC Card adapters for all the major flash media are widely available for laptops, and floppy-based adapters are used for desktop machines that do not have PC Card readers.

Flash Disk _ A solid state disk made of flash memory chips. Flash disks are housed in Type II PC Cards for laptops, but handhelds and digital cameras use smaller flash memory cards such as CompactFlash and SmartMedia.

Flash Memory _ A memory chip that can be rewritten and hold its content without power. It is also called a "flash RAM" or "flash ROM" chip and is widely used for digital camera film and as storage for many consumer and industrial applications. Flash chips replaced earlier ROM BIOS chips in a PC so that the BIOS could be updated in place instead of being replaced. Flash chips generally have life spans from 100K to 300K write cycles. Unlike DRAM and SRAM memory chips, in which a single byte can be written, flash memory must be erased and written in fixed blocks, typically ranging from 512 bytes up to 256KB. Evolving out of the EEPROM chip technology, which can be erased in place, flash memory is less expensive and more dense. The term was coined by Toshiba for its ability to be erased "in a flash." Flash memory chips are conveniently packaged as "flash cards" and come in several formats, including the full-size PC Card (ATA PC Card) and the smaller CompactFlash, SmartMedia and similar formats. There are two types of flash interfaces. The first is the ATA interface, which has the same 512-byte block size as the standard hard disk sector. The second is the earlier linear flash, which is also used to execute a program directly from the chip (XIP). It requires Flash Translation Layer (FTL) or Flash File System (FFS) software to make it look like a disk drive

Flash Pix _ This file format (***.FPX**) is a cooperative venture between Kodak, Microsoft and Hewlett-Packard that can contain more than one physical resolution with out fixed dimensions. The resolution loaded will control the size of the resulting bitmap. JPEG is used as the compression engine, and the resulting file is about 30% larger than single resolution file.

Flat File _ A data file that is not related to or does not contain any linkages to another file. It is generally used for stand-alone lists. When files must be related (customers to orders, vendors to purchases, etc.), a relational database manager is used, not a flat file manager. Flat files can be related, but only if the applications are programmed to do so. Years ago, flat files were the very type used in a relational database. Before relational databases, files were related with built-in pointers that could not be dynamically changed. The relational database eliminated the hardwired linkages, resulting in "flat files." Today, flat files do not relate; just the opposite. Another example of how the terminology in this industry can drive you nuts.

Flat Screen Display _ Television screens that flatten the size of television sets to that of a framed picture. The screens on common television sets use bulky cathode ray tubes (CRTs). CRTs are made of a glass envelope and use a controlled beam of electrons striking light-emitting material to display the picture. Flat screen displays use plasma display systems that does not require the use of CRTs and other bulky tube equipment.

Flat Shading _ The flat shading method is also called constant shading. For rendering, it assigns a uniform color throughout an entire polygon. This shading results in the lowest quality, an object surface with a faceted appearance and a visible underlying geometry that looks "blocky". No textures are applied in this mode.

Flatbed Scanner _ An optical scanner in which the original image remains stationary while the sensors (usually a CCD linear array) passes over or under it. The scanned material is held flat and scanned using a reflective process.

Flatten _ To combine all visible layers into a single layer.

Flatten Layers _ To bring all levels of a multi-layered image down to one plane. High-end graphics programs provide a native file format that supports multiple layers. It enables image elements to be placed into different layers so they can be moved independently of each other. In order to save the layered image in a common format such as TIFF, BMP or GIF, which support only one layer, the image is said to be "flattened."

FLC file _ An animation file format from Autodesk, that is commonly known as a "flick" file. It uses the .FLC file extension and provides a 640x480 resolution. An earlier .FLI format provides 320x200 resolution. Both FLC and FLI files provide animated sequences, but not sound.

Fletcher-Munson Curve _ Our sensitivity to sound depends on its frequency and volume. Human ears are most sensitive to sounds in the midrange. At lower volume levels humans are less sensitive to sounds away from the midrange, bass and treble sounds seem reduced in intensity at lower listening levels

Flicker _ Flicker occurs when the **frame rate** of the video is too low. It's the same effect produced by an old fluorescent light fixture. The two problems with flicker are that it's distracting and tiring to the eyes.

Flippers _ Slang term for a DVD on which a film is split on two sides. Some longer films released on early DVDs are flippers, but the advent of better compression technology and RSDL discs eliminated the need for these.

Floating Point _ A method for storing and calculating numbers in which the decimal points do not line up as in fixed point numbers. The significant digits are stored as a unit called the "mantissa," and the location of the radix point (decimal point in base 10) is stored in a separate unit called the "exponent." Floating point methods are used for calculating a large range of numbers quickly. Floating point operations can be implemented in hardware (math coprocessor), or they can be done in software. In large systems, they can also be performed in a separate floating point processor that is connected to the main processor via a channel

Floating Selection _ A moveable selection that is active and above a layer.

Floating-Point Operations Per Second (FLOPS) _ is a measurement of performance of capability assigned to a floating-point processor. It is usually noted as MFLOPS or Million FLOPS.

Floating-Point Processor _ is used in multiple calculations to obtain high precision with an unlimited dynamic range.

Floppy Disk _ Typically, a removable computer storage medium consisting of a thin flexible plastic disk, coated with a magnetic material on both sides. The most common type, a 3.5- inch, is protected by a hard plastic case.

Floppy Disk Adapter _ A device that resembles a 3-1/2" floppy diskette and allows a SmartMedia cards or Sony Memory Stick modules to be read in a standard 1.44MB floppy disk drive.

Floppy Disk Drive _ All modern computers have one and it's usually referred to as "A" Drive. The specifications for a Floppy Disk used in it are 3.5in HD (high density) and 1.44 MB (capacity).

FLOPS _ Floating Point Operations Per Second. A slightly more meaningful measure of processor speed than MIPS. Computers essentially work with integer numbers. Decimal values are harder to process, particularly if the figures after the decimal point are not fixed. The variable position of the point makes memory management more difficult. FLOPS thus represent to some extent useful work.

Floptical _ A 21 MB data PC floppy drive.

Flutter Echo _ Resonant echo that occurs when sound reflects back and forth between two parallel, reflective surfaces.

Flyback _ The period during scanning when the electron beam returns rapidly to the beginning of the next line.

Flying Erase Head _ An erase head which is incorporated in the rotating drum of a recorder. Essential for perfect electronic editing.

Flying Spot Scanner _ A scanner in which the original is held inside a dark chamber while a beam of light flies across it in a raster pattern.

FM _ *Frequency Modulation* - A method of combining an information signal with a carrier signal so that it may be transmitted. FM uses the information signal to add to and subtract from a carrier frequency, thus "modulating" the carrier frequency. Example_ audio frequency is "modulated" onto a radio frequency (RF) and transmitted. An FM radio receives the transmitted signal and removes (demodulates) the RF, producing a copy of the original audio.

FM Synthesis _ A MIDI technique that simulates the sound of musical instruments. It uses operators, typically four of them, which create wave forms or modulate the wave forms. FM synthesis does not create sound as faithfully as wave table synthesis, which uses actual samples of the instruments.

FMV _ *Full motion video* - While the cartridge format's limited storage capacity left no room for video, the advent of CD-based video game systems gave developers virtually endless room to play with. The first and most overused way that games used this space was with full motion video. In fact, some of the first CD games were barely more than poor-quality video files strung together in the name of interactivity. FMV still tends to be gratuitous these days; however, games like Final Fantasy actually use it to a great dramatic effect, and in many cases, it does advance the story and make a game seem more cohesive.

Focal Length _ The distance between the optical centre of a lens and the surface of the CCD tube or film emulsion when the lens is set at infinity.

Focal Point _ A point on the optical axis where a bundle of rays forms a sharp image of an object. With an "ideal" lens, the light rays diverge from a subject point parallel to the optical axis and converge to a point when they pass through the lens. This point of convergence is called the focal point.

Fogging _ In computer graphics, simulating the effects of fog, smoke and haze. Similar to alpha blending, fogging is very computational. If the operation is performed in the graphics accelerator, the results are displayed considerably faster.

Foldback _ System for feeding one or more separate mixes to the performers for use while recording and overdubbing. Also known as a cue mix.

Folder _ Similar to its paper equivalent, it's a place where files are stored on the computers hard drive. With Mac OS and Windows, folders are visual representations of directories in which a group of files can be stored for user convenience or other purposes. Folders are normally shown as paper folder icons and files can be moved inside a folder by dragging the file's icon on to the folder icon. Files inside a folder can be viewed by opening the folder. Since folders are visual representations of directories, users can arrange them in hierarchical order by placing one folder inside another.

Foley _ The art of recreating incidental sound effects, such as footsteps or rustling clothes, in sync with the picture. Named after one of its first practitioners.

Font _ A specific style and size of printed or displayed character sets.

Foofer Valve _ A highly technical description of an electrical part that is unknown (i.e. - It has blown a Foofer Valve).

Footpad _ A large pad with pressure sensors for the arrow buttons and action buttons. It's designed to be laid on the floor and stepped on appropriately, meaning in synch with the game's commands. Nintendo used this idea years ago as the PowerPad to sell NES systems, and recently this kind of pad has made a comeback for use with Konami's Dance Revolution.

Force Feedback _ Motion generated from inside a control device by motors that correspond to onscreen events. Force feedback originated in arcades and with PC games but has found its way to console games beginning with Nintendo's Rumble Pak. Sony has recently made force feedback a standard by packing its Dual Shock force feedback controller with the PlayStation console.

Foreground/background _ The priority assigned to programs running in a multitasking environment. In a multi-user environment, foreground programs have highest priority, and background programs have lowest. Online users are given the foreground, and batch processing activities (sorts, updates, etc.) are given the background. If batch activities are given a higher priority, terminal response times may slow down considerably. In a personal computer, the foreground program is the one the user is currently working with, and the background program might be a print spooler or communications program.

Form Factor _ The industry standard that defines the physical and external dimensions of a particular device.

Formant _ Frequency component or resonance of an instrument or voice sound that doesn't change with the pitch of the note being played or sung. For example, the body resonance of an acoustic guitar remains constant, regardless of the note being played.

Format _ a) A computer operating arrangement of data words, letters, characters, files, etc. In transferring files, the sender should use a file format which the receiving program can read. _ **b)** The term used for erasing the entire contents of a hard disk or floppy disk, ready for copying programs to it. _ **c)** The various standards used to broadcast DTV. Currently, there are several formats used to broadcast both standard and high definition programs. You may hear terms like 480i, 720i and 1080i. These are digital formats.

Format Conversion _ Process of both encoding/decoding and re-sampling digital rates to change digital data from one format to another.

Formatted Capacity _ The actual capacity available to store data in a mass storage device. The formatted capacity is the gross capacity minus the capacity taken up by the overhead data required for formatting the media.

Forum _ An information interchange regarding a specific topic or product that is hosted on an Internet newsgroup, online service or BBS. It can include the latest news on the subject, a conferencing capability for questions and answers by participants as well as files for downloading fixes, demos and other related material.

FOURCC _ This is a four letter string uniquely identifying the datastream format used in an AVI file.

Four-point Editing _ An editing feature used for replacing footage in a program when the precise In and Out points of the clip to be inserted and the portion of the program to be replaced are critical and are, therefore specified by the editor. The four-point editing feature alerts the editor to any discrepancy in the two clips and automatically suggests alternatives.

Fourth-generation Computer _ A computer made up almost entirely of chips with limited amounts of discrete components. We are currently in the fourth generation.

FPGA _ *Field Programmable Gate Array* An IC incorporating an array of programmable logic gates that are not pre-connected but where the connections are programmed electrically by the user. Containing up to hundreds of thousands of gates, there are a variety of architectures. Some are very sophisticated, including not only programmable logic blocks, but programmable interconnects and switches between the blocks. FPGAs are mostly reprogrammable (EEPROM or flash based) or dynamic (RAM based).

FPS _ *Frames Per Second* - Abbreviation for frames per second; the standard for measuring the rate of video playback speed. A rate of 30 or 25 fps is considered real-time speed and a rate of 24 fps is considered animation speed. At 12-15 fps, the human eye can detect individual frames causing video to appear jerky. A method for describing *frame rate.*

FPU _ *Floating Point Unit* - A high-speed mathematics coprocessor for a microprocessor.

Fractals _ A lossy compression method used for color images. Providing ratios of 100:1 or greater, fractals are especially suited to natural objects, such as trees, clouds and rivers. Fractals turn an image into a set of data and an algorithm for expanding it back to the original. The term comes from "fractus," which is Latin for broken or fragmented. It was coined by IBM Fellow and doctor of mathematics Benoit Mandelbrot, who expanded on ideas from earlier mathematicians and discovered similarities in chaotic and random events and shapes.

Fractual Compression _ A technique for compressing images that uses fractals. It can produce high quality and high compression ratios. The drawback to fractal compression is that it is computational expensive, so therefore takes a long time.

Frag _ A kill in a deathmatch computer game. Like the term deathmatch, the term frag originated in the PC game Doom but has since become a slang term that can apply to a kill in any multiplayer first-person shooter.

Fragment _ The process by which the available space on a disk drive gets split up into small sections due to the storing and erasing of files.

Fragmentation _ Changing, partial deletion or completion of existing data on a hard disk leads to increased hard disk fragmentation. The created gaps between the sectors are written on over and over again. Linked clips or files are subdivided into individual parts on the hard disk and recorded across numerous, incoherent disk sectors. The read head of the hard disk has to be repositioned during reading of a clip, thus constantly crossing the complete disk radius in the worst case. This takes time, leads to reduced disk velocity and to interrupted rendition, all of which should be avoided. Certain service programs should therefore be used to regularly defragment the hard disk to optimize the reading velocity.

Frame _ A frame of video is essentially one picture or "still" out of a video stream. By playing these individual frames fast enough, it looks like people are "moving" on the screen. It's the same principle as flip cards, cartoons, and movies. In interlaced video a frame is one complete picture. A video frame is made

up of two fields, or two sets of interlaced lines. The frame rate of a progressive scan format is twice that of an interlace scan format. In film, a frame is one still picture of a series that make up a motion picture.

Frame Accurate _ being frame accurate, is the ability of an editing system to start, stop, and search for specific frames of video. Frame accurate editing requires the use of time code.

Frame Buffer _ The portion of video memory where pixel data is stored. Pixel data includes color information and may include other information such as z value. A frame buffer is typically used for screen display and is the size of the maximum image area on screen. It is a separate memory bank on the display adapter that holds the bitmapped image while it is being "painted" on screen. Sophisticated graphics systems are built with several memory planes, each holding one or more bits of the pixel.

Frame Buffer Memory _ that stores pixel data that is independent of the image buffer. This is often used for menus, window borders and other user interface images.

Frame Capture _ Using a video editing program to capture a single still frame of video from a camcorder or other source. It can also get confused with an export of a single frame of video.

Frame Grabber _ A device that enables the real-time capture of a single frame of video. The frame is captured within a temporary buffer for manipulation or conversion to specified file format. The buffers of some frame grabbers are large enough to store several complete frames, enabling the rapid capture of many images. A frame grabber differs from a digitizer in that a digitizer captures complete sequential frames, so it must use compression or acceleration or both to capture in real-time.

Frame Rate _ The frame rate of a video source is how fast a new still image is available. For example, with the NTSC system, the entire display is repainted about once every 30th of a second for a frame rate of about 30 frames per second. For PAL, the frame rate is 25 frames per second. For computer displays, the frame rate is usually 70-90 frames per second. Standard film uses 24 frames per second. Most web video uses much lower frame rates, to help limit the data

rate. This can have a large impact on motion quality.

Frame Synchronizer _ A digital buffer that, by storage, comparison of sync information to a reference, and timed release of video signals, can continuously adjust the signal for any timing errors.

Frame-based 2-D Animation _ A two-dimensional animation technique in which an object is moved from one position, size, and color to another. Many software packages use keyframes to create frame-based 2-D animation. One of the two main types of animation associated with digital video.

Frames _ a) A series of still images shown in rapid sequence to show movement. Traditionally, television images have been broadcast at a rate of 30 frames per second. **_ b)** Often used in a Web page to divide it up into sections. Sometimes you'll see an index displayed on the left-hand side of the page and then images or a drop-down menu on the right-hand side, with text in between the two. To achieve this effect a Frame will have been used. There are lots of different types available to a Web Designer.

Framestore _ The name given to solid state video storage, usually built with DRAMs. Technically it implies storage of one complete frame or picture, but the term is also used more generically to encompass the storage of a few lines to many frames.

Free-to-view _ is a general term describing any channel for which you don't have to pay extra subscriptions to watch.

Freeware _ Software allowed to be distributed free and downloaded from the Internet. There are occasionally limitations, such as the version available on the Net is probably not the latest one available in the shops (for obvious reasons) and you're unlikely to be able to modify it. Also, the version offered may have limited functionality.

Freeze _ In digital picture manipulators, the ability to stop or hold a frame of video so that the picture is frozen like a snapshot.

Freeze Frame _ The storing of a single frame of video.

Frequency _ The number times a particular event happens per a given time. In A/V, the number of complete cycles per second of a musical tone or electronic signal, expressed in Hertz (Hz). Since the video sector mainly

works high frequencies, the abbreviation MHz meaning Megahertz is very common. Frequency indications are often used in video technology for various purposes, e.g. for determining bandwidths, sampling rates and carrier frequencies.

Frequency Range _ Refers to the low-to-high limits of a device, such as a computer, projector or monitor.

Frequency Response _ A measure of a component's ability to reproduce all frequencies at their correct volumes. Frequency-response curves show whether a speaker outputs certain frequencies too loudly or softly. Excessive fluctuations in a curve indicate colorations, which can result in muddy, tinny, or boomy sound. Generally expressed in Hz vs. dB. For example: 100 - 5,000 Hz +/- 5dB means that the device can handle a frequency range of 100 to 5,000 Hz with a possible deviation in amplitude within that frequency range of +5 to -5dB.

Fringe _ The pixels along the border of a selection that contain a combination of the selection and background colors.

Fringing _ This occurs when a digital image is artificially sharpened. The term usually refers to a white fringe that is apparent on the edges of objects in the picture. Fringing can also occur as a result of compression.

Front Porch _ This is the area of the video waveform that sits between the start of horizontal blanking and the start of horizontal sync.

FTP _ *File Transfer Protocol* - is the simplest way to exchange files between computers on the Internet. Like the Hypertext Transfer Protocol (**HTTP**), which transfers displayable Web pages and related files, and the Simple Mail Transfer Protocol (SMTP), which transfers e-mail, FTP uses the Internet's TCP/IP protocols. FTP is commonly used to transfer Web page files from the on which they were created to a Web server.

Full Field _ A complete video image consisting of two fields of video per frame.

Full-Duplex _ A communication protocol that permits simultaneous transmission in both directions.

Full-Frame Imager _ A type of image sensor consisting of a single light-sensitive array of photoelements that also store the image during the sensor readout period. A CCD con-

verts the light sensed by its photodiode into electronic signals, and sends them to image memory. The CCD has a data-transfer channel for sending these signals. The widely used interline method (left picture) places this data-transfer channel between adjacent pixels. Conversely, full-frame method (right picture) provides a data-transfer channel for each pixel. The full-frame method allows each photodiode to be larger than with the interlined method, even with the same pixel interval. This provides a superb range of expression, even in dimly lit places. Full-frame CCDs also eliminate the need for a data-transfer channel separate from the photodiodes. This allows for more space to store electric charge emitted by the photodiodes than with an interline CCD, providing high fidelity, even in brightly lit places.

Full-motion Video _ Video transmission that changes the image 30 frames per second (30 fps). Motion pictures are run at 24 fps, which is the minimum frequency required to eliminate the perception of moving frames and make the images appear visually fluid to the eye. TV video generates 30 (or 25 in PAL system) interlaced frames per second, which is actually transmitted as 60 half frames per second. Video that has been digitized and stored in the computer can be displayed at varying frame rates, depending on the speed of the computer. The slower the computer, the more jerky the movement.

Full-screen Image _ A digital image that takes up the entire computer screen.

Fundamental Frequency _ The predominant frequency in a complex waveform. Typically provides the sound with its strongest pitch reference. Any sound comprises a fundamental or basic frequency plus harmonics and partials at a higher frequency.

Fuzziness _ The amount of anti-aliasing along the edges of a selection.

Fuzzy Computer _ A specially designed computer that employs fuzzy logic. Using such architectural components as analog circuits and parallel processing, fuzzy computers are designed for AI applications.

Fuzzy Logic _ A mathematical technique for dealing with imprecise data and problems that have many solutions rather than one. Although it is implemented in digital computers which ultimately make only yes-no decisions, fuzzy logic works with ranges of

values, solving problems in a way that more resembles human logic. Fuzzy logic is used for solving problems with expert systems and real-time systems that must react to an imperfect environment of highly variable, volatile or unpredictable conditions. It "smoothes the edges" so to speak, circumventing abrupt changes in operation that could result from relying on traditional either-or and all-or-nothing logic. Fuzzy logic was conceived by Lotfi Zadeh, from the University of California at Berkeley. In 1964, while contemplating how computers could be programmed for handwriting recognition, Zadeh expanded on traditional set theory by making membership in a set a matter of degree rather than a yes-no situation.

FWIW _ Digispeak for "for what it's worth."

FX _ Abbreviation for effects. It is used in various different fields, of film and TV production. In post production, the FX is commonly referred to as a general term for any kind of image manipulation such as wipes and keying effects, 3-D image manipulation, color variations etc.

FYI _ Digispeak for "for your information."

G

Gadget _ normally, a device that is very useful for a particular job. More and more, becoming a toy, not really needed for anything... Today, most gadgets are electroniclly, digitally based.

Gain _ a) A general term for an increase in signal power or voltage produced by an amplifier. The amount of gain is usually expressed in decibels above a reference level. Opposite of attenuation. **_ b)** The amplification of a signal, unit or system. Expressed in the unit of measurement appropriate to the signal or system, or in a mathematical formulation (YxZ) for screens. **_ c)** A method of adjusting a CCD sensor's sensitivity to light. **_ d)** The function of a volume control.

Gallium Arsenide (GaAs) _ is an alloy of gallium and arsenic compound used as the base material for chips. This process technology is several times faster than silicon and enables wireless transmissions that can broadcast and receive hundreds of video channels with stereo audio and data.

Game Boy _ The Nintendo Game Boy, using 8 bit processing and a monochrome LCD screen to run its cartridge games, was the first of the handhelds and is the only one to still be retailed now. This has been helped substantially by the release of the Game Boy Pocket, a 30% smaller version of the original hand-held console and the Game Boy Color, a color version of the Game Boy. Game Boy Advance, the true 32bit successor to the original Game Boy was launched in 2001.

Game Channels _ Some digital TV channels are games channels where you can play electronic games using your remote control.

Game Developer _ A company whose primary business activity is writing (developing) computer games. Developing games requires a diverse range of artistic and technical expertise including game design, music composition, graphical art/design, AI and programming (coding) ability. Some publishers have in house development teams, some use third party developers - most publishers use a mix of the two.

Game Gear _ Sega's Game Gear was a color handheld. The Game Gear achieved moderate success selling around 3m units in Europe since its launch in 1991 but is no longer manufactured.

GameCube _ Nintendo's 128bit games console launched in 2001.

Gamma _ The transfer characteristics of most cameras and displays are nonlinear. A small change in voltage when the voltage level is low produces a change in the output display brightness level; but this same small change in voltage at a high voltage level will not produce the same magnitude of change in the brightness output. This effect, or actually the difference between what you should have and what you actually measured, is known as gamma.

Gamma Correction _ Before being displayed, linear RGB data must be processed (gamma corrected) to compensate for the gamma (nonlinear characteristics) of the display.

Gamut _ a) The range of voltages allowed for a video signal, or for a video signal component. Signal voltages outside the allowable range (i.e., those that exceed the gamut) may cause distortions such as clipping. **_ b)** The range of colors that are available in an image or output process. It is generally used in describing the capabilities of a printer to reproduce colors faithfully and vibrantly

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

Garbage Collection _ A software routine that searches memory for areas of inactive data and instructions in order to reclaim that space for the general memory pool (the heap). Operating systems may or may not provide this feature. For example, Windows does not do

automatic garbage collection which requires that the programmer specifically deallocates memory in order to release it. If a program continues to allocate memory for data buffers and eventually exceeds the physical memory capacity, the operating system then has to place parts of the program in virtual memory (on disk) in order to continue, which slows down processing. Deallocating memory after a routine no longer needs it is a tedious task and programmers often forget to do it or do not do it properly. Java performs automatic garbage collection without programmer intervention, which eliminates this coding headache.

Gate _ a) A basic circuit which produces an output only when certain input conditions are satisfied. _ **b)** The aperture and mechanism that holds the film in a camera or projector during exposure or projection.

Gate Array _ An IC consisting of a regular arrangement of gates that are interconnected to provide custom functions. Sometimes called an Uncommitted Logic Array (ULA) or Sea of Gates

Gateway _ The interface between two opposing protocols. By means of software and hardware a gateway allows connections to be made between what would otherwise be incompatible networks. Today many images for use in film or TV are produced on standard computer systems so an effective connection between these and the dedicated hardware of television is required.

Gaussian Blur _ A type of image filter commonly used to blur an object. It may be used to blur the entire image or to produce a drop shadow effect.

Gaussian Brush _ A "brush" with variable density.

GB _ a) *GigaByte* (GB) One billion bytes (technically 1,073,741,824 bytes). _ **b)** *Giga-Bit* (Gb) One billion bits (technically 1,073,741,824 bits). Lower case "b" for bit and "B" for byte are not always followed and often misprinted. Thus, Gb may refer to gigabyte.

Gbps _ A measurement of data transfer capacity on a computer. Gigabits per second.

GDI _ *Graphics Device Interface* The graphics display system in Microsoft Windows. When an application needs to display

or print, it makes a call to a GDI function and sends it the parameters for the object that must be created. GDI in turn "draws" the object by sending commands to the screen and printer drivers, which actually render the images.

Geek _ A technically oriented person. It has typically implied a "nerdy" or "weird" personality, someone with limited social skills who likes to tinker with scientific or high-tech projects. By the end of the 1990s, it became quite fashionable to be a geek, since countless technical people had become very successful starting with PCs in the 1980s and during the dot-com bubble.

Geekonics _ *GEEK phonics* - Computer English, or more precisely "computer sounds," which are the acronyms and buzzwords spoken by computer people. Geekonics is the high-tech counterpart to Ebonics (ebony and phonics), which is Black English. A whole lot of Geekonics is in this database.

General MIDI _ A standard set of 128 sounds for MIDI sound cards and devices (synthesizers, sound modules, etc.). By assigning instruments to specific MIDI patch locations, General MIDI provides a standard way of communicating MIDI sound. MIDI's small storage requirement makes it very desirable as a musical sound source for multimedia applications compared to digitizing actual music. For example, a three-minute MIDI file may take only 20 to 30K, whereas a WAV file (digital audio) could consume up to several megabytes depending on sound quality.

General-purpose Computer _ Refers to computers that follow instructions, thus virtually all computers from micro to mainframe are general purpose. Even computers in toys, games and single-function devices follow instructions in their built-in program. In contrast, computational devices can be designed from scratch for special purposes

Generation _ Original recorded footage is called "first generation." A copy of the original is second-generation video. A copy of a copy is called third generation, and so forth.

Generation D _ *generation Digital* - World-Com's branding of its digital services, which includes high-speed access to the Internet. It implies an attitude and mind of those who totally enjoy and are comfortable with the advances of the high tech world.

Generation Loss _ The signal degradation caused by successive recordings. Freshly recorded material is first generation, one re-recording, or copy, makes the second generation, etc. This is of major concern in analogue linear editing but much less so using a digital suite. Non-compressed component DVTRs should provide at least twenty generations before any artifacts become noticeable but the very best multi-generation results are possible with disk-based systems. These can re-recorded millions of times without causing dropouts or errors. Generations are effectively limitless. Digital systems, however, that use compression, may also cause losses. Realization of elaborate digital tricks by making use of various effects may lead to sequencing of various compression or decompression steps. If the same picture material is compressed and decompressed over and over again, a loss in picture quality becomes visible as a result of rounding errors after a few generations. This digital recording loss is higher, the higher the compression factor. Digital duplication losses are usually of no importance in normal editing without multiple effect levels. Besides the limitations of recording, the action of processors such as decoders and coders will make a significant contribution to generation loss. The decode/recode cycle of NTSC and PAL is well known for its limitations but equal caution is needed for digital video compression systems, especially those using MPEG, and the color space conversions that typically occur between computers handling RGB and video equipment using Y, Cr, Cb.

Generation X _ Refers to individuals roughly between the age of 25 and 34. "Generation Y" pertains to ages 18 to 24, and "baby boomers" are people 35 to 54. By the time older gen-Xers became teenagers, the personal computer revolution had begun. Younger gen-Xers and all generation Ys were brought up in the thick of it. In contrast, older baby boomers were certainly raised without desktop computers, but many did not even have TVs as children.

Genlock _ A video signal provides all of the information necessary for a video decoder to reconstruct the picture. This includes brightness, color, and timing information. To properly decode the video signal, the video decoder must lock to all the timing information embedded within the video signal, including the color burst, horizontal sync, and vertical

sync. The decoder looks at the color burst of the video signal and reconstructs the original color subcarrier that was used by the encoder. This is needed to properly decode the color information. It also generates a sample clock (done by looking at the sync information within the video signal), used to clock pixel data out of the decoder into a memory or another circuit for processing. The circuitry within the decoder that does all of this work is called the genlock circuit. Although it sounds simple, the genlock circuit must be able to handle very bad video sources, such as the output of VCRs, cameras, or videodisc player. Genlock is required for mixing signals, such as when overlaying a computer graphic on an image from a video source, to prevent screen flicker or rolling. In reality, the genlock circuit is the most complex section of a video decoder.

Genre _ Most games fall conveniently into a specific type or genre of game.

GEO _ *Geostationary Earth Orbit* A communications satellite in orbit 22,282 miles above the equator. At this orbit, it travels at the same speed as the earth's rotation, thus appearing stationary. GEOs are excellent for TV broadcasting, but produce distracting, half-second delays in interactive voice conversations, because of the long round trip from earth and back. LEOs and MEOs, which are closer to the earth, are being deployed for interactive services.

Geometric Primitives _ A point, line or polygon.

Geometry _ The 3D structure of an object.

Geometry Calculations _ In 3-D graphics rendering, the computation of the base properties for each point (vertex) of the triangles forming the objects in the 3-D world. These properties include x-y-z coordinates, RGB values, alpha translucency, reflectivity and others. The geometry calculations involve transformation from 3-D world coordinates into corresponding 2-D screen coordinates, clipping off any parts not visible on screen and lighting.

Ghost/ghosting _ Also called "reflections". A shadowy or weak duplication of the original image. It can be the result of transmission conditions where secondary signals are created and then displayed earlier or later than the original signal. Ghosts can also be the result of burning an image on a screen or stray reflections from a mirror.

GHz _ *Gigahertz* - One billion cycles per second.

Gib _ A chunk of virtual flesh from a recently disintegrated enemy. The word originates from "giblets" and is used most often in multi-player games. A disparaging comment made about your opponent's gibs is considered a taunt.

GIF _ *Graphics interchange format* - A computer graphics file format developed by CompuServe for use in compressing graphic images, now commonly used on the Internet. This is a raster file format that allows Indexed Color, Grayscale, or Bitmap images to be easily transported between computer platforms. GIF compression is lossless, supports transparency, but allows a maximum of only 256 colors. Images that will gain the most from GIF compression are those which have large areas (especially horizontal area) with no changes in color.

GIF 89a _ The most recent GIF standard that allows the selection of an area for transparency. The primary use is on the Internet and other on-line services. Like GIF it is 256 color or 8 bit imaging.

Gigabit Ethernet _ Development of existing Ethernet technology to support even higher rates, i.e. 1,000 Mb/s. This is specified for both fiber and copper media.

Gigabyte _ A measure of computer memory or disk space consisting of about one thousand million bytes (a thousand megabytes). The actual value is 1,073,741,824 bytes (1024 megabytes).

GITO _ *Garbage In, Garbage Out*.

Glass Master _ Glass mastering is the process of transferring the CD master to a physical image of the pits that are on the finished CD. The glass master is a glass plate, about 10" in diameter, coated with a light-sensitive material. During glass mastering, a laser etches very tiny pits on the material. When the master tape is played, its digital signals are converted to the EFM coding format for the CD, and that signal is fed to the special laser cutter. The glass master is very delicate, and cannot be played. Succeeding steps in the process, called Father, Mother, and Stamper, result in the metal forms which are capable of hot molding thousands of compact discs on the presses.

Glitch _ Describes an unwanted short term corruption of a signal, or the unexplained short term malfunction of a piece of equipment. For example, an inexplicable click on a DAT tape would be termed a glitch.

Global Control _ The top level of control in a multi-channel DVE system. A number of objects (channels) can be controlled at one time, for example to alter their opacity or to move them all together relative to a global axis - one which may be quite separate from the objects themselves. This way the viewing point of all the assembled objects can be changed. For example a cube assembled from six channels could be moved in 3D space as a single action from a global control.

Global Work _ Editing that affects the entire picture or page.

Glue _ Refers to software that provides some conversion, translation or other process that makes one system work with another. For example, an application adapter reformats the data into a form available to another application and vice versa. A CGI script sits between the browser and the database, enabling search requests to be passed to the database. "Glue" or "glue software" are terms that can be widely used to reference small programs or scripts needed to integrate applications or tie subsystems together.

GMT-S _ Optional device on set - ultra-small, standalone 1ppm timecode generator designed to add frame accurate timecode capability to digital audio recorders, timecode slates, inserters and other less accurate timecode devices.

GNOME _ *GNU Network Object Modeling Environment* - A GUI-based user interface for Linux and other UNIX environments that grew out of the GNU project. Providing an alternative to the KDE interface, GNOME is either pronounced "guhnome" or "nome."

GOB _ *Group of Blocks*.

GOF _ *Group of Audio Frames* The data area of 1/30 second, which is composed of 20 audio frames of linear PCM audio.

Gold _ Usually used in the phrase "gone gold," gold status means a video game has been declared finished by the development team and is being sent to the publisher for testing, then to a disc-pressing factory for subsequent manufacture. Gold status sometimes precedes a game's release by as little as a week or two.

GOP _ *Group of Pictures* - The sequence of I, B and/or P-frames produced during MPEG or MPEG-2 compression. This sequence of frames contains all of the information required to reproduce a complete video segment. The longer the GOP, the less editable it is.

Gopher _ There is some similarity to what you thought it might be (i.e. a man that fetches and carries things) but an Internet Gopher is a distributed document search and retrieval system that takes a request for information and then scans the Internet for it. This means that users of desktop computers are allowed to browse, search or retrieve documents stored on multiple distribution server machines.

Gouraud Shading _ Gouraud shading, one of the most popular smooth shading algorithms, is named after its French originator, Henri Gouraud. Gouraud shading, or color interpolation, is a process by which color information is interpolated across the face of the polygon to determine the colors at each pixel. It assigns color to every pixel within each polygon based on linear interpolation from the polygon's vertices. This method improves the "blocky" look and provides an appearance of plastic or metallic surfaces. It's well suited for making round objects look smooth.

GPI _ *General Purpose Interface* - This is used for cueing equipment - usually by a contact closure. It is simple, frame accurate and therefore can easily be applied over a wide range of equipment. Being electro-mechanical it cannot be expected to be as reliable as pure electronic controls.

GPIB _ *Graphic Port Interface Bus* - A standard interface in the graphic arts for graphic computers and peripherals.

GPS _ *Global Positioning System* - A satellite-based radio navigation system. Using 24 MEO satellites for identifying earth locations, the first GPS satellite was launched in early 1978. By triangulation of signals from three of the satellites, a receiving unit can pinpoint its current location anywhere on earth to within 20 meters horizontally. With GPS, the "James Bond" style of on-screen, mobile map reading became a reality by the mid-1990s. By 2000, in-the-dash GPS-based "navigation systems" were standard or at least an option in luxury cars, and third-party systems are available for all cars. Such systems include a CD-ROM reader or hard disk that reads the digital maps that guide you to your destination city or street address. They can even take you to the nearest gas station, hotel, restaurant and many other points of interest. Newer DVD-based systems provide coverage of the entire continents and are amazingly accurate and helpful. In time, built-in navigation systems are expected to be an option for all classes of cars.

Grab _ To select a portion of the screen's image for editing or insertion into another file.

Gradation _ A smooth transition between black and white, one color and another, color and no color.

Grade Color _ The colorimetry of a scene and the correction of this.

Gradient _ A smooth blending of shades from light to dark or from one color to another. In 2-D drawing programs and paint programs, gradients are used to create colorful backgrounds and special effects as well as to simulate lights and shadows. In 3-D graphics programs, lighting can be rendered automatically by the software.

Gradient Fill _ An image fill that gradually transitions from one color to another; commonly used in graphics editors.

Graduation _ A smooth transition between black and white and from one color to another, or color deficiency.

Grain _ a) A texture or mottling effect. **_ b)** Listening term. A sonic analog of the grain seen in photos. A sort of grittiness added to the sound.

Grand Alliance _ The United States grouping that was formed in May 1993, to propose "the best of the best" proposed HDTV systems. The participants were - AT&T, General Instrument Corporation, Massachusetts Institute of Technology, Philips Consumer Electronics, David Sarnoff Research Centre, Thomson Consumer Electronics and Zenith Electronics Corporation. The Grand Alliance played a big part in arriving at the ATSC digital television standard.

Granularity _ An image fill that gradually transitions from one color to another; commonly used in graphics editors.

Graphic Equalizer _ a device type that applies a series of band pass filters to a sound, each of which works on a certain range of the spectrum. The frequencies that fall within the range, typically one-third octave, can be boosted or cut. The name comes about because the fader positions provide a graphic representation of the EQ curve.

Graphics _ The creation and manipulation of picture images in the computer. Anything that is produced using a graphics program, even a text title, is considered a graphical element, because it is formatted differently than the plain text that follows it. A fast desktop computer is required for graphics work, and although a mouse can be used for drawing, graphics tablets are widely used for CAD (computer-aided design) applications. A scanner is also typically used. Two methods are used for storing and maintaining pictures in a computer. The first method, called "vector graphics," maintains the image as a series of points, lines, arcs and other geometric shapes. The second method, called "bit-mapped graphics" and also known as "raster graphics," resembles television, where the picture image is made up of dots..

Graphics Acceleration _ The technique of increasing graphics processing speed.

Graphics Card _ An expansion card that interprets commands from the main processor and directs them to the monitor. If you want a higher resolution picture (or one somewhat better than you've got at present) update your Graphics Card from 2D to 3D and look at the difference on a good 17" monitor.

Graphics Conversion _ Changing one graphics format to another. There are two problems associated with this. One is that the target format may not have the inherent capabilities of the original. For example, if the original supports 24-bit color, such as a TIFF, and the target format only supports 8-bit color, such as GIF, there will be a loss of color depth. Another example would be a vector illustration that supports gradients, and the target format does not. These are all limitations of the file formats themselves. The second problem is that graphics conversion requires tedious programming, and the graphics filters (import and export functions) in an application do not always work perfectly, witness the following example below. The top one is the original, and the bottom was created using the JPEG export filter in the application. They may be similar, but are by no means identical.

Graphics Coprocessor _ Graphics hardware that performs various 2-D and 3-D geometry and rendering functions, offloading the main CPU from performing such tasks. This typically refers to a very high-end graph-

ics subsystem, but may also refer to a graphics accelerator.

Graphics Engine _ Software that generates interactive 2D and 3D graphics. Examples of graphics engines are Direct3D and OpenGL.

Graphics Formats _ There is a wide variety of graphics formats in use today. The following list contains most of them. The formats are in order by extension name under bit-mapped or vector category. Some formats appear in both categories because they can hold both raster and vector images.

Graphics Library _ A tool set for application programmers. It usually includes a defined set of primitives and function calls that enable the programmer to bypass many low-level programming tasks.

Graphics Monitor _ A monitor capable of a horizontal scan rate of 15.75 kHz to 75 (80) kHz. Graphics monitors and projectors accept inputs from NTSC & PAL video, CGA, and VGA, as well as high-resolution workstations.

Graphics Overlay _ Text or a graphics image that's superimposed on video. *Also called* super.

Graphics Pipeline _ A sequence of operations that creates an image from user defined settings to final output. The pipeline determines how color information and geometric coordinates are processed in the hardware and software.

Graphics Primitive _ An elementary graphics building block, such as a point, line or arc. In a solid modeling system, a cylinder, cube and sphere are examples.

Graphics Viewer _ An application that displays graphics file formats. Although such programs provide basic image editing, their main purpose is to quickly preview and organize images. They also detail a file's attributes such as file size, resolution in dpi and inches and so on.

Grating Light Valves (GLV) _ The Grating Light Valve was created by Professor David Bloom at Stanford University. The integrated circuit consists of miniature reflective ribbons mounted over a silicon chip. Application of an electrical field to the silicon below the ribbons causes the ribbon to distort. This alters the reflective quality of the ribbon allowing control of the light reflected onto an image.

Gray Level _ The brightness of a pixel. The value associated with a pixel representing it's lightness from black to white. Usually defined as a value from 0 to 255, with 0 being black and 255 being white.

Gray Scale _ The term gray scale has several meanings. It some cases, it means the luma component of color video signals. In other cases, it means a black-and-white video signal. In video applications, grayscale is usually expressed in 10 steps.

Gray Scale Monitor _ The display of distinct gray, black and white pixels.

Grayscale Image _ A single channel 8-bit image with up to 256 shades of gray. (A traditional black and white photo)

Grayware _ The human brain.

Greek _ In desktop publishing, to display text in a representative form in which the actual letters are not discernible, because the screen resolution isn't high enough to display them properly. The software lets you set which font sizes should be greeked. The term comes from typography and graphics design, in which Greek or Latin words are used in a mock-up. They hold the position and represent the real text that will be forthcoming. Foreign symbols are used so that the text can be quickly identified as fake.

Grid _ Regularly spaced horizontal and vertical lines across the picture for accurate positioning when moving elements for compositing.

Ground Station _ A receiver and / or transmitter that can receive and/or transmit TV signals to a satellite.

Group of Pictures _ In an MPEG signal the GoP is a group of frames between successive I frames, the others being P and/or B frames. In the widest used application, television transmission, the GoP is typically 12 frames but this can vary--a new sequence starting with an I frame may be generated if there is a big change at the input, such as a cut. If desired, SMPTE time code data can be added to this layer for the first picture in a GoP.

Groupware _ Groupware is software that lets users share and collaborate. The heart of a groupware system is e-mail, since e-mail is used to notify and alert team members on a daily basis. The primary data collaboration tools are electronic whiteboards, which is a

shared "chalkboard," and application sharing, which lets remote users work in the same application together. Some form of human communication is also necessary, so either text chat, audio or videoconferencing becomes part of the total system.

GSM _ *Global System for Mobile Communications -* A digital cellular phone technology based on TDMA that is the predominant system in Europe, but is also used around the world. Developed in the 1980s, GSM was first deployed in seven European countries in 1992. Operating in the 900MHz and 1.8GHz bands in Europe and the 1.9GHz PCS band in the U.S., GSM defines the entire cellular system, not just the air interface (TDMA, CDMA, etc.). As of 2000, there were more than 250 million GSM users, which is more than half of the world's mobile phone population. GSM phones use a Subscriber Identity Module (SIM) smart card that contains user account information. Any GSM phone becomes immediately programmed after plugging in the SIM card, thus allowing GSM phones to be easily rented or borrowed. SIM cards can be programmed to display custom menus for personalized services. GSM provides a short messaging service (SMS) that enables text messages up to 160 characters in length to be sent to and from a GSM phone. It also supports data transfer at 9.6 Kbps to packet networks, ISDN and POTS users. GSM is a circuit-switched system that divides each 200 kHz channel into eight 25 kHz time slots.

Guard Bands _ The gaps between video tracks on a tape which prevent "crosstalk."

GUI _ *Graphical User Interface* - A means of operating a system through the use of interactive graphics displayed on a screen. Examples in the computer world are the Apple Macintosh and Microsoft Windows, both designed for general purpose use and usually operated with a mouse. Most video editing software programs are only as good as their GUI. If it's easy to navigate and get around, you can learn quickly. If not, it will take you awhile. Another example is the on-screen menu system in a DVD player.

Guiltware _ Shareware that makes a poignant plea to the user to purchase the product and support the developers, because they worked so hard making it.

Gulp _ An unspecified number of bytes.

H or HV _ Horizontal (H) sync, or horizontal and vertical sync combined (HV). On connector panels, "H" identifies the connector for horizontal sync and "H/HV" means it is also used for combined or "composite" horizontal and vertical sync (RGBS).

Haas Effect _ If sounds arrive from several sources, the ears and brain will identify only the nearest. In other words, if our ears receive similar sounds coming from various sources, the brain will latch on to the sound that arrives first. If the time difference is up to 50 milliseconds, the early arrival sound can dominate the later arrival sound, even if the later arrival is as much as 10 dB louder. The discovery of this effect is attributed to Halmut Haas in 1949.

Hack _ Program source code. You might hear a phrase like "nobody has a package to do that, so it must be done through some sort of hack." This means someone has to write programming code to solve the problem, because there is no pre-written routine or function that does it. The purist would say that doing a hack means writing in languages such as assembly language and C, which are low level and highly detailed. The more liberal person would say that writing any programming language counts as hacking.

Hacker _ Slang for a non-professional dedicated computer operator.

HAD CCD _ Sony's high performance CCD HAD (Hole-Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology. Efforts for more pixels and smaller size for CCD have resulted in a smaller aperture area of sensor, presenting the problem of lower sensitivity. To improve this, a lens has been provided on the top of the sensor for focusing, which increases the virtual aperture area of the sensor for higher sensitivity. That is what is called the on-chip microlens. Sony, the first to adopt it for the CCD image sensor, has thus successfully achieved higher sensitivity.

HAL _ *Heuristic/Algorithmic* The computer in the film "2001," which takes over command of the spaceship. Each of the letters in H-A-L coincidentally precede the letters I-B-M.

Half-Duplex _ A communications Protocol that permits transmission in both directions but in only one direction at a time.

Half-Height Drives _ Standard 3.5-inch hard drives are available in heights of 1.0 inch and 1.6 inches. Half-height drives measure 1.6 inches in height.

Halftone Image _ An image reproduced through a special screen made up of dots of various sizes to simulate shades of gray in a photograph. Typically used for newspaper or magazine reproduction of images but it is also how today's inkjet printers work. Halftoning or dithering are the methods used to produce a smooth gradation of color versus distinct bands of color or moiré patterns.

Handheld _ A type of video games machine that is small enough to be powered by batteries and is therefore portable. An example is the Nintendo Game Boy Advance. Also describing the use of small camcorders.

Handles _ **a)** In computer graphics, a tiny, square block on an image that can be grabbed for reshaping. _ **b)** In non linear editing Extra frames specified before the In and Out points of a clip that may be needed to accommodate transitions or editing adjustments.

Hard Coded _ These are computer chips or memory that contain software instructions which have been programmed into them when they were manufactured on the production line.

Hard Disk _ A ferromagnetic medium for storing bigger quantities of digital computer data. A hard disk is a rotating disk (or disks) held inside a gas filled metal case. The hard disk is subdivided into sectors in which data are stored. An address book makes sure that the stored data can be found later on. The magnetic disk rotates, and an axially movable write/read head is positioned in such a way that the individual sectors can be read or newly written. The most important factor apart from the storage capacity indicated in gigabyte is the velocity of the disk. In particular in the case of non-linear editing systems, very fast hard disks are required, since the performance of the systems is, among other aspects, also determined by the performance of

the hard disk. It is of particular importance that a data transmission rate as high as possible be reached without interruption of the write and read operations (sustained data rate). A good measure for the quality of a disk is the minimum data rate guaranteed by the manufacturer. The maximum top values often mentioned are of lesser importance in video operations. If longer video scenes are to be diskrecorded, the continuously reached data rate should not drop, since this could cause dropouts, i.e. interruptions in the motions. Some manufacturers offer special AV hard disks. Their special controlling software suppresses recalibration of the disk during writing or reading processes.

Hard Disk Drive Controller _ Controller electronics that include the Disk Controller and the Interface Controller.

Hard Dot _ A dot with smooth ,crisp edges.

Hard Error _ An error that is repeatable every time the same area on a disk is accessed. A hard error cannot be corrected by the error recovery process.

Hard Sectored _ A technique that uses a digital signal to indicate the beginning of a sector on a track.

Hard Wired _ This refers to devices, ports and chips etc, all connected to the motherboard of the computer as it's being assembled. It doesn't include any cards that may be plugged in and out after production is completed in the factory.

Hardware _ Any physical part of a computer system that you can rap your knuckles on. E.g. - ICs and other electronic and their associated boards, connectors, and mechanical packaging monitor, keyboard, mouse, printer, scanner, camera, speakers or external plug-in device.

Hardware Acceleration _ Good quality graphics cards often have their own processor which takes the strain off your computers processor when it comes to completing intensive tasks such a displaying ever changing images like those in "shoot-me-up games".

Hardware iDCT _ iDCT stands for *Inverse Discrete Cosine Transform*. It is a mathematical formula used in DVD encoding/decoding. Certain assistance cards have iDCT hardware. In combination with Motion Compensation, iDCT can accelerate DVD

playback by moving approx. 70% of the DVD decoding process onto the card itself, allowing for smooth DVD playback on even a 200mhz MMX CPU.

Hardware Motion Compensation _ Some chipsets (ATI Rage Pro, ATI Rage Fury, S3 Savage 3D) have Hardware Motion Compensation support. Motion Compensation is said to improve DVD decoding time by 30%. However, when using motion compensation, make sure to set the DeInterlacing mode to "Force Weave" when playing DVD Movie Titles. Otherwise it will actually slow down the DVD playback.

Hardware Platforms _ Each hardware platform, or CPU family, has a unique machine language. All software presented to the computer for execution must be in the binary coded machine language of that CPU. Following is a list of the major hardware platforms in existence today.

Hardware Profile _ Settings that define a specific configuration of peripherals and drivers. Multiple profiles let you set up more than one hardware configuration, which is commonly done when a laptop also serves as a desktop computer. The desktop profile activates one set of peripherals, the laptop profile another. A separate hardware profile is also used as a last resort when an application conflicts with one of the drivers that is routinely loaded. A special profile is created that boots the computer without the problem driver so the application can run. In order to run the rest of the programs, the machine must be rebooted with the regular profile.

Hardware Scaling _ Enlarging a video frame by performing the operation within the circuits of the display adapter. Putting the function in a chip speeds up the process.

Hardware Virtual Memory _ Virtual memory capability built into the CPU chip. Although virtual memory can be performed in software only by the operating system, performance is much better when special functions in the hardware assist the operation.

Hardware-accelerated Effect _ An effect that requires the assistance of dedicated hardware, to play back in real time.

Harmonic Distortion _ The addition of harmonics that were not present in the original signal.

Harmonics (in music - **overtones**) _ Multiples of an original frequency that add to and modify the original frequency. A pure sine wave is free of harmonics. In music, it is what makes one instrument sound different from another while playing the same note. This is usually a desirable effect in music. However, when harmonics occur in electronic signals, it adds distortion to the original signal, causing undesirable results.

HAVi _ A standard, based on the IEEE 1394 interface, that allows all manner of digital consumer electronics and home appliances to communicate with each other. Developed by Grundig AG, Hitachi Ltd., Matsushita Electric Industrial Co. (Panasonic), Royal Philips Electronics, Sharp Corporation, Sony Corporation, Thomson Multimedia and Toshiba Corporation.

HCI _ *Human Computer Interaction* - Refers to the design and implementation of computer systems that people interact with. It includes desktop systems as well as embedded systems in all kinds of devices. Although the user interface is the primary element between user and computer, HCI is a larger discipline that deals not only with the design of the screens and menus, but with the reasoning for building the functionality into the system in the first place. It is also concerned with the consequences of using the system over time and its effects on the individual, group and company.

HD _ **a)** Hard drive (aka HD_ D), the internal, large-capacity data storage unit in today's PC computers. _ **b)** Short form for HDTV.

HD connector _ A high-density "D" connector having its pins arranged close together, sometimes in three rows instead of two rows. Example - a 15-pin VGA connector (HD) vs. a Mac connector (D).

HD D5 _ A compressed recording system developed by Panasonic which uses compression at about 4 :1 to record HD material on standard D5 cassettes. HD D5 supports the 1080 and the 1035 interlaced line standards at both 60 Hz and 59.94 Hz field rates, all 720 progressive line standards and the 1080 progressive line standard at 24, 25 and 30 frame rates. Four uncompressed audio channels sampled at 40 kHz, 20 bits per sample, are also supported.

HDCam _ Sometimes called HD Betacam, is a means of recording compressed high-definition video on a tape format (1/2-inch) which uses the same cassette shell as Digital Betacam, although with a different tape formulation. The technology supports both 1080 and 1035 active line standards in 16 :9 format. Quantization from 10 bits to 8 bits and DCT intra-frame compression are used to reduce the data rate. HDCAM records 12 Tracks with a width of 20 mm each per frame and compresses the digital data internally by factor 4 :1. The tape is described as a 14 mm wide metal particle tape with extremely fine particles (length - 0.125 mm) having a video data rate of 140 Mbits/s. Four uncompressed audio channels sampled at 48 kHz, 20 bits per sample, are also available.

HDCAM SR Format _ A next generation High Definition videotape format developed by Sony. It uses a 1/2" wide tape stock and can record either 22:22:22 10bit HD video, 22:11:11 10bit HD Video, or a special double speed mode for 2 channels of 22:11:11 10 bit HD Video. It uses a light compression scheme to reduce the data rate 2.7:1 (for 22:11:11) to approximately 440Mb/s.

HDD _ *Hard Disk Drive*.

HD-DIVINE _ A Scandinavian digital terrestrial HDTV project proposed in 1991.

HD-DVD _ This is a proposed name for a next generation DVD-Video disc. Currently industry is fighting over the specs of the standard - there are two suggested specifications for the standard which are competing _ **a)** suggested by most technology companies is the spec which would continue using MPEG-2 as a video format for the discs, but start using next generation blue-laser discs instead of old red laser discs _ **b)** other proposal suggests that companies continue to use the existing DVD media which holds appx. 4.36GB of data per one layer per one side, but start using MPEG-4 as a compression format instead of currently used MPEG-2

HDMI _ Abbreviation for **High Definition Multimedia Interface**, a single-cable digital audio/video interface for consumer equipment.

HD-SDI _ This is a high definition version of the SDI (Serial Digital Interface) used for SD television. The serial bit-stream runs at 1.485 Gb/s to carry up to 10-bit YCrCb component video as well as audio and ancillary data. It extends the use of the coax cable and BNC connector "plug-and-play" interface familiar to television operations for decades. The interface is also specified for fiber for distances up to 2 km.

HD-SDTI _ *High Data-Rate Serial Data Transport Interface*, defined by SMPTE 348M.

HDSL _ acronym for *high-speed DSL*.

HDTV _ *High Definition Television* - A television format with a screen aspect ratio of 16 :9 and approximately twice the resolution in both horizontal and vertical dimensions of existing standard definition television (SDTV). It was invented in the late 20th century. There is no agreement for the hoped-for world HDTV studio standard. The only consensus so far is that transmission, for home viewing and contribution, will be digital and compressed using MPEG-2. Current formats generally range in resolution from 655 to 1,125 scan lines, with an aspect ratio of 9 to 16, and bandwidth of 30 to 50 MHz. In Europe 1250 lines/50 fields, with its simple relationship to 625 lines/50 fields is favored, while in the USA the ATSC describes different picture sizes and frame rates, not all of which are HD, with the most talked about of these being 1080i (1080 active lines, interlaced) with some interest in the 720p also. In 1941, our current 525 line system was referred to as HDTV.

HDV _ In 2003, four companies – Canon, JVC, Sharp and Sony announced a joint development of basic specifications for "HDV" format which realizes recording and playback of high-definition video on a DV cassette tape. The HDV format includes 720p (progressive) and 1080i (interlaced) specifications, and enables the development of products conforming to the global high-definition infrastructure. The HDV format specifies the data recording of MPEG2 inter-frame compressed high-definition signals. Video signals are compressed by MPEG2 encoding (profile & level: MP@H-14) as BS digital broadcasting, making possible the recording and playback of high-definition video at a bit rate equivalent to the DV format SD (standard definition) specifications (intra-frame compression.) Sampling frequency for Luminance is 74.25MHz (720p) and 55.7MHz (1080i), sampling format 4:2:0, Quantization - 8 bits (both luminance and chrominance) and Bit rate after compression approximately 19Mbps (720p), or 25Mbps (1080i). Aspect Ratio is always 16:9. Audio signals are digitized with a 48kHz/16-bit quantization sampling frequency and compressed to 384kbps by MPEG1 Audio Layer II encoding. Because the new format employs the same cassette case, tape speed, and track pitch as the DV format, it can utilize mechanical parts based on it. It also makes it easy for manufacturers to undertake the development of products that are highly compatible with the DV format. Stream Interface is the same as DV - IEEE1394 (MPEG2-TS).

HE-AAC _ *High-Efficiency Advanced Audio Coding* - Audio standard within the MPEG-4 standard.

Head _ The minute electromagnetic coil and metal pole which write and read back magnetic patterns on the disk. Also known as a read/write head. A drive with several disk surfaces or platters will have a separate head for each data surface.

Headroom _ **a)** Space between the top of the subject and a monitor's upper screen edge. Leaving space for "headroom" is common practice. _ **b)** When capturing audio, extra data acquired as a result of capturing at higher quality settings than needed for the final cut. Headroom helps preserve quality when adjusting audio gain or applying certain audio effects. _ **c)** The ability of an amp to go beyond its rated power for short durations in order to reproduce musical peaks without distortion. This capability is often dependent on the power supply used in the design.

Helical Scan _ Method of video recording in which a rotating drum records a long diagonal series of tracks across the videotape.

Hertz (Hz) _ Abbreviation for Hertz Measuring unit for a frequency named after Heinrich Hertz. X Hertz correspond to x oscillations per second.

Hexadecimal _ A numbering system, often referred to as "Hex", that works to base 16 and is particularly useful as a shorthand method for describing binary numbers. Decimal 0-9 are the same as Hex, then 10 is A, 11 is B, up to 15 which is F.

HFC _ *Hybrid fiber coax* - A type of network that contains both fiber-optic cables and copper coaxial cables. The fiber-optic cables carry TV signals from the head-end office to the neighborhood; the signals are then converted to electrical signals and then go to coaxial cables.

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

HGA _ *Hercules graphics adapter* - A 1982 monochrome display adapter that produced 720 x 348 resolution text and graphics. It was developed by Hercules Computer Technology.

Hi8 _ Entering the camcorder market from the same high resolution angle as Super VHS, the Hi8 format is using metal evaporated technology to offer better pictures than 8mm, making it the most impressive analogue format available. Separate processing of luminance (Y) and chrominance (C) signal and a larger video frequency of bandwidth of Hi 8 enables a higher resolution than with Video 8 providing approximately 400 lines of resolution on SDTV. The low weight of both the camcorder and cassettes is important as is the availability of long playing time. Today replaced by D8 and DV.

HID _ *Human Interface Device* - A class of peripheral device that enables people to input data or interact directly with the computer, such as with a mouse, keyboard or joystick. The HID specification is a part of the USB standard, thus USB mice and other USB user input devices are HID compliant. Windows 2000 defines HID standards that enable drivers to be written for such devices no matter which connection is used (USB, serial port, etc.).

Hidden Surface Removal _ Hidden Surface Removal or visible surface determination entails displaying only those surfaces that are visible to a viewer because objects are a collection of surfaces or solids.

Hierarchy _ When modeling a character, it is often useful to establish a hierarchy between all the objects making up the character. To explain what hierarchy is let us consider a model of a human. You have 5 fingers. Each of the fingers is connected to your hand. The hand is connected to your lower arm which in turn is connected to your upper arm. Finally the whole arm is connected to your torso. If you were to model a human arm, you would probably set up the same type of hierarchy. You would connect the fingers to the hand and the hand to the lower arm and the lower arm to the upper arm. You might ask yourself how does this help you. Well, consider animating this arm. If the objects were all disconnected, you would have to place each part of the whole arm in the appropriate position. With an established hierarchy, you start with the object highest up in the hierarchy

and position it in place. When you do this, all the objects further down follow. Then you continue going down the hierarchy until the whole arm and its components are in the position you want them to be in.

HiFD Disk _ *High Capacity Floppy Disk* - A 3.5" diskette from Sony and Fuji Photo Film Company that holds 200MB. HiFD drives read and write standard 1.44MB floppy disks. Never really took of.

HI-FI _ Abbreviation for high fidelity, referring to high-quality audio tracks recorded by many VCRs. Absence of distortion or enhancements. Audio quality of these tracks approaches that of a CD.

High Definition Television _ Offers approximately twice the vertical and horizontal resolution (clarity) of SDTV television. Provides crystal-clear quality widescreen pictures with compact disc-quality surround sound.

High Key Image _ A high key image is distinguished by overall bright, light tones. To obtain an effective high key image, it is important that subject details do not completely melt into the white background; the white parts should provide contrast to the few dark parts.

High Resolution _ a) A large amount of information per square inch on a display screen or printed form. Measured in dots per inch (dpi), the more dpi, the higher the resolution and quality. Monitors (both CRTs and flat panels) are in the 70-120 dpi range whereas printers are in the 300-1,200 dpi range. Imagesetters typically print at 1,270 or 2,540 dpi. **_ b)** A large amount of information on screen. This is technically "screen resolution." For example, a 1600x1200 screen resolution shows more information than 800x600. **_ c)** A large amount of information per second in a digital audio recording. Measured in samples per second as well as the size of each sample, the more of either one or both, the higher the quality.

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

High Technology _ Refers to the latest advancements in computers and electronics as well as to the social and political environment and consequences created by such machines.

Highlight _ The lightest (or whitest) area of an image.

Highpass Filter _ A circuit that passes frequencies above a specific frequency (the cutoff frequency). Frequencies below the cutoff frequency are reduced in amplitude to eliminate them.

Hint Track _ Term used in Apple's Quick-Time architecture for the set of streaming instructions which, in the QuickTime streaming format, are embedded right into the movie. Other architectures provide streaming instructions as *metafiles* which are often downloaded separately from the actual movie file.

Hinted Movie _ Term used in Apple's Quick-Time architecture for video files that are formatted for *true streaming*.

HIPPI _ *High performance parallel interface* - A parallel data channel used in mainframe computers that supports data transfer rates of 100 Mbps.

Hi-Scan 1080iChassis _ Hi-Scan 1080i chassis correctly display 1080i (interlaced) lines of video content when delivered to the TV via Component video inputs using an appropriate HDTV external receiver/decoder. Will also display 480p (progressive) with progressive scan devices such as DVD players.

Hiss _ Noise caused by random electrical fluctuations.

Histogram _ A bar graph analysis tool that can be used to identify contrast and dynamic range of an image. Histograms are found in the more advanced digicams and software programs (graphic editors) used to manipulate digital images. The histogram shows a scale of 0 - 255 (left to right) with 0 being black and 255 being white.

Hit _ A single request from a web browser for a single item from a web server. Each time you request a web page you score a Hit on the index page and every time you click on a graphic image on that page, or visit another web page from the index page you score another Hit.

Hit Counter _ A special program or utility that records the number of "hits" on a web site or pages within that site.

HMD _ *Head-Mounted Display -* A piece of hardware that is strapped over the eyes and presents the user with two screens. Such

technology can also feature tracking so that where the user turns his head, the image being displayed adjusts accordingly.

Hold _ An interpolation setting that maintains settings from one key frame until the next key frame and uses the space of only one frame to jump to the next setting.

Holographic Storage _ An optical technology that records data as holograms that fill up the entire volume of a small optical cylinder no larger than one millimeter by one centimeter. The hologram is created by two lasers. One laser is beamed into the lithium niobate optical material through a matrix of LCD shutters, called a "spatial light modulator." The shutters are opened or closed based on the binary pattern of the page of data being stored. For example, using a matrix of 1,024 pixels on each side, the page could hold a million bits. A reference laser is angled into and intersects with the data laser at the storage unit. If the angle and/or frequency is changed, another hologram can be created overlapping and filling the same space as the first hologram. In fact, 10,000 holograms (pages) can overlap each other. The page is read by directing just the reference laser back into the hologram. The light is diffracted into an original copy of the data which is sensed by a matrix of CCD sensors. Holographic devices could hold 50 million images or 10 billion pages of text and deliver them instantaneously. Although research in this area stems back to the 1960s, holographic storage was not announced as a commercial product until 2002, when InPhase demonstrated its Tapestry holographic disk drive and media.

Holy Grail _ A very desired object or outcome that borders on a sacred quest. There are several Holy Grails in the computer business. Standards tend to be high on the list; for example, having "one" standard that everybody uses and is happy with for each required area. Writing software once and having it run on every computer platform is also desired by many. Another is a software component architecture that allows software modules to "plug together" like hardware components, no matter the platform they run on or which programming language they were written in. The term's original meaning is the chalice that Joseph of Arimathea used to collect drops of Jesus' blood at the Crucifixion. Legends of the quest for the Holy Grail, which would bring healing and eternal life, have been recounted in various ancient treatises.

Home Page _ This is the main navigation page on a Web Site owned by a company or private individual. It's known as the index.htm (or index.html) page and it is the first page you see when you visit a Web site. It usually contains hyperlinks to other pages within the Web site and occasionally may contain links to other external Web sites of interest.

Home Shopping _ These are channels which sell goods via digital TV. Depending on which system you have, you can order their items either by phoning up or by using your remote control.

Home Theater _ An audio/video entertainment center that has a large-screen TV and hi-fi system with three speakers in the front (left, right and center) and left and right speakers in the rear. Starting in the early 1990s, video inputs were added to stereo receivers and preamplifiers. Today, almost all vendors make a combination audio/video control center for home theater listening and viewing.

Horizontal Blanking _ After making a scan line (left-to-right), the electron beam in a CRT retraces (returns) to the left side of the screen to begin the next line. During retrace time it is not putting picture information on the screen, so the beam is turned off, or "blanked". About 83% of each horizontal cycle is spent writing the line, while 17% is spent retracing the beam to the left before starting the next line.

Horizontal Pixels _ Refers in digital video to the number of discrete elements per scanning line (interlaced or progressive scan) used to generate and display an image in the horizontal screen direction, which are derived from the multiple of the horizontal scanning or subcarrier frequency. Digitized NTSC and CCIR-601 signals will produce non square pixel displays.

Horizontal Resolution _ Vertical resolution is determined in today's TV systems by the number of lines . The horizontal resolution may vary between different devices and formats. Horizontal resolution is determined by means of test signals or test charts. They show vertically arranged, parallel lines. The number of lines (or the frequency corresponding to it) that the respective device can display as a pattern consisting of individual lines is used as a measure. Maximum resolution of a system or device can be expressed in lines or frequency. The conversion formula is - MHz x 82 = resolution in lines. The maximum horizontal resolution of the PAL standard is 5 MHz, i.e. 410 lines. VHS devices reach a maximum horizontal resolution of approx. 3 MHz (approx. 250 lines).

Horizontal Scan Frequency _ The frequency at which horizontal sync pulses start the horizontal retrace for each line. A high frequency is needed for a non-interlaced scan.

Horizontal Sync _ This is the portion of the video signal that tells the display where to place the image in the left-to-right dimension. The horizontal sync pulse tells the receiving system where the beginning of the new scan line is.

Host _ The computer on the other end of a network connection from your computer that contains the information you are trying to access. It can also mean to store the content or data on a computer that is connected to a network; can be a synonym for *server*. The term "host" is also used to refer to businesses that provide such systems. A hosting services provider (HSP) is an application service provider (ASP) dedicated to providing hosting services.

Host Adapter _ A plug-in board that acts as the interface between a computer system bus and the hard drive.

Hot Swap _ The ability to add and remove devices to a computer while the computer is running and have the operating system automatically recognize the change. The USB and Firewire interfaces support Hot Swap.

Hot-Plug/Hot-Swap _ Term that refers to the connection and disconnection of external equipment without having to turn the power off. External peripherals such as WD's FireWire hard drives may be hotplugged/ hot-swapped under certain conditions.

HPB _ Video gamers take note as you're about to enter this world. An HPB is a *high-ping bastard* - a player in an online game whose slow Internet connection puts him at a disadvantage against players with faster connections. The increased data transfer time delays the onscreen action, making it difficult for the player to gauge his or her response times.

HSB _ In color graphics, *hue-saturation-brightness.* Hue = the color, saturation = the amount of color, and brightness = the amount of white.

HSI _ stands for *Hue, Saturation and Intensity*. HSI is based on polar coordinates, while the RGB color space is based on a three-dimensional Cartesian coordinate system. The intensity, analogous to luma, is the vertical axis of the polar system. The hue is the angle and the saturation is the distance out from the axis. HSI is more intuitive to manipulate colors as opposed to the RGB space.

HSM _ *Hierarchical Storage Management* The automatic movement of files from hard disk to slower, less-expensive storage media. The typical hierarchy is from magnetic disk to optical disk to tape. HSM software constantly monitors hard disk capacity and moves data from one storage level to the next based on age, category and other criteria as specified by the network or system administrator. HSM often includes a system for routine backup as well.

HSV _ A color model based on three coordinates - hue, saturation and value

HTML _ *Hypertext Markup Language* - The tagging language used to format Web pages. It allows pictures and text to be combined to create Web documents and the most common feature is hypertext which makes it possible to link between different pages or documents within a Web Site. HTML 2.0 was defined by the Internet Engineering Task Force (IETF) with a basic set of features, including interactive forms capability. Subsequent versions added more features such as blinking text, custom backgrounds and tables of contents. However, each new version requires agreement on the tags used, and browsers must be modified to implement those tags. HTML is not a programming language like Java or JavaScript (if this, do that), rather it could be considered a "presentation language." HTML is derived from SGML, the Standard Generalized Markup Language. HTML is an SGML document with a fixed set of tags that, although change with each new revision, are not flexible. A subset of SGML, known as XML, allows the developer of the page to define the tags, and HTML 4.0 and XML 1.0 have been combined into a single format called "XHTML," which is expected to become the standard format for Web pages. XHTML also enables Web pages to be developed with different sets of data so that handheld devices, with limited screen sizes, can download abbreviated pages. Like many successful technologies in the computer field, its creators had no idea that they would become world class standards, and HTML is no

exception. Turning Web sites into the multi-media extravaganzas common today have required HTML to be reworked and jury-rigged over and over. The resulting source code you see today in most Web pages is a hideous concoction of coding, which is required to conform to HTML's original, simple architecture.

HTML Editor _ A software program that lets a Web Designer view and edit the hidden html code within a web page. Some modern html editors will both create the code for the designer and modify it as and when required.

HTTP _ Short for HyperText Transfer Protocol, the underlying protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands. For example, when you enter a URL in your browser, this actually sends an HTTP command to the Web server directing it to fetch and transmit the requested Web page.

Hub _ Connects many network lines together as if to make them all part of the same wire. This allows many users to communicate but, unlike a switch, only one transaction can occur at once over the whole network.

Hue _ a) The distinction between colors (e.g., red, yellow, blue, etc.). White, black, and gray tones are not considered hues. **_ b)** The color tint of a video image. The color of an analog video signal is determined by three factors - hue, saturation and brightness. In a composite video signal, the hue is determined by the phase relationship to the color burst.

Huffman Coding _ Huffman coding is a method of data compression. It doesn't matter what the data is - it could be image data, audio data, or whatever. It just so happens that Huffman coding is one of the techniques used in JPEG, MPEG, H.261, and H.263 to help with the compression. This is how it works. First, take a look at the data that needs to be compressed and create a table that lists how many times each piece of unique data occurs. Now assign a very small code word to the piece of data that occurs most frequently. The next largest code word is assigned to the piece of data that occurs next most frequently. This continues until all of the unique pieces of data are assigned unique code words of varying lengths. The idea is that data that occurs most frequently is assigned a small code word, and data that rarely occurs is assigned a long code word, resulting in space savings.

Hum _ The coupling of an unwanted frequency into other electrical signals. In audio, "hum" can be heard; in video, it can appear as waves or bars in the picture. Often it is an audible disturbance caused by the power supply, or an improper ground.

Humbucker _ A transformer used to isolate video signals caused by interference from hum bars or moiré.

HVS _ *Human Visual System* - Studies of human visual perception considered when weighting the reduction of bandwidth in the components of the image to give the best perceived image quality. Human visual perception allows the color space to be weighted toward the luminance content of an image; much of the color detail information can be discarded without a noticeable loss in image quality.

HWID _ *HardWare ID* - Starting with the Windows XP Windows Product Activation (WPA) system, the HWID is a unique number generated when Windows is installed. It is derived from the current configuration of the hardware and is used to determine if this version of Windows has been moved to a different machine.

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

Hybrid Computer _ A digital computer that accepts analog signals, converts them to digital and processes them in digital form. It is used in process control and robotics.

Hybrid Editing Systems _ Hybrid systems are editing and processing systems which simultaneously control non-linear sources (hard disks, MO disks) as well as linear sources (video recorders), capable of mixing signals from both sources.

Hyper MIG Video Head _ Based on technologies developed for DV camcorders, the new MIG (metal-in-gap) video head boosts the luminance signal by up to 30% and chrominance signal by up to 10%, while greatly reducing noise. All this in combination with XR technology gives a much better picture quality and greats customer satisfaction.

Hyperlink, or Hypertext Link _ Those funny little hands that appear like magic whenever you move your mouse over a heading or subject title. Hyperlinks are highlighted text or images which when selected (by clicking the mouse) follow a link to another page or another item within the same page. Hyperlinks can also be used to automatically download such things as sound or video clips, etc. Hypertext is the foundation of the World Wide Web. Links embedded within Web pages are addresses to other Web pages either stored locally or on a Web server anywhere in the world.

Hyper-Threading _ A feature of server versions of Pentium 4 chips that makes one physical CPU appear as two logical CPUs. It uses additional registers to overlap two instruction streams in order to achieve an approximate 30% gain in performance. Multithreaded applications take advantage of the Hyper-Threaded hardware as they would on any dual-processor system; however, the performance gain cannot equal that of true dual-processor CPUs.

Hz _ An abbreviation for Hertz - an international unit of frequency which equals one cycle per second.

i.Link _ Exact same thing as FireWire, just a different, Sony's, name. A computer interface, introduced by Apple Inc. in 1987, offering transfer rates of 400 Mbps. Firewire is a digital output and input on DV cameras to allow for digital videotape cloning with no generation loss. Firewire was originally used to transfer data between mainframes without reformatting. There is increasing interest from broadcasters to use Firewire to transport A/V data, such as MPEG-2.

I/O _ *Input/output* - Refers to the flow of information or signals (in or out) with respect to a particular device Input may be camera, tape, disk, video, scanner, and output may be tape, disk, CD ROM, film recorder, printer, plotter, or imagesetter.

IA-64 _ *Intel Architecture-64* - The 64-bit architecture used in Intel's next-generation family of CPU chips. It is designed for fast parallel instruction execution and was designed at the end of the 20th century, whereas x86 chips (IA-32) hark back to the early 1970s when designs were based on a fraction of the number of transistors that can be built into a chip today. Although x86-based software (IA-32 software) will run intact on IA-64 machines, programs have to be recompiled in order to take full advantage of the new architecture. The IA-64 architecture differs from IA-32 in several ways. Rather than variable-length instructions, it uses fixed-length, four-byte instructions bundled in sets of three "long instruction words."

IBM _ *International Business Machines Corporation* - The world's largest computer company. IBM's product lines include the S/390 mainframes (zSeries), AS/400 mid-range business systems (iSeries), RS/6000 workstations and servers (pSeries), Intel-based servers (xSeries) as well as desktop PCs and notebook computers. All of its product families have been very successful. It all started in New York in 1911 when the Computing-Tabulating-Recording Company (CTR) was created by a merger of The Tabulating Machine Company (Hollerith's punch card company in Washington, DC), International Time Recording Company (time clock maker in NY state), Computing Scale Company (maker of scales and food slicers in Dayton,

Ohio), and Bundy Manufacturing (time clock maker in Auburn, NY). In 1914, Thomas J. Watson, Sr., became general manager. During the next 10 years, he dispensed with all non-tabulating business and turned it into an international enterprise renamed IBM in 1924. IBM achieved spectacular success with its tabulating machines and the punch cards that were fed them. IBM launched its computer business in 1953 with the 701 and introduced the 650 a year later. By the end of the 1950s, the 650 was the most widely used computer in the world with 1,800 systems installed. The 1401, announced in 1959, was its second computer winner; and by the mid-1960s, an estimated 18,000 were in use. In 1964, it announced the System/360, the first family of compatible computers ever developed. During the 1970s and 1980s, IBM made a variety of incompatible minicomputer systems, including the System/36 and System/38. Its highly successful AS/400, introduced in 1988 and renamed the "iSeries" in 2000, provides a broad family of compatible machines in this segment. In 1981, IBM introduced the PC into a chaotic personal computer field and set the standard almost overnight. Like everyone else, IBM includes the Windows operating system on its PCs. In the mid 1990s, it tried to compete with its OS/2 operating system. Although it has been highly praised and is still offered for desktop and server use, OS/2 never gained significant market share. The early 1990s were gut-wrenching years for IBM. It experienced major losses for the first time due mainly to slowing sales of high-profit mainframes as companies embraced PCs and small servers by the millions. As a result, IBM reduced its workforce by more than 100,000. In 1991, IBM teamed up with Apple and Motorola to produce the PowerPC chip, a single-chip version of IBM's RS/6000 workstations. Introduced in 1995, the PowerPC systems had little impact as stand-alone PCs, but the chips breathed new life into IBM's RS/6000 and AS/400 lines. In the late 1990s, IBM embraced the Linux operating system and supports it on all of its product lines. This is a major shift for a company that is known for proprietary software for half a century. IBM sells an enormous amount of hardware, including workstations, servers, desktop and laptop PCs and its venerable mainframes.

IBOC _ *In-Band On-Channel* - A proposed technology for digital radio in the United States. Digital radio is also being referred to as "Digital Audio Broadcasting" or DAB. IBOC allows digital information to be transmitted simultaneously with existing analog broadcast in the same frequency bands that are currently assigned to AM and FM broadcast stations.

IC _ *Integrated Circuit* - Many transistors and other circuit elements "integrated" on a single silicon chip

ICC Profile _ The ***International Color Consortium*** - a group that sets standard guidelines for color management in the imaging world. Most printers, monitors and scanners as well as digital cameras, usually come with a driver disc for Windows and Mac systems that includes ICC profiles for the particular device. Color profiles simply let one piece of hardware or software "know" how another device or image created its colors and how they should be interpreted or reproduced.

ICIA _ *International Communications Industries Association* - The official association of the A/V, video and multimedia industry. Formerly National Audio Visual Association (NAVA).

ICMP _ *Internet Control Message Protocol* The part of the Internet Protocol that handles the error and control messages data link layer. The second layer of the Open Systems Interconnect (OSI) communications model. It puts messages together and co-ordinates their flow.

Icon _ a) A picture or symbol displayed in the form of a graphic image on pop-down menus, toolbars or on your desktop, etc to identify and activate (if clicked on) an application, computer program, command, file or event, etc. **_ b)** Established in 1993 by eight industry vendors for the purpose of creating, promoting and encouraging the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture and components.

ICWK _ *Internal computer wiring kit* - Custom ICWK kits provide interfacing signals for computers and terminals that have no video display output connector. Internal video signals are routed from the terminal, usually out to a 9-pin connector. From the 9-pin connector, a short cable is included with the kit to connect that signal to the input of an interface.

ID3 _ The data fields reserved in an MP3 file that hold the artist's name as well as song and album titles, allowing MP3 players to use this data when searching or playing. Also known as an "ID3 tag," this simple feature is missing in a standard CD, which many believe was the most glaring oversight in the design of the digital audio CD. As engineers were developing the CD in the late 1970s, it would have been simple to reserve a couple thousand bytes out of the 650 million to save this obviously useful data.

IDE _ a) Integrated Drive Electronics - A type of hardware interface widely used to connect hard disks, CD-ROMs and tape drives to a PC. IDE is very popular because it is an economical way to connect peripherals. Starting out with 40MB capacities years ago, 20GB IDE hard disks have become entry level, costing less than half a cent per megabyte**. _ b) *Integrated Development Environment*** A set of programs run from a single user interface. For example, programming languages often include a text editor, compiler and debugger, which are all activated and function from a common menu.

Identifier _ Name or number given to a clip or segment of a video to allow for easy recognition of the segment and its contents.

IDTV _ *Integrated Digital TV* receiver. For viewers to receive DTV services they require a receiver either in the form of a new television set (IDTV) or a set top box. A TV set which has the digital decoder already built in (hence "integrated") has "DVB" marked on them for "Digital Video Broadcasting".

IDTV _ *Increased definition television* - Example - scan doubling or scan quadrupling.

IEC _ *International Electro - technical Commission* - The body that has responsibility for developing international A/V standards. ICIA cooperates with IEC sub-committee SC-60.

IEEE _ *Institute of Electrical & Electronics Engineers* - It promotes the engineering process creating, developing, integrating, sharing, and applying knowledge about electrical and information technologies and sciences for the benefit of humanity and the profession. One of its standards in common use in the digital video world in the IEEE 1394 "Firewire" digital interface.

IEEE 1394 _ Exact the same thing as Fire-Wire, just a different name.

IFO _ In video editing, IFO normally refers to a file on DVD-Video disc and stands for Information. While the main content of DVD-Video disc are the VOB files which contain the actual MPEG-2 audio, video and subtitle streams, the IFO files provide information for DVD player where DVD-Video disc's chapters start, where certain audio tracks are located, etc..

I-frame (Intra-frame) _ A frame created during the MPEG or MPEG-2 compression process that contains all the information required to reproduce a complete image. It allows random access points within a video stream, and acts as a reference point for B-frames and P-frames to be built. I-frames are editable because they contain enough data to construct an entire video frame, unlike B-frames or P-frames.

I-frame only (aka I-only) _ A video compression scheme in which each frame is intra-frame compressed, i.e. each frame is individually defined and does not depend on any others. There are no P (predictive) or B (bi-directional) frames in the compression scheme. This is considered preferable for studio use so that edits can be made on any frame boundaries without necessarily involving processing. All DV compression is I-frame only. Unless stated as I-frame only, MPEG-2 uses GOPs longer than one. 50 Mb/s data rate with I-frame only compression is considered suitable for studio SD operations. The equivalent for HD would be 300 Mb/s.

ILA _ *Image light amplifier* - Used in their large screen projectors, a Hughes/JVC device that uses low-intensity images to modulate high intensity light through a liquid crystal layer. The technology has been used up to cinema screen size to show "digital movies".

Illegal Colors _ Computer-based systems can generate colors that cannot be video-processed due to technical restrictions (they are located outside the color space defined for video). Those creating graphics including increasingly saturated red with a high luminance ratio will notice during video processing that this color cannot be displayed or is displayed in an altered or distorted way due to color bandwidth limitations. Several paint and editing systems therefore include a function by means of which these illegal colors can be either displayed and excluded.

Image _ The visual representation of illustrations, photos, pretty much anything graphic in nature.

Image Buffer _ For all practical purposes, an image buffer is the same as a frame buffer. An image is acquired and stored in the image buffer. Once it is in the image buffer, it can typically be annotated with text or graphics or manipulated in some way, just like anything else in a frame buffer.

Image Capacity _ The number of images that can be taken before the storage medium needs to be replaced.

Image Capture _ The use of a device, such as a scanner or digital camera, to create a digital representation of an image. This digital representation can then be stored and manipulated on a computer.

Image Compression _ Image compression is used to reduce the amount of memory required to store an image. For example, an image that has a resolution of 640 x 480 and is in the RGB color space at 8 bits per color, requiring 900 KB of storage. If this image can be compressed at a compression ratio of 20:1, then the amount of storage required is only 45 KB. There are several methods of image compression, but the most popular are JPEG and MPEG. However, compression often causes a reduction in picture quality.

Image Data Format _ A specification for storing image data and related information in a digital file. One example is TIFF, tag image file format, which can be used to store various types of monochrome or color bit-mapped images.

Image Editing Software _ Software that allows one to adjust the color, contrast, sharpness, size, or other characteristics of a digital image. The resulting images can then be saved in all sorts of different file formats with several variations of each file format being available to an advanced user.

Image Enhancer _ A television signal processor that creates a sharper picture by increasing luma detail without increasing the resolution.

Image Filter _ A routine that changes the appearance of an image or part of an image by altering the shades and colors of the pixels in some manner. Filters are used to increase brightness and contrast as well as to add a wide variety of textures, tones and special effects to a picture.

Image Map _ An image with clickable "hot spots" which allow several hyperlinks from a single image file. An example would be an image of a country, split into different areas, each of which could be clickable and hyperlinked to a larger view of that specific area.

Image Pac _ Image Pac is a proprietary file format designed specifically for storing photographic quality images on CD. It is now used in numerous pre-press, scientific and commercial applications

Image Processing _ Capturing and manipulating images that have been scanned or captured by a digital recording device, in order to enhance or extract information.

Image Resolution _ The number of pixels per unit length of image. For example, pixels per inch, pixels per millimeter, or pixels wide.

Image Scaler _ The circuit that translates the image resolution coming from the display adapter (video card) into the maximum resolution of the display screen or flat panel. This is how different resolutions (640x480, 800x600, etc.) fill up the entire width and height of the screen.

Image Sensor _ A traditional camera exposes a piece of light-sensitive film, digital cameras use an electronic image sensor to gather the image data.

Image Size _ Describes the actual physical dimensions of an image, not the size it appears on a given display device.

Image Stabilization _ An optical or digital system for compensating for camera movements, specially in telephoto zoom lenses.

Imaging _ Listening term. The ability of a speaker to position sounds precisely in space. A good stereo system can provide a stereo image that has width, depth and height. The best imaging systems will define a nearly holographic recreation of the original sound.

IMAX _ An entertainment technology company, with particular emphasis on film and digital imaging technologies. IMAX is involved in the design, leasing, marketing, maintenance, and operation of IMAX theatre systems to film development, production, post-production and distribution of large-format films. Experimentation in HD as an acquisition format for IMAX is ongoing, along with Digital Cinema electronic projection systems.

Immediate Mode _ A rendering mode in which the graphics system processes each drawing command as soon as it receives it.

Impedance-matching _ Circuits that generate audio or video signals are designed to work with a certain "load" (impedance). When connecting devices in a system, it is important that the impedance specifications are adhered to. If the impedance of the load is not matched to that of the source, there could be undesirable results, such as loss or distortion of the original signal, reflections, etcetera.

Implantable ID Chip _ A chip that contains a unique number used for identification purposes that is embedded under the skin of animals and humans. In the 1990s, the technology became popular for animals in zoos, but in 2001, the first commercial chip for people was introduced.

Import _ The process of bringing data into a document from another computer, program, type of file format, or device.

Import Filter _ The function in a program that reads a non-native file format. In some applications, you have to specify the file type before you can select the file by name. Others let you open the file by name and will use the appropriate import filter automatically.

Improved Definition Television _ IDTV is different from HDTV. IDTV is a system that improves the display on TVs by adding processing in the TV; standard NTSC or PAL signals are transmitted.

IMUX _ *Inverse multiplexer* - A unit that combines multiple, low bandwidth digital phone lines into a single, high bandwidth call.

In and Out points _ The points in a source clip at which the material actually used in a video program begins (In point) and ends (Out point).

In the Wild _ Refers to viruses that have been not contained. Although tens of thousands of viruses have been unleashed, most of them have been eradicated and exist only in computer labs for research purposes. However, at any given time, there may be a couple hundred viruses that are still "in the wild" contaminating computer systems of unsuspecting users.

In-betweening _ In animation, the process of adding frames between keyframes to produce smooth motion. Also known as tweening.

Indeo _ A video compression/decompression algorithm from Intel that is used to compress movie files.

Index Pulse Signal _ A digital pulse signal indicating the beginning of a disk revolution. An embedded servo pattern or other prerecorded information is present on the disk following index.

Indexed Color _ Reduced Color mapping, 8 bit or less. Done to reduce images to their smallest size. Commonly used for images placed on home pages of the Internet. The 256 color palette are also mapped for best results on the Internet, taking into account the differences between the Windows and Macintosh color palettes.

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

Inductor _ An electrical component that opposes changes in current flow and stores electrical energy as a magnetic field. Although all wires have inductive properties, an inductor component is usually a coil of wire. Transformers use this same principle.

Infographer _ newly coined name for the people working with digital (aka. informatic) equipment.

InfoLITHIUM _ Sony's "smart" lithium rechargeable battery pack. It has a chip inside that tells the camera how long (in minutes) it will last at the current discharge rate.

Infonesia _ *Information amnesia* - Forgetting the source of some information. The single biggest problem of the information age is "too much information" from mail, e-mail, newspapers, magazines, radio, TV and the Web. Internesia (Internet amnesia) is the Internet-only version of infonesia, when you forget the address of the Web site that had something of interest to you.

Information _ Information is the summarization of data. Technically, data are raw facts and figures that are processed into information, such as summaries and totals. But since information can also be the raw data for the next job or person, the two terms cannot be precisely defined, and both are used interchangeably. It may be helpful to view information the way it is structured and used, namely: data, text, spreadsheets, pictures, voice and video. Data are discretely defined fields. Text is a collection of words. Spreadsheets are data in matrix (row and column) form. Pictures are lists of vectors or frames of bits. Voice is a continuous stream of sound waves. Video is a sequence of image frames.

Information Overload _ A symptom of the high-tech age, which is too much information for one human being to absorb in an expanding world of people and technology. It comes from all sources including TV, newspapers, magazines and the Internet as well as wanted and unwanted mail, e-mail and faxes. It also includes the excessively intricate and mostly indecipherable manuals that must be read to operate everything from a handheld device to a software application. It boils down to this: the volume of information that crossed our brains in one week at the end of the 20th century is more than a person received in a lifetime at the beginning of it.

Information Processing Cycle _ The sequence of events in processing information, which includes (1) input, (2) processing, (3) storage and (4) output. The input stage can be further broken down into acquisition, data entry and validation. The output stage can also be further divided into interactive queries and routine reports. A fifth stage is often attributed to this cycle, which is the archiving or deletion of unwanted data.

Information Superhighway _ A proposed high-speed communications system that was touted by the Clinton/Gore administration to enhance education in America in the 21st century. Its purpose was to help all citizens regardless of their income level. The Internet was originally cited as a model for this superhighway; however, with the explosion of the World Wide Web, the Internet became the information superhighway whether it was ready for it or not.

Information Visualization _ Representing data in 3-D images in order to navigate through it more quickly and access it in a more natural manner. Although the term was coined at Xerox's Palo Alto Research Center, which has developed very advanced techniques, multidimensional cubes, or pivot tables, are a simpler form of information visualization that is widely used today.

Infrared Control _ A wireless medium of remote control, which sends signals to a device via pulses, transmitted in the infrared light spectrum. Its use is restricted to equipment within line-of-sight or reflections off a wall or ceiling. This is sometimes called "IR remote".

Infrared Port _ An infrared port allows data to be transmitted between two infrared devices using light waves instead of cables. Used to connect computers or control devices.

Initiator _ A device in control of the SCSI bus that sends commands to a target. Most SCSI devices have a fixed role as an initiator or a target; however, some devices can assume both roles.

Inkjet _ A type of printer that sprays dots of ink onto paper to create the image. The ink colors are usually CMYK, with some low-end printers having only CMY. Modern inkjet printers now have resolutions of up to 2880dpi and create true photo-quality prints.

Inlay _ Window within a software interface in which a video signal is displayed.

Input _ a) A source for data or a signal to be used by another device. The physical connector or port for entering such a signal or data is called the "input". **_ b)** Media such as cameras and scanners used to convert images to digital data for transferring to a workstation. Also storage media, tape, and discs, can be classified as input devices.

Insert Edit _ An edit in which a series of frames is added, lengthening the duration of the overall program.

Insertion Cursor _ Double triangles that appear on the FX tracks showing where a filter will be inserted.

Install _ When you copy an application or program onto the hard drive of your computer you are installing it. This may be done from a CD-Rom, a Floppy Disk, from the Internet (as a downloaded program et_ c) or from an external device such as a Digital Camera.

Instruction Set _ The repertoire of machine language instructions that a computer can follow (from a handful to several hundred). It is a major architectural component and is either built into the CPU or into microcode. Instructions are generally from one to four bytes long.

Integer _ A whole number. In programming, sending the number 123.898 to an integer function would return 123.

Integer Arithmetic _ Arithmetic without fractions. A computer performing integer arithmetic ignores any fractions that are derived. For example, 8 divided by 3 would yield the whole number 2.

Integrated Circuit _ is the formal name for a die, or chip. Its name resulted from the integration of previously separate transistors, resistors and capacitors, all on a single chip. In 1958, TI inventor Jack Kilby demonstrated the first electronic circuit in which more than one transistor was fabricated on a single piece of semiconductor material. It was about half the size of a paper clip

Integrated HDTV _ A TV set with a built-in digital receiver that can show high-definition broadcasts in true high-definition resolution.

Integrated System _ Single system which contains more or less enough tools to complete a whole area of operation. In many cases this has only become possible through digital technology and, in turn, it can make it very cost effective.

Intel Chipsets _ A set of chips that provides the interfaces between all of the Pac's subsystems. It provides the buses and electronics to allow the CPU, memory and input/output devices to interact. Most Intel chipsets, which are contained on two to four chips, also include built-in EIDE support. In the past, Intel used the name "Triton" for its chipsets. It also used the name PCIset for PCI-based chipsets.

Intelligent Network _ is a switching and signaling concept that centralizes a great deal of intelligence in databases and applications processors in the network instead of in the central switching office devices. This will enable the network to process complex instructions about routing, signaling and information structure quickly and accurately.

IntelliSense _ Features in Microsoft applications that help the user by making decisions automatically. By analyzing activity patterns, the software can derive the next step without the user having to explicitly state it. Automatic typo correction and suggesting shortcuts also fall under the IntelliSense umbrella.

Intensity _ This is the same thing as **brightness**.

Interactive _ to interact is to act together, interactive means acting together. Interactive software gets the user involved in what is going on: the user can make things happen, and the program can react differently to the user depending on what the user has done.

Interactive Fiction _ An adventure game that has been created or modified for the computer. It has multiple story lines, environments and endings, all of which are determined by choices the player makes at various times.

Interactive Games _ generic term used for video games and computer games.

Interactive Multimedia _ graphics and video signals played from a CD, DVD, or over the internet, that allow the viewer to respond directly to questions or options.

Interactive Television _ A combination of television with interactive content and enhancements. Interactive television provides better, richer entertainment and information, blending traditional TV-watching with the interactivity of a personal computer. Programming can include richer graphics, one-click access to Web sites through TV Crossover Links, electronic mail and chats, and online commerce through a back channel. A service generally enabled by DTV.

Interactive Video _ The fusion of video and computer technology. A video program and a computer program running in tandem under the control of the user.

Interactive Video Disc _ There are three basic levels of interactivity. Level 1 programs - interactivity is manual, via the player's remote control. Level 2 discs incorporate a separate interactive program on the disc itself. Each time the disc is placed in a special Level 2 player, the programming information from the videodisc is loaded into the player's memory. Level 3 has an outboard program to run the disc. The standard consumer DVD has its own built in program running the disc. In laserdisc terms, all DVD's would at least qualify as Level 2 discs.

Intercast _ Broadcasting Web pages and other information via TV, using the unused portion of the video signal known as the vertical blanking interval (VBI). Developed by Intel, Intercast data are transmitted in 10 of the 45 lines of the VBI and can provide up to 10.5KBytes/sec of data. Requirements are a TV channel that transmits Intercast data and an Intercast-compliant TV board for the PC or set-top box for the TV.

Interesting Time _ A place in a video program where an editorial event occurs, such as the beginning of a filter or transition, new clip, or key frame.

Interface _ A device or module that operates as a link between dissimilar modules, usually because those modules cannot communicate directly with each other. An interface may act as a translator or interpreter, and could be in the form of hardware and/or software. Hardware interfaces are the plugs, sockets, wires and the electrical pulses traveling through them in a particular pattern. Software, or programming, interfaces are the languages, codes and messages programs use to communicate with each other and to the hardware. A video interface allows computer-video signals to be used by large screen video displays. User interfaces are the keyboards, mice, commands and menus used for communication between you and the computer.

Interface Card _ A special card that slots into a Notebook or Desktop PC which then allows the user to connect to an office network.

Inter-Frame Compression _ Also known as *temporal compression,* inter-frame compression reduces the amount of video information by storing only the *differences* between a frame and those that precede it. Inter-frame compression treats all the frames in the sequence as an interdependent group. As a result, most of the frames can't be edited independently. . MPEG-2 uses two types of inter-frame processed pictures - the "P" (predictive) and "B" (bi-directional) frames.

Interlace _ Method of smoothening the video picture moving by having double the amount of frames than the video's fps value suggests. Basically, how the interlacing is done, let's say in PAL format, is that each frame is split into two separate pictures, which both are missing half of the picture information. The split is done by its horizontal lines. The PAL video contains 576 horizontal lines - let's say that the numbering of these lines begins from the top of the frame being the line number 1. The frame is being split to *half-frame A* and *half-frame B* - the half-frame A would contain lines 1, 3, 5, 7, ... and the half-frame B would contain horizontal lines 2, 4, 6, 8, 10, ... So, when the video is shown with PAL that has frame frequency *(fps)* of 25fps, there are 50 "half frames" per second that are being updated. First comes the first full frame's "half A" that fills horizontal lines 1, 3, 5, .. leaving other ones blank (assuming that we start from a "zero state" that output doesn't have anything shown before we start counting this). Then comes first full frame's "half B" that fills the missing lines 2, 4, 6, ... and leaves the existing "half A"'s lines showing as well - now we have the frame no.1 fully shown on screen. Then comes frame no.2"s "half A" that then wipes off the frame no.1"s "half A", but leaves the frame no.1"s "half B" showing. So, now we have a mixture where lines 1, 3, 5, 7, .. are being filled by frame no.2 and lines 2, 4, 6, .. are being filled by frame no.1.

Interlace Factor _ The reduction in vertical definition during vertical image movement due to interlaced (rather than progressive) scans. Typically this is assumed to be 30%, and is in addition to the Kell Factor (another 30% reduction), making an overall reduction of 50%.

Interlace Scan _ A process in which the picture is split into two fields by sending all the odd numbered lines to field one and all the even numbered lines to field two. This was necessary in the early days of TV when there was not enough bandwidth to send a complete frame fast enough to create a non-flickering image. For analogue systems, this is the reason for having odd numbers of lines in a picture e.g. 525 and 625, so that each field contains a half-line, causing the constant vertical scan to place the lines of one field between those of the other. The technique improves the portrayal of motion and reduces picture flicker without having to increase the picture rate (and therefore the bandwidth/data rate). Disadvantages are that it reduces vertical definition of moving images to about 70% of the progressive scan definition and tends to cause horizontal picture detail to "dither". There is continuing debate about the use of interlaced and progressive scans for DTV formats.

Interlaced GIF _ A GIF image that comes into focus while it is being displayed. Instead of rendering the image a line at a time, the whole frame is displayed looking very pixelated somewhat like a Venetian blind and gradually becomes sharper as the lines fill in. It gives the illusion that the whole page has been downloaded faster even though you have to wait the same amount of time for the GIFs to become sharp. The interlaced GIF is created in four passes (scans): every eighth row starting with row 0, every eighth row starting with row 4, every fourth row starting with row 2 and every second row starting with row 1.

Interleave_ To arrange data in alternating chunks so that selected parts can be extracted while other parts are skipped, or so that each chunk carries a piece of a different data stream. In some codecs (such as AVI) used so that audio and video data alternate. In DVD, interleaving is used for seamless multiangle and director's cut features, in which multiplexed streams are subsequently interleaved to allow seamless playback of alternate program material.

Interleaving _ The process of assigning consecutive physical memory addresses alternately between two memory controllers in order to increase the effective transfer rate.

Interline Sensor _ A type of image sensor consisting of a two-dimensional array containing light-sensitive photoelements adjacent to light-shielded vertical storage registers.

Intermediate Language _ A language that is generated from a programming source language, but cannot be directly executed by the CPU. The intermediate language, also called "bytecode," "p-code," "pseudo code" or "pseudo language," must be either interpreted a line at a time or compiled into machine language and then run. This method allows the same source language to generate applications for different computer platforms. Each platform would use its own runtime software to execute the same intermediate language.

Intermodulation Distortion _ A form of distortion that introduces frequencies not present in the original signal. These are invariably based on the sum and difference products of the original frequencies.

Internet _ Internet is made up of computers in more than 100 countries covering commercial, academic and government endeavors. Originally developed for the U.S. military, the Internet became widely used for academic and commercial research. Users had access to unpublished data and journals on a huge variety of subjects. Today, the Internet has become commercialized into a worldwide information highway, providing information on every subject known to humankind. The Internet's surge in growth in the latter half of the 1990s was twofold. As the major online services connected to the Internet for e-mail exchange, the Internet began to function as a central gateway. A member of one service could finally send mail to a member of another. The Internet glued the world together for electronic mail, and today, the Internet mail protocol is the world standard. Secondly, with the advent of graphics-based Web browsers, the World Wide Web took off. The Web became easily available to users with PCs and Macs rather than only scientists and hackers at UNIX workstations. Delphi was the first proprietary online service to offer Web access, and all the rest followed. At the same time, new Internet service providers rose out of the woodwork to offer access to individuals

and companies. As a result, the Web has grown exponentially providing an information exchange of unprecedented proportion. The Web has also become "the" storehouse for drivers, updates and demos that are downloaded via the browser. Although daily news and information is now available on countless Web sites, long before the Web, information on a myriad of subjects was exchanged via Usenet (User Network) newsgroups. Still thriving, newsgroup articles can be selected and read directly from your Web browser. Chat rooms provide another popular Internet service. Internet Relay Chat (IRC) offers multiuser text conferencing on diverse topics. Dozens of IRC servers provide hundreds of channels that anyone can log onto and participate in via the keyboard..

Internet Appliance _ Also called "information appliance," "smart appliance," and "Web appliance," it is a device specialized for accessing the Web and/or e-mail. Designed for ease of use, it plugs into a telephone jack or LAN connection for Internet hookup. Portable Internet appliances use a wireless connection to the Internet. Devices for Internet TV services such as MSN TV are sometimes called Internet appliances as well. The term is rather encompassing, and innovative products are expected all the time.

Internet Cafe _ The high-tech equivalent of the coffee house. However, instead of playing chess or having heated political discussions, you browse the Internet and discuss the latest technology. CD-ROMs, games and other "cyber stuff" are also generally available. They started in Europe, and the CYBERCAFE was the first in the U.S.

Internet Domain Name _ An organization's unique name on the Internet. As of early 2001, there were more than 20 million registered domain names. The name chosen by the organization combined with a top level domain (TLD) makes up the Internet domain name. The .com is the most desired because all major U.S. corporations adopted it early on, and it became trendy. The .com, .net and .org TLDs are not restricted. If a .com name is already taken, a .net or .org TLD is often chosen instead. Here is the list of domain names **.com** - commercial; **.edu -** educational; **.gov -** governmental; **.int** - international; **.mil** - military; **.net -** network; **.org -** organization; **.aero -** aerospace; **.biz -** business; **.coop -** cooperative; **.info** - information service; **.museum** - museum; **.name** individual/personal; **.pro -**professional.

Internet E-mail Service _ There are two ways to get e-mail over the Internet. One is by using a mail program that is installed in your computer, and the other is a mail service on the Web, which is accessible from any browser.

Internet Protocols _ Refers to all the standards that keep the Internet running. The foundation protocol is TCP/IP, which provides the basic communications mechanism as well as ways to copy files (FTP) and send e-mail (SMTP). The Web added the HTTP protocol for downloading Web pages and HTML, XML and XHTML for formatting them. There are many others and many more are expected, as the Internet has become "the" arena for global standards.

Internet Radio _ Unlike regular AM and FM radio broadcasting, which is limited by official bodies which controlling frequencies and power ranges, all that is required to broadcast on the Internet is streaming audio software and space on an Internet server. This freedom has allowed thousands of stations to spring up in cyberspace. The entire range of musical and talk genres are well represented on the Internet.

Internet Roaming _ Accessing your own ISP locally when traveling abroad. Organizations such as GRIC and iPass have alliances with ISPs around the world that enable international travelers to obtain their e-mail without making long distance calls.

Internet Service Provider _ An organization that provides access to the Internet. Small Internet service providers (ISPs) provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.). Customers are generally billed a fixed rate per month, but other charges may apply. For a fee, a Web site can be created and maintained on the ISP's server, allowing the smaller organization to have a presence on the Web with its own domain name.

Internet TV _ An Internet service for home TV use. It uses a set-top box that connects the TV to a modem and telephone line. The user interface has been specialized for viewing on an interlaced TV screen rather than a computer monitor. WebTV (later MSN TV) was the first such service to obtain widespread distribution.

Interoperability _ The ability of systems to interoperate - to understand and work with information passed from one to another. Applied to television this means video, audio and metadata from one system can be used directly by another. Digital signals may be originated in various formats and subjected to different types of compression so care is needed to maintain interoperability. For example, interoperability would be required for a Digital Television set to be plugged into a VCR that is plugged into cable with all the components working together

Interpolated - Software programs can enlarge image resolution beyond the actual resolution by adding extra pixels using complex mathematic calculations. It is important to note that interpolation doesn't add any new information to the image - it just makes it bigger! Interpolation is used in graphics to describe the process of upscaling graphics. Editing and compositing systems make use of interpolation to design movement effects. It's also used in animation to describe the process of tweening. Distorted images caused by aliasing can also be partially reduced by interpolation.

Interpolation (spatial) _ Defining the value of a pixel from those of its near neighbors. When repositioning or re-sizing a digital image for dramatic effect or to change picture format more, less or different pixels are required from those in the original image. Simply replicating or removing pixels causes unwanted artifacts. For far better results the new pixels have to be interpolated - calculated by making suitably weighted averages of adjacent pixels - to produce a more transparent result. The quality of the results will depend on the techniques used and the number of pixels points (hence 16-point interpolation), or area of original picture, used to calculate the result.

Interpolation (temporal) _ Interpolation between the same point in space on successive frames. It can be used to provide motion smoothing and is extensively used in standards converters to reduce the judder caused by the 50/60 Hz field rate difference. The technique can also be adapted to create frame averaging for special effects.

Interrupt _ A signal sent by a subsystem to the CPU that signifies a process has either completed or could not be completed.

Intraframe Coding _ Video coding within a frame of a video signal.

Intra-frame Compression _ Compression that occurs within one frame. The compression process only removes redundant information from within the frame itself. No account is taken of other frames. Motion-JPEG, DV and the "I" frames of MPEG-2 are coded in this way and use DCT. In the MPEG-2 sequence only I-frames can be edited as they are the only independent frames. Also known as *spatial compression.*

Intranet _ An in-house Web site that serves the employees of the enterprise. Although intranet pages may link to the Internet, an intranet is not a site accessed by the general public. Intranets use the same communications protocols and hypertext links as the Web and thus provide a standard way of disseminating information internally and extending the application worldwide at the same time.

Intranet Toaster _ A self-contained intranet server designed for small departments or businesses. It plugs into the network and is configured via the Web browser. It is not as powerful as a full-blown UNIX or NT server, but provides for a convenient and fast installation.

Inverse _ To select everything in an image except the original selection.

Inverse Kinematics _ A technique used to produce realistic movement. In a parent/child hierarchy, moving one child object at the end of a chain automatically calculates the movements up through the parent object. It allows elements of an object to be linked, such as the parts of an arm or leg, and causes them to move in a prescribed, realistic manner.

Inverse Telecine _ Process where video editing tools reverse telecine process. Basically inverse telecine *(or IVTC as it is also called)* brings back movie's original frame rate from NTSC's 29.97fps to 24fps.

Invisible GIF _ A tiny GIF file comprised of a single, transparent pixel. Also known as a "1-by-1 GIF" or "clear GIF," it is used to monitor a user's activity.

IP _ *Internet Protocol*, the basis of most Internet protocols, breaks up large chunks of information into digestible *packets*. In addition to the data being conveyed, each packet (also known as a *datagram*) carries a header containing the source and destination *IP addresses*, as well as a sequence number that allows the destination computer to reconstruct the packets in the correct sequence, when they arrive.

IP address _ A numeric identifier for a computer or device on the Internet. An IP address consists of four numbers separated by periods, or dots (e.g., 192.168.0.1), representing a unique 32-bit address. An IP address consists of a network portion and a host portion; how many bits designate the network and how many designate the host varies.

IR (Infrared) _ a) Light waves just outside the visible spectrum; that is, waves with a wavelength slightly longer than those visible to the human eye. Infrared light is sometimes filtered out to reduce heat on film or slides. **_ b)** Use of an invisible (to humans) beam of light to either wirelessly control a device or as a method of transferring data from one device to another without cables.

IRC _ *Internet Relay Chat* - A world wide electronic chat program that allows the user to communicate with other people across the globe and have public or private conversations using typed messages and by using their name, or more often a "guest" name.

IrDA _ The ***Infrared Data Association*** - which sets standards for using infrared transmission to transfer data between electronic devices through the air, with no cables or wires. A TV wireless remote uses infrared transmission.

IRE _ a) *Institute of Radio Engineers* Formerly called IEEE. **_ b)** Scale of values ranging from 0 to 100 that defines the brightness level of an analog broadcast video signal. The spectrum of low-to-high IRE values describes increasing brightness levels in a video signal.

IRQ _ Settings that determine the memory addresses and processor usage for computer add-on cards. Never interfere with IRQ settings unless you are an experienced computer buff!

Irrelevancy _ The part of a signal that is not perceptible to the human user under the normal circumstances of use. In other words, irrelevancy is the part of the signal that may be removed at the encoder, and removed at the decoder, with no loss of content.

ISA _ *Industry Standard Architecture* - A 16-bit bus for PCs. These used to be the "Industry Standard" special slots inside your computer for connecting modems, soundcards and other add-ins. They have now been largely replaced by PCI slots but all Pac's must include at least one ISA slot to be compatible with older add-in's.

ISDB _ *Integrated Services Digital Broadcasting* - standard for digital broadcasting used in Japan. ISDB has many similarities to DVB including OFDM modulation and the flexibility to trade signal robustness against delivered data rate for transmission. Within one channel, the hierarchical system allows both robust SD reception for mobile and portable use and less robust HD - a form of graceful degradation.

ISDN _ *Integrated Services Digital Network* - allows voice, video and data to be transmitted at high speed over the public telephone network. ISDN operates from the Basic Rate of 64 kb/sec to the Primary Rate of 2 Mb/s (usually called ISDN-30 as it comprises 30 Basic Rate channels). Most of the western world currently has the capability to install ISDN-2 with 128 kb/sec. In the television and film industries audio facilities are already using it. A TV frame takes 2-3 minutes to transfer at the ISDN Basic Rate.

ISMA _ *Internet Streaming Media Alliance* ISMA is a group of industry leaders in content management, distribution infrastructure and media streaming working together to promote open standards for developing end-to-end media streaming solutions.

ISO _ *International Standards Organization* - An international organization that specifies international standards, including those for networking protocols, compression systems, disks, etc.

Isochronous _ Data transfer method in which data channels provide guaranteed data transport at a pre-determined rate. This is especially important for time-critical Multimedia data where just-in-time delivery eliminates the need for costly buffering.

ISP _ *Internet Service Provider* - The company or organization that is dedicated to providing business or private users access to the Internet. The largest ISP in great Britain is Freeserve with over 2 million users.

ISRC _ *International Standard Recording Code* - A 12-digit code written into the subcode area of an audio CD which holds logging information for each track. The code is made up of the Country Code (2 ASCII characters), Owner Code (3 ASCII characters), Year of Recording (2 digits), and Serial Number (5 digits).

IT _ Acronym for ***Information Technology***. The science of the representation, transmission and processing of information, specifically processing with computers.

ITC _ *Independent Television Commission*
It is responsible as a regulator, both legally and technically, for all independent programming in the United Kingdom, be it cable, satellite or terrestrial.

ITS _ a) The ***International Teleproduction Society _* b)** The Association of ***Imaging Technology and Sound***. A United States association of members, with many from the production and post production industry, dedicated to promoting and furthering the use of video as a medium of communication. It also has a UK chapter.

ITU _ *International Telecommunications Union* - The United Nations regulatory body covering all forms of communication. The ITU sets mandatory standards and regulates the radio frequency spectrum. ITU-R (previously CCIR) deals with radio spectrum management issues and regulation while ITU-T (previously CCITT) deals with telecommunications standardization.

ITVA _ *International Television Association.*

IVI _ Shortly after the introduction of Apple QuickTime, Intel responded with its ***Indeo Video Interactive*** (IVI or Indeo 4.0) codec. This format allows for scaleable software-only video playback. IVI can compress video symmetrically (in real time, larger file size) or asymmetrically (off-line, smaller file size, low data rates, highest quality). Compression times have been dramatically shortened by the new off-line Quick Compressor, which is up to 50 times faster than previous versions. The earlier Indeo 3.1 and 3.2 codecs typically managed 320x240 at 15 fps on Intel 486-based computer, and scaling the window resulted in a pixelated image. The current version is optimized for Pentium processors, resulting in smooth 30 fps playback. Indeo delivers good quality on low-end Pentium-processor computers as well, employing special techniques for graceful scalability. In contrast to QuickTime, which drops frames intentionally to accommodate slower computers, Indeo dynamically varies image quality according to processor power available during playback. The frame rate remains constant - with no dropped frames - instead trading off a degree of detail. Additionally, Indeo's "Alternate Line Zoom-by-Two" doubles window size by horizontal pixel doubling, then drawing a row of black pixels in between each row. This smoothing technique minimizes the pixelation associated with scaling the window. Other innovative features include "Transparency", a compositing effect in which an object can be layered on top of video, just as a TV weatherman stands in front of a blue screen so that his image can be electronically cut and placed on top of a background layer, the weather map. Indeo's sophisticated implementation includes compositing over moving backgrounds, moving objects (sprites) across frames, and more, comprising the "Interactive" features. Indeo is supported by Microsoft VfW and ActiveMovie.

IVUE _ A file format associated with FITS technology that enables images to be opened and displayed in seconds by showing only as much data on the screen as is implied by the screen size and zoom factor.

J

Jaggies _ Slang term for stair-stepping or staircased edges of a raster or vector image appearing where there should be straight-angled lines or smooth curves. This problem can appear when low-resolution files are blown up to large sizes. The smaller the pixels, and the greater their number the less apparent the "jaggies". Also known as pixelization

Jam-Sync _ Abbreviation for the capability of a device to read the timecode from the video tape and to continue writing this timecode in case of further recordings.

Jargon _ language developed around a particular occupation or activity, making little sense to someone who does not share in it! Jargon stops being jargon and starts being real language when you learn what it means.

Java _ This is a Web programming language which supports online multimedia effects such as simple animations, background music, interactive web buttons and continuously updated information within displayed Web pages. Unlike other software, programs written in Java can run on any platform type, so long as they contain a Java Virtual Machine.

Java Applet _ A Java program that is downloaded from the server and run from the browser. The Java Virtual Machine built into the browser is interpreting the instructions.

Java Application _ A Java program that is run stand alone. The Java Virtual Machine in the client or server is interpreting the instructions.

Java Chip _ A CPU chip from Sun that executes Java bytecode natively. It is based on Sun's picoJava architecture and is expected to be used in a wide range of devices from small, handheld appliances to desktop network computers. The picoJava chip contains the core architecture of the Java Virtual Machine and can be built into cellphones and other handheld devices. The microJava chip includes the picoJava core plus memory, I/O and other control functions and is targeted towards controllers, network-based devices and consumer products. The first model was introduced in late 1998. The UltraJava chip is targeted for desktop use and incorporates some of Sun's 3-D graphics processing capabilities used in its UltraSPARC machines.

Java Malicious Code _ Java applets allow web developers to create interactive or dynamic web pages with broader functionality. They are small, portable Java programs embedded into the html code of the pages you see, and can run automatically when the pages are viewed. However, hackers and virus writers who wish to cause mischief may use Java Malicious Code as a means to attack your system. On a modern up to date computer you can alter your web browser's settings so that these applets do not execute and change your security level settings so that they cannot be activated.

Java Platform _ Running Java programs under the Java Virtual Machine (JVM). Java "platform" refers to the running of Java programs versus Java itself, which is a programming language. Java programs are machine independent and run intact on any hardware platform that has a Java interpreter (JVM). This "write once, run anywhere" concept is what makes Java so appealing. Java has its own graphical user interface routines that are normally contained in the operating system. Since only a small OS is required to run the Java interpreter (JVM), Java is closer to its own complete operating environment than other programming languages, hence, "Java, the platform" is often heard.

JavaScript _ A popular scripting language that is widely supported in Web browsers and other Web tools. It adds interactive functions to HTML pages, which are otherwise static, since HTML is a display language, not a programming language. JavaScript is easier to use than Java, but not as powerful and deals mainly with the elements on the Web page. On the client, JavaScript is maintained as source code embedded into an HTML page. On the server, it is compiled into bytecode (intermediate language), similar to Java programs. JavaScript evolved from Netscape's LiveScript language. First released with Navigator 2.0, it was made more compatible with Java. JavaScript does not have the programming overhead of Java, but can be used in conjunction with it. For example, a JavaScript script could be used to display a data entry form and validate the input, while a Java applet or Java servlet more thoroughly processes the information. JavaScript is also used to tie Java applets together.

JBOD _ *just a bunch of drives.*

J-cut _ A type of *split edit* where the audio *In point* is earlier than the video *In point* so that the audio begins to be heard during the previous video clip. Also known as an *audio lead.*

JFIF _ *JPEG File Interchange Format* - A minimal file format which enables JPEG bitstreams to be exchanged between a wide variety of platforms and applications. Also known as EXIF

Jitter _ Small vibrations when displaying video on a screen, a tendency towards lack of synchronization caused by electrical changes. Technically the unexpected (and unwanted) phase shift of digital pulses over a transmission medium. A discrepancy between when a digital edge transition is supposed to occur and when it actually does occur. Think of it as nervous digital, or maybe a digital analogy to wow and flutter.

Jog/Shuttle _ Operating wheel for controlling video (tape) drives. The jog/shuttle wheel enables easy change between playing and winding as well as detailed cross connecting frame per frame. Jog/Shuttle wheels are very common in conventional technology, but are nowadays often available in many non-linear editing systems in the form of separate operating consoles as an optional feature.

Joiner _ A video/avi/mpeg joiner is a small program that takes the names of a number of video files and then it simply joins them into one big and complete film/movie. It is relatively common to see movies for download on the internet which have been split up into smaller bits for you to download one by one; and afterwards you then have to "join" them together into one big movie. The reason for splitting them up into smaller bits is that accounts on webhosts generally don't have enough space for one big movie file.

Joke programs _ Joke programs are ordinary executable programs, but with one difference. They often contain pornographic images which the user of the computer might find offensive.

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

Joy Stick _ A pointing device used to move an object on screen in any direction. It employs a vertical rod mounted on a base with one or two buttons. Joy sticks are used extensively in video games and in some CAD systems.

Joystick Port _ This is a 15-pin (female) socket on the rear panel of your PC that allows you to plug in a joystick, steering wheel or game pad, which is an absolute must if you've only bought it to play games.

JPEG _ *Joint Photographic Experts Group* - However, what people usually mean when they use the term "JPEG" is the image compression standard they developed. JPEG was developed to compress still images, such as photographs, a single video frame, something scanned into the computer, and so forth. Using discrete cosine transform, it provides lossy compression (you lose some data from the original image) with ratios up to 100:1 and higher. It depends on the image, but ratios of 10:1 to 20:1 may provide little noticeable loss. The more the loss can be tolerated, the more the image can be compressed. Compression is achieved by dividing the picture into tiny pixel blocks, which are halved over and over until the ratio is achieved. You can run JPEG at any speed that the application requires. For a still picture database, the algorithm doesn't have to be very fast. If you run JPEG fast enough, you can compress motion video - which means that JPEG would have to run at 50 or 60 fields per second. This is called motion JPEG or M-JPEG. You might want to do this if you were designing a video editing system. Now, M-JPEG running at 60 fields per second is not as efficient as MPEG-2 running at 60 fields per second because MPEG was designed to take advantage of certain aspects of motion video. JPEG is implemented in software and hardware, with the latter providing sufficient speed for real-time, on-the-fly compression. C-Cube Microsystems introduced the first JPEG chip.

JPEG baseline compression coding _ JPEG offers data compression of between two and 100 times and three levels of processing are defined - the baseline, extended and lossless encoding. The baseline coding, overwhelmingly the most common in both the broadcast and computer environments, starts with applying DCT to 8 x 8 pixel blocks of the picture, transforming them into frequency and amplitude data. This itself may not reduce data but then the generally less visible high

frequencies can be divided by a high "quantizing" factor (reducing many to zero), and the more visible low frequencies by a lower factor. The "quantizing" factor can be set according to data size or picture quality requirements - effectively adjusting the compression ratio. The final stage is Huffman coding which is lossless but can further reduce data by about 2:1. Baseline JPEG coding is very similar to the I-frames of MPEG, the main difference being they use slightly different Huffman tables.

JPEG++ _ is an extension to JPEG from that allows picture areas to be selectable for different ratios. For example, the background could be compressed higher than the foreground image.

JPEG2000 _ a new image coding system that uses state-of-the-art compression techniques based on wavelet technology. Its architecture should lend itself to a wide range of uses from portable digital cameras through to advanced pre-press, medical imaging and other key sectors. In the frame of the format, both lossy and lossless compressions as well as static and moving images are supported.

Jukebox _ A storage device for multiple optical disc, and one or more discs drives. It will automatically select or changeover as needed. Also Kodak's term for Photo CD's automated disc library.

Jump Cut _ An instantaneous transition between two scenes that have identical subjects in slightly different screen locations, which makes the subject appear to jump within the screen. If not made intentionally, a cutaway shot remedies the distracting jump appearance.

Jumper _ What you put on when you're cold. Also a physical switch used to change the settings of a computer device. A jumper usually consists of two parts - a bank of metal pins and a cap [or caps] that are usually plastic with a metal lining, that can be fitted over the pins. By doing so an electrical connection can be made between the two pins covered. This jumper is then said to be "closed". Unconnected jumper pins are known as "open".

K _ *Kilo* - An abbreviation for 1,000. A kilobyte is 1,000 bytes. Because numbers used in computer RAM sizes are in binary, the closest number is used. When talking about memory size, etc., the numbers are rounded off (1 Kbyte is really 1,024 bytes).

KB _ Can be used to mean either a keyboard for a computer or more commonly "KB" means a kilobyte of data.

Kbps _ *Kilobits per second* _ a) A description of the ability of a computer to transfer a given amount of data. **_ b)** The speed of the modem inside your computer is measured by the number of data "bits" it is capable of transferring every second.

KDE _ *K Desktop Environment* - A GUI-based user interface for UNIX workstations. It provides a complete desktop environment like Windows and the Mac with its own unique style and features. The source code is freely distributed and is maintained by developers around the world. KDE is also widely used with Linux; for example, Lindows.com uses KDE for its Lindows OS desktop and has changed many of the defaults to make it look more like the Windows desktop, which many people are familiar with.

Keep Case _ Full plastic DVD casing similar to VHS rental cases. This case is preferred by a majority of collectors.

Kell Factor _ The vertical definition of a scanned image is only around 70% (the Kell Factor) of the line count due to scan's inability to show detail occurring between the lines. Note that, for interlaced scans, vertical definition is further reduced by the Interlace Factor to 50% or less during most vertical image movement.

Kelvin _ This is a system or scale used for measuring temperature. Absolute zero is 0 degrees Kelvin or -273 degrees Celsius. The "color" of white light is expressed in terms of degrees Kelvin, the color of light emitted when an ideal object is heated to a particular temperature.

Kernel _ The fundamental part of a program, typically an operating system, that resides in memory at all times and provides the basic services. It is the part of the operating system that is closest to the machine and may activate the hardware directly or interface to another software layer that drives the hardware.

Key _ a) Collective term for different functions enabling partial combination of two video frames to form one new frame. Examples for this are chroma and luma keying. **_ b)** When working with a key function, the key signal has the function of a mask and determines which part of the frame results from which original source is sometimes simply referred to as key.

Key fill _ In key effects, the video signal that is said to "fill the hole" cut in the background video by the key source.

Key Out _ Removing a section of video by making it transparent by creating an alpha channel based on color (Chroma Key) or on brightness (Luma Key).

Keyboard _ Today's accepted term to replace the word typing because keyboard relates to a computer.

Keyboard split _ a setup of a keyboard where different notes trigger different sounds. Also known as zoning.

Keycode _ In the field of film, keycode is synonymous to timecode and serves as a means for numbering the frames in a machine-readable way. A code is applied to the negative stock at the perforations. This code can be read by certain devices and includes, besides the numeration, information such as data regarding manufacturer of the respective material. Furthermore, the keycode is used to reedit the original negative stock more or less automatically (in an ideal case) after non-linear offline-editing based on an EDL.

Keyer _ An electronic circuit that creates a control signal to control a video multiplier based on selective information contained in a video signal.

Keyframe _ a) In animation, a frame that marks the position of an object at a point in time. A series of keyframes show the object at key positions during the course of motion. In-between frames are then made to finish out the movement. **_ b)** A set of parameters defining a point in a transition, e.g. of a DVE effect. For example a keyframe may define a

picture size, position and rotation. Any digital effect must have a minimum of two keyframes, start and finish, although more complex moves will use more - maybe as many as 100. Increasingly, more parameters are becoming "keyframeable", i.e. they can be programmed to transition between two, or more, states. Examples are color correction to made a steady change of color, and keyer settings, perhaps to made an object slowly appear or disappear. _ **c)** In inter-frame video compression, keyframes typically store complete information about the image, while the frames in between may store only the differences between two keyframes.

Keying _ The process of selectively overlaying an area of one picture (or clip) onto another. If the switch between the overlaid and background pictures is simply a hard switch this can lead to jagged edges of the overlaid, or keyed, pictures. They are usually subjected to further processing to give a cleaner, more convincing, result. The whole technology of deriving a key signal and the color corrections applied to image edges, has greatly expanded through the use of digital technology, so that many operations may be used together, e.g. softening the key, color correcting key spill areas, and more.

KeyLink _ a computer-based telecine device which reads Keycode and AatonCode off the film during transfer, burns these codes as windows and/or VITC on the video images, stores all events related to the transfer in a database, and automatically syncs the AatonCoded images to their time-correlated sounds.

Keystone Effect _ In stone buildings, the tapered stone at the top of an arch is the "key" that prevents the arch from falling. Also, it refers to a distorted picture where one edge is not the same dimension as the opposite edge, producing a tapered, or wedge shape. Typically, this results when the image is projected to the screen at an angle.

Keystroke _ The action of pressing a single key, or a combination of keys on the keyboard to complete a task or command.

kHz _ 1000 hertz

Kilobyte _ Kb, or 1.024 bytes of information.

Kinescope _ A film of a videotape.

Kiosk _ A stand-alone computer run system that is used to present multimedia information to multiple users. They are usually placed in high traffic areas where many people can access the information that they provide. They can be either interactive or operate automatically.

Knockout _ A masking technique used to separate an element from the background.

kOhm _ 1000 ohms

L*a*b* Color Model _ Based on the model proposed by the Commission Internationale d'Eclairage (CIE) in 1931 as an international standard for color measurement. It's designed to be device independent; creating consistent color whatever the device (such as monitor, printer, computer, or scanner) used to create or output an image. L*a*b color consists of a luminance or lightness component (L) and two chromatic components - the a component (from green to red) and the b component (from blue to yellow). In 1976, this model was refined and named CIE L*a*b.

LAN _ *Local Area Network -* A communications network that's physically connected by cables and confined to a single office or a single building. It enables a group of computers to exchange files and share peripherals.

LANC _ The protocol defined by Sony for enabling external control of video devices and accessing status information from the device. Also referred to as Control-L.

Land _ A non-indented area on an optical medium such as a CD-ROM or DVD disc.

Landing Zone _ The heads move to this location on the inner portion of the disk when commanded, or when the power has been turned off. User data is not stored in this area of the disk.

Language _ Like human languages, programming languages involve sets of rules and syntax that computers understand, allowing computers to carry out the tasks set by the program. Language can refer to many different types and levels of programming languages, each with particular capabilities and shortfalls.

Laser _ *Light Amplification by the Stimulated Emission of Radiation* - A device that creates a uniform and coherent light that is very different from an ordinary light bulb. Many lasers deliver light in an almost-perfectly parallel beam (collimated) that is very pure, approaching a single wavelength. Laser light can be focused down to a tiny spot as small as a single wavelength. Laser output can be continuous or pulsed and is used in a myriad of applications. Gas lasers are used to cut steel and perform delicate eye surgery, while solid state lasers create the ultra-high-speed, miniscule pulses traveling in optical fibers traversing the backbones of all major communications networks. Light traveling in an optical fiber is impervious to external interference, a constant problem with electrical pulses in copper wire.

Laser Diode _ A semiconductor-based laser used to generate analog signals or digital pulses for transmission through optical fibers. Both laser diodes and LEDs (light-emitting diodes) are used for this purpose, but the laser diode generates a smaller beam that is easier to couple with the smaller core of single mode fibers. Laser diodes are designed to emit light either from their edge or their surface, the latter providing a circular beam that couples better with the round core of the fiber. Laser diodes work on the same principle as the bigger gas lasers. They function as an optical oscillator by stimulating a chain reaction of photon emission inside a tiny chamber. In edge-emitting lasers, the semiconductor waver is cleaved, and the inherent properties of the semiconductor create reflective ends that may or may not be enhanced with additional reflective films. With vertical cavity surface emitting lasers (VCSELs), the reflectivity has to be added. The most common semiconductors used in laser diodes are compounds based on gallium arsenide (750 to 900 nm in the infrared), indium gallium arsenide phosphide (1200 to 1700 nm in the infrared) and gallium nitride (near 400 nm in the blue).

Laser Film Recorder _ A machine for printing on photographic film. Three lasers scan across the film area to produce the image.

Laser Printer _ A printer using laser copier technology to produce high-quality printed material from computer data. The laser charges an electrostatically sensitive drum to accept carbon based toners. The toner is then transferred and fused to paper or transparency material.

Laser Rot _ This is a condition found in a small fraction of laserdiscs. The condition is caused by oxidation in the aluminum layer of the disc. Laserdiscs with this condition cease to play. Experts say it is too early to tell if DVDs will develop laser rot, but steps have been taken to prevent it, such as use of higher-quality materials in the manufacturing of discs.

Laser Scanner _ Lasers provide stable and coherent single color light.

Laserdisc _ During the late 70s there were a number of different video disc systems developed, with the Philips VLP (Video Laser Player) system the most widespread. It was released in the US first, as Discovision, and released more widely (as LaserVision) in 1982. Full bandwidth composite video plus two analog audio tracks were recorded on the original disc format. The 12"discs look like large CDs, but are thicker and heavier. They came in two flavors, the normal Long Play (CLV) discs, used to hold films, playing for 55 minutes a side, while Short Play (CAV) discs, 36 minutes a side, were used for reference material since they allowed all the still-frame and other trick-play features to be used. For CAV discs, the disc spins at a fixed 1500rpm, and each frame takes up one revolution. This allows the machine to perform all kinds of tricks, such as still, reverse play, slow motion etc, as it always knows where the frames are. CLV discs, on the other hand, pack the frames as tightly as possible, so that while one frame takes up the whole of the inner part of the disc, at the outer edge three frames can be fitted in a single revolution. A CLV disc can therefore hold more frames, but must slow down as it plays from the centre out toward the edge. Since the frames can start anywhere, the machine can't do all its tricks with a CLV disc, just a very basic jumping picture search. A smaller 8" disc, known as CDV was also launched in the late 1980s which usually carried one or two video tracks and a couple of audio tracks. The audio could be played on a conventional CD machine, the video track only in a laser disc player! After becoming obsolete by 1986, the 12" format was re-launched in the early nineties, now known as LD / "LaserDisc". It was still analogue video, but had digital sound. Most PAL machines could play the earlier VLP & CDV discs. It was more popular in America and Japan than Europe, but has now been replaced by the generally superior quality of DVD.

Last Play Function _ Automatically bookmarks the position on a DVD disc and remembers the playback setting for up to 16 discs, including screen aspect ratio, selected languages, subtitles and more. Resumes playback at the last scene shown prior to when the player was turned off.

Latency _ a) The delay between requesting and accessing data. For disk drives it refers to delay due to disk rotation. The faster a disk spins the quicker it will be at the position where the required data can start to be read. As disk diameters have decreased so rotational (spindle) speeds have tended to increase but there is still much variation. Modern 31/2-inch drives typically have spindle speeds of between 7,200 and 10,000 revolutions per minute, so one revolution is completed in 8 or 6 ms respectively. This is represented in the disk specification as average latency of 4 or 3 ms. it is reduced to 2 ms in the latest drives operating at 15,000 RPM. **_ b)** In online multiplayer games, latency describes the amount of time it takes data to be sent from the player's machine to the server and back again. Measured in milliseconds, latency is typically the amount of delay the player will encounter between the press of a button and the resulting action onscreen. For instance, if a player's latency is 100 milliseconds, and the player fires a weapon, the weapon won't register as having been fired in the gameworld until one tenth of a second after the button has been pressed. Latency has traditionally been an issue for only PC players to deal with, but as consoles move into the age of the Internet, it will become an increasing problem on that side as well.

Lathing _ Creating a 3D surface by rotating a 2D spline around an axis.

Layer _ In postproduction, in particular in compositing, a term for describing the individual image elements or channels that are supposed to be combined with each other or superimposed on each other and which form a common source image. Some time ago this had to be done in a number of successive copying steps. Modern non-linear editing and compositing systems nowadays offer channels or layers that can be graphically displayed to enable a better overview of the layering. Later changes of a layer are possible with non-linear systems without having to newly carry out all other work steps. Layers may be background video or foreground video with their associated matte run. To be able to link up the different layers, key and mask techniques are used. The ability to compose many layers simultaneously means the result can be seen as it is composed and adjustments made as necessary.

Layer Change _ When a DVD player skips to the next layer of an RSDL disc. This usually triggers a brief pause in the audio and video.

LBA _ *Logical Block Addressing* - A method of addressing the sectors on a drive. Addresses the sectors on the drive as a single group of logical block numbers instead of cylinder, head and sector addresses. It allows for accessing larger drives than is normally possible with Cylinder, Head, Sector (CHS) Addressing.

LCD _ Liquid Crystal Display - A panel that utilizes two transparent sheets of polarizing material with a liquid containing rod-shaped crystals between. When a current is applied to specific pixel-like areas, those crystals align to create dark images. The dark areas are combined with light areas to create text and images on the panel. LCD panels do not emit light but are often back-lit or side-lit for better viewing.

LCD Panel _ A device used to project video images through a liquid crystal display and an overhead projector onto a large screen. The panel is placed over the stage of an overhead projector, projecting the computer display onto a screen.

LCD Projector _ Utilizing the LCD technique, these projectors separate the red, green and blue information to three different LCD panels. Since LCD panels do not produce color, the appropriate colored light is then passed through each panel and combined to exit through the projector lens and onto a viewing screen.

LCoS _ *Liquid Crystal On Silicon* - An LCD technology that is used to create head-mounted displays (HMDs) as well as projection TVs. The LCoS technology sandwiches liquid crystals between a cover glass and a silicon chip with an aluminum matrix of pixels. The bottom of the cover glass is coated with indium tin oxide that holds a charge, which combined with the charges on the silicon matrix for that pixel, causes the liquid crystals to reflect or block light. For rear projection TVs, three LCoS microdisplays (imagers) are used to modulate red, green and blue light that is combined into one image.

LCRS _ Denotes an audio system that has 4 full range channels (Left, Center, Right, Surround). This signal is often encoded in Dolby Pro-Logic for distribution.

L-cut _ A type of *split edit* where the audio *Out* point is later than the video *Out* point so that the audio continues to be heard with the next video clip.

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

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

LED _ *Light emitting diode* - A low-power, long life, light source that lights up when electricity passes through it. LEDs are usually red green or yellow in color. Some LEDs can produce two different colors.

Legacy - free PC _ A PC that does not contain ISA bus cards, a serial port or a floppy disk drive. It uses the USB bus for expansion through ports in the front and/or back of the unit. A modem and/or network adapter is typically built in. Some legacy-free PCs have available PCI slots, others do not. Legacy-free PCs intended for company use omit the parallel port and rely on the network for printing. Should an older device need to be plugged into a legacy-free PC, there are adapters for serial and parallel ports to USB.

Leisure Software _ Software used for leisure purposes, normally at home. The sector includes games (95%) plus music, film, edutainment, infotainment, sports and associated types of software**.**

Letterbox _ The aspect ratio of motion pictures is wider than those of standard televisions. To preserve the original aspect ratio of a motion picture, a motion picture includes black bars at the top and bottom of the screen when played on television - hence, the name (you feel like you're looking at the world through a mail slot in an old office door).

Level _ a) This term was originally used to describe a value to be set, such as the relative intensity of an audio or video source. The term, however, is nowadays also used to describe the quality steps within MPEG. **_ b)** In computer games, also known as "stage" or less commonly "board," a level is one self-contained, consistently themed area of a game. It can contain various enemies, power-ups, missions, challenges, and/or a boss.

Level of Detail _ A series of models representing the same object and containing increasing levels complexity and detail. The less detailed models are displayed when the viewer is far away. The more detailed models are displayed as the viewer gets closer.

LFE _ *Low-frequency effects* - channel on Dolby Digital 5.1-channel soundtracks carries the powerful low bass frequencies (explosions, rumbles, etc.) that are felt more than heard.

LFO _ An oscillator used as a modulation source, usually below 20Hz. The most common LFO waveshape is the sine wave, though there is often a choice of sine, square, triangular and sawtooth waveforms.

LGMR _ *Laser Guided Magnetic Recording* A SuperDLT technology developed by Quantum that uses both sides of the tape. The recording side contains no servo tracks and is completely filled with data. The reverse side contains a specially formulated coating for an optical track, and a laser does the tracking.

Librarian _ a category of MIDI software that is used to organize and store a MIDI evice's patch (program) data.

Libraries _ Libraries are pieces of code provided by a video game console company that let developers implement functions or graphical and sound effects in their games without having to program them all from scratch. In the PlayStation's case, for instance, Sony prefers that developers not access all the system's hardware directly, but instead use the provided libraries to gain functionality. Think of the libraries as a layer that sits between the physical hardware and the upper levels of the game's code - kind of an interface between the two.

Light Pen _ A light-sensitive stylus wired to a video terminal used to draw pictures or select menu options. The user brings the pen to the desired point on screen and presses the pen button to make contact. Contrary to what it looks like, the pen does not shine light onto the screen; rather, the screen beams into the pen. Screen pixels are constantly being refreshed. When the user presses the button, the pen senses light, and the pixel being illuminated at that instant identifies the screen location.

Light Source _ A light source is any object (visible or not) in a 3D world that emits "light," represented by numerical values that correspond to attributes like intensity and color. This kind of light can then be applied to any polygons in the area using a number of techniques, a couple of which are described here.

Light Valve Technology _ A light valve projector uses a bulb as the source of light. The valve technology changes the color and intensity of the source to form the picture. Film or slide projectors are examples of light valve technology. The Digital Micro-mirror Device (DMD); also know as the Digital Light Processor (DLP), the Image Light Amplifier (ILA), and LCD are all examples of electronic light valve technology. Obtaining black in a picture produced by a light valve projector requires an ability to shut the light off in particular areas of the picture. Shutting light off in a small area is actually rather difficult. Consequently, the real picture contrast ratio of a number of these projectors is rather poor.

Lighting _ There are many techniques for creating realistic graphical effects to simulate a real-life 3-D object on a 2-D display. One technique is lighting. Lighting creates a real-world environment by means of rendering the different grades of darkness and brightness of an object's appearance to make the object look solid.

Limiter _ A device that prevents the voltage of an audio or video signal from exceeding a specified level, to prevent distortion or overloading of the recording device. A limiter is essentially a fast acting compressor with an infinite compression ratio.

Lindows OS _ An operating system for x86 PCs that runs Linux and Windows applications . Lindows OS SPX uses the open source Linux operating system, the Wine Windows-to-UNIX library and proprietary software to provide a Linux desktop environment that also runs certain Windows programs. Introduced in 2001 and expected to ship in late 2002, Lindows OS SPX, or just "Lindows," as it is commonly called, includes the Click-N-Run installation feature that enables both Linux and Windows applications to be downloaded and installed from the Lindows.com Web site with one click of the mouse. For a one-time fee, users will have access to the Web site and be able to download a variety of both proprietary and open source applications.

Line Art _ High-contrast black and white artwork that has no gray tones.

Line Buffer _ A line buffer is a memory buffer used to hold one line of video. If the horizontal resolution of the screen is 640 pixels and RGB is used as the color space, the line buffer would have to be 640 locations long by 3 bytes wide. This amounts to one location for each pixel and each color plane. Line buffers are typically used in filtering algorithms.

Line Doubler _ An electronic component inside many digital televisions that converts a conventional analog broadcast in an interlaced format to a progressive format providing 2x picture density. In addition, line doublers often change the transmission's 480 active scan lines to 960 lines. The device works using a microchip to make intelligent guesses as to what the in-between lines would look like. This results in a crisp, flicker-free image.

Line Level _ Audio signal industry-referenced at 600 ohms, 0dB. Consumer systems may use a different reference.

Line Out _ Audio output. In consumer systems, this may be 10,000 - 50,000 ohms, at -10dB or -20dB.

Line Quadrupler _ An increased definition television feature that produces four times the number of scan lines in a video picture. This fills the space between the original lines, making them less noticeable, and increases the brightness of the picture.

Line Store _ A line store is a memory used to hold one scan line of video. If the horizontal resolution of the active display is 640 samples and RGB is used as the color space, the line store would have to be 640 locations long by 3 bytes wide. This amounts to one location for each sample and each color. Line stores are typically used in filtering algorithms. For example, a comb filter is made up of one or more line stores.

Linear CCD _ a.k.a. scanner-type CCD, these sensors are long and thin, and capture an image by recording a vast number of individual "exposures" while scanning across the picture frame. These are best suited for still subjects and continuous illumination.

Linear Editing _ The process of editing footage that can only be accessed or played in the sequence recorded. Videotape is linear in that it has to be spooled for access to any material and can only play pictures in the order they are recorded. With spooling, jog-ging and pre-rolls absorbing up to 40% of the time in a VTR suite, linear editing is now considered slow. The limitation of having to record items to a final master tape in sequence limits flexibility for later adjustments. For example, it is impossible to insert shots between existing material without starting again. Without special interfaces digital (video) recorders are also partly linear. Although no spooling is needed to access clips, the positioning time of their read/write heads, typically 10ms, is far too long to allow access to any part of the disk during the TV filed interval - just 1,6ms or less- so replay is limited to the accessing the next track, rather than any track and therefore any picture.

Linear Keying _ Selective overlay of one video signal over another, the ratio of foreground to background at any point being determined on a linear scale by the level of the key (control) signal. This form of keying provides the best possible edges and anti-aliasing. It is essential for the realistic keying of semi-transparent effects such as transparent shadows, through windows and partial reflections.

Linearity _ a) The ability of a display device to produce an object the same size anywhere on the screen. For example, poor linearity may show the same line of text one size when it is at the top of the screen, but a different size when it is at the bottom of the screen. **_ b)** Basic measurement of how well an ADC or DAC is performing. Linearity is typically measured by making the ADC or DAC attempt to generate a linearly increasing signal. The actual output is compared to the ideal of the output. The difference is a measure of the linearity.

Line-Locked Clock _ A design that ensures that there is always a constant number of samples per scan line, even if the timing of the line changes.

Lines _ In opposition to the horizontal TV-lines the number of which is predetermined by TV systems, vertical lines serve as a measure for horizontal resolution of a device (or system or format). It is indicated how many vertical, parallel adjacent lines the respective device can display as a pattern consisting of individual lines. The maximum horizontal resolution in lines can also be expressed as frequency and referred to as cut-off frequency.

Lingua Franca _ It implies a common, or standard, language. The term is used in the information industry to refer to the most-widely used format, protocol or command language for a particular purpose. Its actual meaning is "Frankish language," which is spoken in various Mediterranean ports and is a combination of Italian, Spanish, French, Greek, Arabic and Turkish. Its original meaning also implies a hybrid or mixture of languages.

Link _ a) A catch-all word for connecting any computer device to another, i.e. input to output, modem to receiver**. _ b)** Also the connection of one internal function to another, and points on a display. **_ c)** The connections between hypertext pages. Every time you click on highlighted text to go to another page you are following a link.

Link Block _ A block (also known as a sector) of digital rubbish that is written each time the recording laser is turned on (before) or off (after) writing a track or a packet.

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

Linux _ A version of UNIX that runs on a variety of hardware platforms including x86 PCs, Alpha, PowerPC and IBM's product line. In 1990, Finnish computer science student Linus Torvalds turned Minix, a popular classroom teaching tool, into Linux, which is closer to the real UNIX. Torvalds created the kernel, and most of the supporting applications and utilities came from the GNU project of the Free Software Foundation. Many programmers have contributed to the Linux/GNU system Linux is open source software, which is freely available; however, the full distribution of Linux along with technical support and training are available for a fee from vendors. The distribution CD-ROMs include the complete source code as well as hundreds of tools, applets and utilities. Due to its stability, Linux has gained popularity with ISPs as the OS for hosting Web servers. Its usage is expected to grow as a server OS as well as for the desktop. IBM is supporting Linux for all of its hardware platforms in order to have a common OS for all product lines.

Lip Assembling _ Assembling short video clips into a sequence comprising a finished video product.

LIPS _ *Logical Inferences Per Second* - The unit of measurement of the thinking speed of an AI application. Humans do about 2 LIPS. In the computer, one LIPS equals from 100 to 1,000 instructions.

Lisa _ The first personal computer to include integrated software and use a graphical interface. Modeled after the Xerox Star and introduced in 1983 by Apple, it was ahead of its time, but never caught on due to its $10,000 price and slow speed. It gave way to the Macintosh, which was developed by a separate group within Apple. In fact, the final production units of the Lisa were modified into a somewhat-compatible version of the Macintosh.

Lithium _ Some digicams are packaged with a lithium rechargeable battery pack. Lithium batteries are lighter but more costly than NiMH or NiCd type of rechargeable cells. Lithium cells can be recharged regardless of their state of discharge.

Lithium Polymer _ A rechargeable battery technology introduced in 1998 that is similar to lithium ion in power rating. The difference is that lithium polymer uses a gelatinous electrolyte rather than liquid. Thus, instead of requiring a steel can, lithium polymer cells can be manufactured in various shapes and sizes for custom requirements.

Live Feed _ Data which is fed to a server in real time (i.e. as it is recorded), rather than being pre-recorded.

Live-live _ Sometimes used to refer to the streaming of a *live feed*.

Live-streaming _ Streaming media that is broadcast to many people at a set time.

LNG _ Longitudinal Tracks in which audio, timecode and control track signals are recorded.

Load _ load in computer terms means to put some file directly into the memory of a computer (or of a program: e.g. your word processor may load fonts when opening); as opposed to installing, where a program may decide what you need and where parts of the (usually large and complex) installed program will go.

Lobing _ Any time more than one speaker device covers the same part of the frequency range there will be some unevenness in the output. Lobing means that the primary radiation pattern is at some angle above or below the centre line between the two drivers. Good crossover design takes this into account.

Local Bus _ Also called the "system bus," it is the pathway between the CPU, memory and peripheral devices. In the early 1990s, when the higher-speed VL-bus and PCI bus were introduced, they were called local buses, because they ran at the then-current speed of the local bus. Since then, local buses have gone beyond the speeds of VL-bus and PCI. For example, the local bus in many Pentium PCs is 100MHz, three times as fast as PCI's 33MHz.

Local ON/OFF _ A three byte channel message that determines the status of the Local On function of a MIDI device. Local ON allows the instrument to produce sounds from incoming MIDI data and its own keyboard. Local OFF states that only external MIDI data is responded to.

Locked _ When a PLL is accurately producing timing that is precisely lined up with the timing of the incoming video source, the PLL is said to be "locked". When a PLL is locked, the PLL is stable and there is minimum jitter in the generated sample clock.

Lofting _ There are a couple of ways of creating meshes. One way is to digitize real 3D objects in a 3D scanner or digitizer. Another way is to create them from primitives using Boolean operations. The other way is to loft them. Lofting takes 2D polygons or objects and either extrudes or lathes them. In extrusion, the 2D object is stretched in the 3rd dimension either along a straight line or along a curved line. In lathing, the object is revolved around a circular path.

Log _ A list of shots described with information pertinent to content or other attributes; or the act of creating such a list.

Log on (or Log in) _ It's the term that's used to describe what you're doing when you connect your computer (usually via a modem) to a computer Network. You Log On to the Internet (via an ISP) and when you've finished, you Log Off.

Logging _ Term used for searching, selecting and marking of the original material, on the occasion of which it is determined which video and audio Sequences will be used in the final film. Only these parts are then digitized. This saves you time and storage capacity and enables a broader overview. As a rule, a timecode list is produced during logging which includes all start and finish points of the usable scenes. Dubbing of the marked passages can be carried out during logging or later in a separate step known as batch digitizing.

Logic _ The sequence of operations performed by hardware or software. It is the "intelligence" built into everything. Hardware logic is contained in the electronic circuits, following the rules of Boolean logic. Software logic, or program logic, is contained in the patterns of instructions written by the programmer. Software logic is also called business logic when it specifically refers to the transactions of the business and not the operating system or network infrastructure.

Logic Gate _ A collection of transistors and resistors that implement Boolean logic operations on a circuit board. Transistors make up logic gates. Logic gates make up circuits. Circuits make up electronic systems. The truth tables for logic gates follow

Logical Address _ A storage location address that may not describe the physical location; instead, it used as a means to request information from a controller. The controller converts the request from a logical to a physical address that is able to retrieve the data from an actual physical location on the storage device.

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

Logical Drive _ A logical drive is a section of the hard disk that appears to be a separate drive in a directory structure. You create logical drives on the extended partition of a hard disk. While 26 letters exist for logical drives, the first three are reserved. A and B are reserved for floppy disk drives, and C is reserved for the first primary DOS partition. Therefore, you can create up to 23 logical drives on your Extended Partition. Logical drives are usually used to group directories and files.

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

Longitudinal Recording _ The common method of digital recording on a magnetic material. The bits are laid out end to end, and the direction of the magnetic charge is horizontal with respect to the medium.

Longitudinal Timecode (LTC) _ A timecode recorded as an audio signal on the address or the audio track of a video tape, or on a track of audio tape. LTC can be read at high shuttle speeds, enabling timecode readers to stay in sync during rewind or fast forward.

Loop _ to repeat a sequencer pattern or portion of an audio sample repeatedly. The point to which the program returns, whether the beginning or some other point, is usually definable by the user.

Looping _ **a)** The process of continuously repeating a program segment from point A to point B. _ **b)** A term that indicates a high-impedance device is permanently connected in parallel to a video source.

Lossless Compression _ Non lossy, a term used to describe a file compression scheme that reduces the size of a file without losing any of the information in the file. It reduces the size of files by creating an internal shorthand that rebuilds the data as it originally were before the compression. It's lossless because you haven't lost anything. Thus, it is said to be non-destructive to image data when used.

Lossy _ A compression scheme or other process, such as duplication, that causes degradation of signal fidelity. Lossy algorithms compress digital data by eliminating the data least sensitive to the human eye, and offer the highest compression rates available. The more data loss, the smaller the file, and the lower the quality (grainy or jagged edge_ d) image. Lossy compression methods include JPEG and MPEG.

Low-level Access _ Close to the hardware. It refers to writing software that drives the hardware directly without going through a software translation layer and its associated overhead. An operating system can provide both low- and high-level APIs, the high-level ones being capable of very elaborate processing. The low-level APIs make programmers do more work, but allows them access to hardware features. For example, Microsoft's DirectDraw and Direct3D APIs allow direct manipulation of the frame buffer in the display adapter.

Low-level Formatting _ The process of creating Sectors on the disk surface; this permits the Operating System to use the regions needed to create the file structure. Also called initialization.

Low-pass Filter _ A circuit or software algorithm which allows low frequencies to pass but rolls off the high frequencies. Most subwoofers have low-pass filters built in and many surround sound decoders have subwoofer outputs that have been low-pass filtered.

LPB _ *Low-ping bastard* - A player in an online video game whose fast Internet connection gives him an advantage over other players. LPBs are chastised for taking advantage of HPBs, and servers banning LPBs occasionally appear. This is generally a PC-only term, but as consoles gain online capabilities, this label will become increasingly relevant to the console world.

LPI _ An abbreviation for *lines per inch*.

LSB _ *Least significant bit*. The bit that has the least value in a binary number or data byte. In written form, this would be the bit on the right. For example - Binary 1101 = Decimal 13. In this example the right-most binary digit, 1, is the least significant bit--here representing 1. If the LSB in this example were corrupt, the decimal would not be 13 but 12.

LSTA _ *Laptop sync termination adapter* - A pass-through, VGA-style (15- HD connectors) adapter that provides 510 ohms termination for horizontal and vertical sync signals. Most small digital projectors are designed to be near the video source (use short cables). This adapter is used to eliminate jitter and/or intermittent tearing in the displayed image by providing sync termination for long cable runs.

l-system _ Procedural techniques used to generate the illusion of growth in animation.

LTC _ *Linear Time Code*. Time code recorded on a linear analog track on a video tape. Also called Longitudinal Time Code.

LTPS TFT LCD _ *Low Temperature PolySilicon TFT LCD* - An active matrix (TFT) LCD screen that is more durable and less complex than screens made with amorphous silicon substrates. It allows for densities of 300 dpi and greater, and it is expected to enable all the computing electronics to be built within the screen itself. The larger and

uniform silicon grains of polysilicon (poly-Si) allow electrons to flow more freely than through amorphous silicon (a-Si), which is made up of smaller and randomly sized grains. It allows the normally external driver chips to be fabricated on the glass substrate which dramatically reduces row and column connections.

Luggable _ A portable computer that weighs more than you want it to. This was said of many of the first portables such as Compaq's famous, first machine that weighed 30 pounds and catapulted the company to prosperity. Today, any laptop that weighs more than 10 pounds could be called a "luggable."

Luma _ NTSC and PAL video systems use a signal that has two pieces _ the black and white part, and the color part. The black and white part is the luma. It was the luma component that allowed color TV broadcasts to be received by black and white TVs and still remain viewable.

Luma Delay _ A video problem in which the intensity of an object or area is shifted slightly to the right of the color. The color occurs in the correct area of the displayed image, but the luma (intensity) starts later.

Luma Key _ An effect that makes portions of a foreground image fully or partially transparent based on the luminance of that image, so that an underlying image can show through.

Luminosity _ A value corresponding to the brightness of color.

LUT _ *lookup table* - The table of colors a computer can display at a given time. The computer uses the table to approximate the table to approximate the desired color from the range it has available.

LZW _ *Lemple-Zif-Welch* - A lossless compression technique supported by TIFF, PDF, GIF and Postscript file formats. It's most useful in compressing images that contain large areas of single color, such as screenshots or simple paint images.

M

M - JPEG _ Motion JPEG is a video compression process which is based on - JPEG. During this process, each single frame is compressed separately, and the data stream generated in this way is processed as a linked Sequence of JPEG-compressed single frames. There is no universal M-JPEG standard - the individual manufacturers have stipulated their own formats in this regard.

M _ *Mega -* An abbreviation for one million.

M3U _ originally developed in late 1990s as a standard playlist format for MP3s, although its use has since then expanded beyond MP3s. The .m3u files are basically just text files that list one MP3 or other media file on each line, normally with full path or URL to the file. If the .m3u file is loaded to an MP3 player, the player normally plays the list of media files in the order they are listed in the playlist (unless options such as "randomize" have been selected in the MP3 player).

mA _ *milliamp* or one thousandth of an amp.

Mac _ Refers to the *Macintosh* type of computers.

Mac Emulator _ Software that allows Mac applications to run in a foreign environment.

Mac OS _ *Macintosh Operating System* In late 1994, Apple officially renamed its System 7 operating system Mac OS and introduced the Mac OS logo. However, the term has been used for years to refer to all versions of Mac operating systems.

Mac OS X _ Apple's next-generation operating system that is the successor to Mac OS 9. OS X runs legacy Mac applications (OS 9 and previous) as well as applications written for OS X. OS X Server was introduced in 1999, and the client version came out in 2001. OS X Server includes WebObjects, a development system for creating server applications accessible by any Web browser. OS X's new user interface is called "Aqua."

Machine Language _ The native language of the computer. In order for a program to run, it must be presented to the computer as binary-coded machine instructions that are specific to that CPU model or family. Although programmers are sometimes able to modify machine language in order to fix a running program, they do not create it. Machine language is created by programs called "assemblers," "compilers" and "interpreters," which convert the lines of programming code a human writes into the machine language the computer understands. Machine language tells the computer what to do and where to do it. When a programmer writes: **total = total + subtotal**, that statement is converted into a machine instruction that tells the computer to add the contents of two areas of memory (where TOTAL and SUBTOTAL are stored). A programmer deals with data logically, "add this, subtract that," but the computer must be told precisely where this and that are located. Machine languages differ substantially. What may take one instruction in one machine can take 10 instructions in another.

Macintosh _ A family of personal computers from Apple, introduced in 1984. It was the first computer to popularize the graphical user interface (GUI), which, along with its hardware architecture, has provided a measure of unmatched consistency and ease of use. The Macintosh family is the largest non-IBM compatible personal computer series in use. The first Mac had only a floppy disk and 128K of memory, and its "high-rise" cabinet and built-in 9" monochrome screen were unique. Maintained for a number of years and streamlined in its Classic model, the high-rise machine gave way to more traditional cabinetry for a while. Starting in the late 1990s, Apple returned to its roots by introducing the iMac and later the G4 Cube, bringing back its unique flair for cabinet design. The first Macs were powered by Motorola's 32-bit 680x0 family of CPUs. In 1994, Apple introduced the Power-Macs, which used the higher-performance PowerPC chip designed by Apple, Motorola and IBM. PowerMacs run native PowerPC applications and emulate traditional Mac 680x0 applications. PowerPC chips have enjoyed substantial increases in performance. Introduced in 1999, the G4 chip enables a Macintosh to perform one billion floating point operations per second, which provides an extremely fast machine for imaging and graphics-based applications. G5 is the newest addition which again increased the performance of Mac computers.

Macro _ a) A new command created by combining several existing ones. In other words a single command that will activate several others at the same time simultaneously. Often used in repetitive tasks such as creating a letterhead on the top of a document. For example - Type your name and address details and save them as a Macro. Now, next time you want to add them to a new document find and select your Macro and they'll automatically be inserted in the agreed position. **_ b)** In assembly language, a prewritten subroutine that is called for throughout the program. At assembly time, the macro calls are substituted with the actual subroutine or instructions that branch to it. The high-level language equivalent is a function. **_ c)** The ability of a lens to focus very close (less than 8") for taking pictures of small objects at a 1:1 ratio.

Macro Language _ a) A special-purpose command language used to automate sequences within an application such as a spreadsheet or word processor. Macro languages often include programming controls (IF THEN, GOTO, WHILE, etc.), but rarely have the capabilities of a full-blown programming language. **_ b)** Commands used by a macro processor. Same as script.   **_ c)** An assembly language that uses macros.

Macroblock _ In the typical 4:2:0 picture representation used by MPEG-2, a macroblock consists of four eight by eight blocks of luminance data (arranged in a 16 by 16 sample array) and two eight by eight blocks of color difference data which correspond to the area covered by the 16 by 16 section luminance component of the picture. The macroblock is the basic unit used for motion compensated prediction.

MacroVision _ Copying deterrent. MacroVision was first introduced in Disney VHS Cassettes. It alters the image signal so that it becomes impossible to record it on an analog VCR. The DVD Titles themselves can not be MacroVision encoded as MacroVision was designed for analog output. All DVD Decoder cards and some T.V.-Out cards have MacroVision enabled.

MADI _ *Multichannel Audio Digital Interface* - also known as AES-10 standard. Allows interconnection of two devices to transmit up to 56 channels of digital audio (max. word length 24 bits) with a single coaxial cable or via optical link. Standard interface to digital multitrack machines and mixing consoles.

Magnetic Deflection _ A method of altering the path of an object (such as an electronic beam) with a magnetic field. CRTs have magnetic coils that carry currents that create magnetic fields that control the path of electron beam. Also called magnetic focus.

Magnetic Disk _ The primary computer storage device. Like tape, it is magnetically recorded and can be re-recorded over and over. Disks are rotating platters with a mechanical arm that moves a read/write head between the outer and inner edges of the platter's surface. It can take as long as one second to find a location on a floppy disk to as little as a couple of milliseconds on a fast hard disk.

Magnetic-planar Speakers _ A type of speaker that uses a flat diaphragm with a voice coil etched or bonded to it to radiate sound. If the magnets are both in front of and behind the diaphragm, it becomes a push-pull magnetic-planar.

Magneto-optic Disk _ A rewritable optical disk that uses a combination of magnetic and optical methods. MO disks use removable cartridges and come in two form factors. The 3.5" disks hold 128MB, 230MB, 640MB and 1.3GB, and the 5.25" disks hold 650MB, 1.3GB, 2.6GB, 5.2GB and 9.1GB. The latter are double sided, but must be removed and flipped over to use the other side. The 3.5" MO disks are very robust and are used in a variety of storage and archival applications, while the 5.25" disks are typically used in high-end disk libraries. They have a 30-year shelf life and can withstand a million rewrites. MO access times are in the sub-25ms range, compared to more than 100ms for phase change disks, the pure optical technology used in CD-RW, DVD-RAM and PD disks. Data are written on an MO disk by both a laser and a magnet. The laser heats the bit to the Curie point, which is the temperature at which molecules can be realigned when subjected to a magnetic field. Then, a magnet changes the bit's polarity. The laser is focused on one side of the platter, and the magnet is used on the opposite side, which is why double sided media must be flipped over to access the other side. Reading is accomplished with a lower-power laser that reflects light from the bits. The light is rotated differently depending on the polarity of the bit, and

the difference in rotation is sensed. Writing takes two passes. The existing bits are set to zero in one pass, and data are written on the second pass. A direct overwrite method (LIMDOW) was later added that erases and writes in one rotation. Many drives support the LIMDOW disks, which is more costly than standard MO media. Used in the MiniDisc format.

Magnify _ To increase the size of the original image or element. Also to interpolate.

mAh _ A rating used in the consumption of power of an electronic device such as an LCD or the storage capability of a device like an NiMH or Nicad rechargeable battery (i.e. 1600mAh cell). It stands for milliAmperehour.

Mailbox _ It's the folder in your E-mail application that receives your incoming messages.

Mailserver _ The computers at your ISP that sort, retrieve and direct your incoming and outgoing E-mail messages.

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 x 576 x 30).

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.

Mainframe _ a very large computer, used to store and handle very large amounts of data and accessed through a number of terminals wired in from other locations.

Malware _ This is a general slang term often used to refer to an unexpected or *malicious program* (or code) such as a Trojan Virus, Worm Virus or Joke Program.

MAMA _ *Media Asset Management Association* - MAMA serves as a advanced user-group and independent international industry consortium, created by and for media producers, content publishers, technology providers, and value-chain partners to develop open content and metadata exchange protocols for digital media creation and asset management.

Managed Server Hosting _ If an ISP offers you this kind of service, they will be hosting your server and maintaining it for you, for a fee.

Manga _ Japanese comics. A series of manga usually foreruns a licensed anime series, as in the case of Dragonball Z. Wildly popular in Japan, manga has a smaller international audience than anime.

Map _ The process of making one image conform to the size, shape, and/or texture of another.

Mapping _ Placing an image on or around an object so that the image is like the object's skin.

MARC _ *Machine Readable Cataloging*. Standards for the representation and communication of bibliographic and related information in machine readable form.

Mark In/Out _ Points in a clip that have been marked for editing and trimming purposes. A section can be selected from a longer clip by setting its beginning (Mark in) and ending (Mark out).

Markers _ Markers are used in the editing process to indicate important points in the Timeline and/or in individual clips. Markers are for reference only; they do not alter the video program.

Marquee _ The outline of dots created by the selection tool on an image when an operator is performing a task such as cropping, cutting, drawing a mask, etc.

Mask _ **a)** A defined area used to limit the effect of image-editing operations to certain regions of the image. In an electronic imaging system, masks are drawn manually (with a stylus or mouse) or created automatically - keyed to specific density levels or hue, saturation and luminance values in the image. It is similar to photographic lith masking in an enlarger. _ **b)** In the processing of semiconductors, especially ICs, masks (or photomasks) are used in much the same manner as photographic negatives. The surface of a wafer which has been coated with a photoresist is exposed through a mask which determines the size, shape, and interconnection of the various elements such as transistors of the integrated circuits

Mass Storage _ Media for storing large amounts of information - or archiving data.

Master _ The first drive in a dual drive combination. A master drive by itself (with no Slave) is called a single drive.

Master _ The master or master tape is the tape on which the final cut is recorded.

Master Basing _ A popular tape editors term or habit.

Mastering _ Technically, refers to the process of creating a glass master from which CDs are reproduced in quantity. In desktop recordable CD systems, mastering is done together with premastering by the desktop CD-Recorder, and the term is generally used to mean "recording."

Material _ Computer generated colors and patterns applied to model surfaces independent of textures. Materials can contain transparency, specularity, reflectivity and other values.

Mathematically Lossless Compression _ A method of compressing video that does not lose image quality. Mathematically-lossless-compressed video appears identical to uncompressed video, but requires less disk space

Matrix _ In A/V, an electronic device used to collect and distribute video (and/or audio) signals selected from multiple inputs and multiple outputs.

Matrix Encoding _ The technique of combining additional surround-sound audio channels into a conventional stereo signal. Used in Dolby Surround.

Matrix Metering _ An advanced camera light metering system using a multi-segment sensor and computer. With Matrix Metering, a photographer has a high possibility of a correct exposure for most lighting situations, including scenes that incorporate the sun and backlit subjects.

Matrix Switcher _ In audio/video, matrix switching is a means of selecting an input source and connecting it to one or more outputs. Like a regular switcher, but with multiple inputs and multiple outputs.

Matte _ An image that specifies an area of another image, most often used to apply transparency, semitransparency or some other effect to the area specified.

Matting _ The technique of using a *matte* to specify transparency when superimposing video clips.

Mavica _ stands for *Magnetic Video Camera* - Range of digital cameras developed by Sony and using Floppy or CD-RW Media.

Maximizer _ Maximizers are intelligent audio processors. Through the use of targeted compression of audio material they effect a subjective volume increase without actually increasing the audio level.

Mb _ *Megabit* A measurement of data storage capacity on a computer. 125,000 Bytes or 122 Kilobytes.

MB _ *MegaByte*, memory term meaning 1024 KiloBytes. MB [megabyte] is often confused with Mb [megabit], there's 8 bits in a byte so 256Mb = 32MB.

MBC _ *Monitor break-out cable* - A cable used to view a computer signal on a local monitor or terminal while routing the same signal to a new source, such as a data projector or monitor. An MBC provides three connections in the form of a "Y" cable, a "T" cable or through an enclosure box.

Mbone _ *Multicast backbone* - A virtual network consisting of portions of the Internet in which multicasting has been enabled. The Mbone originated from IEFT in which live audio and video were transmitted around the world. The Mbone is a network of hosts connected to the Internet communicating through IP multicast protocols, multicast-enabled routers, and the point-to-point tunnels that interconnect them.

Mbps _ *Megabits per second* - A measurement of data transfer capacity on a computer.

MBR _ Short for *multiple (or multi) bit rate*, and also known as *adaptive streaming,* MBR is a technique by which several streams, compressed at different bitrates, are encoded together into a single file. When the client calls for the media file, a negotiation between client and server determines the available bandwidth, and the appropriate stream is transmitted.

MCM _ *MultiChip Module* or *MicroChip Module* - A chip package that contains two or more raw chips closely connected with high-density lines. This method saves space and speeds processing due to short leads between chips. A ceramic base has been widely used with chips wire bonded together (MCM-C) or with thin film interconnects deposited on the ceramic substrate (MCM-D). MCMs have been mounted onto silicon substrates (MCM-S) and resin-based, laminated printed circuit boards (MCM-L), the latter, less-costly version evolving into the multichip module.

MD _ *MiniDisc* - The first digital, recordable, portable, virtually unshockable personal music format. A compact digital audio disc from Sony that comes in read-only and rewritable versions. Introduced in late 1993, the MiniDisc has been most popular in Japan. The read-only 2.5" disc stores 140MB compared to 650MB on a CD, but holds the same 74 minutes worth of music due to Sony's Adaptive Transform Acoustic Coding (ATRAC) compression scheme, which eliminates inaudible signals. MD discs store disc and track titles displayed by the player. Used for music recording, rewritable MiniDiscs employ magneto-optic technology and come in 60 and 74-minute cartridges.

MDA _ *Monochrome display adapter* - Resolution = 720 x 350. A graphics card found in the IBM PC and PC XT - AT series.

Media _ A term with many different meanings, in the context of ***streaming media***, it refers to video, animation, and audio. The term "media" may also refer to something used for storage or transmission, such as tapes, diskettes, CD-ROMs, DVDs, or networks such as the Internet.

Media 100 _ A non-linear editing system(s) that uses its own proprietary software, developed for both, Mac and Windows platforms.

Media Server _ Specialized server software that takes advantage of appropriate Web transfer protocols such as RTSP (real time streaming protocol), as well as special communication techniques between clients and servers, to facilitate the continuous playback of synchronized audio and video in real time, adjusting the streams transmitted to the actual bandwidth available. Media server software may be running on discrete hardware, or can be deployed in combination with Web server software running on the same device.

Mega Drive _ Also known in the US as Genesis, the machine was a highly successful 16 bit console launched by Sega in 1989. The Mega Drive had an estimated world-wide installed base of 22 m+ units.

Mega Drive 32X _ This was another add-on to the Mega Drive that was launched in late Autumn 1994 by Sega. It allowed players to use dedicated 32 bit cartridge games that only played on the 32X/Mega Drive combination.

Mega-CD _ This was a CD-ROM drive that plays 16 bit Sega CD games when attached to a Mega Drive unit. In many ways it was the forerunner to the Sega Saturn (with which it is incompatible).

Megapixel _ CCD resolution of one million pixels. Digicams are commonly rated by Megapixels. The higher geometric pixel resolution of these sensors produces higher quality digital photographic images. You multiply the horizontal resolution by the vertical resolution to get the total pixel count - 1280 x 960 pixels = 1 Megapixel; 1600 x 1200 pixels = 2 Megapixels; 2048 x 1536 pixels = 3 Megapixels

Memory _ is your computer's physical work space that stores the instructions, programs and data needed to accomplish the tasks executed by the processor. Also known as RAM or random access memory. This is temporary storage for computers which is lost when the machine is switched off. Each memory component stores a number of bits of binary data normally denoted in multiples of kilobits. Memory is like an electronic checkerboard, with each square holding one byte of data or instruction. Each square has a separate address like a post office box and can be manipulated independently. As a result, the computer can break apart programs into instructions for execution and data records into fields for processing.

Memory Based _ Programs that hold all data in memory for processing. Almost all spreadsheets are memory based so that a change in data at one end of the spreadsheet can be instantly reflected at the other end.

Memory Card _ In Digital Photography, a Memory Card is a removable device used in digital cameras to store the images captured by the camera. There are several different types of memory cards available including Compact Flash, SmartMedia, and Memory Stick to name a few.

Memory Chip _ A chip that holds programs and data either temporarily (RAM), permanently (ROM, PROM) or permanently until changed (EPROM, EEPROM, flash memory).

Memory Cycle _ A series of operations that take place to read or write a byte of memory. For destructive memories, it includes the regeneration of the bits.

Memory Cycle Time _ The time it takes to perform one memory cycle.

Memory Effect _ A condition of a rechargeable nickel cadmium battery in which it continues to hold less and less of a charge over time. It appears to "remember" how full it was when last charged, and it doesn't charge past that point the next time. The solution is to completely drain nickel cadmium (NiCD) batteries before recharging them.

Memory Interleaving _ A category of techniques for increasing memory speed. For example, with separate memory banks for odd and even addresses, the next byte of memory can be accessed while the current byte is being refreshed.

Memory Management Unit _ The part of a computer that controls data storage so that the computer primarily accesses its high-performance cache memory rather than its slower main memory. Often abbreviated to MMU.

Memory Module _ A narrow printed circuit board that holds memory chips. Current-day machines use 184-pin DIMM modules for DDR SDRAM, 168-pin DIMM modules for SDRAM or DRAM chips or Rambus modules for RDRAM. Because of space limitations, laptops use small outline DIMMs (SODIMMs). SIMM and Rambus modules are installed in pairs, whereas a single DIMM can be used. PCs use either nine-bit memory (eight bits and parity) or eight-bit memory without parity. Macs use eight-bit memory without parity. SIMMs (single in-line memory modules) evolved into DIMMs (dual in-line memory modules), which doubled the number of paths between the module and motherboard by using each side of the edge connector independently.

Memory Stick _ A flash memory card standard from Sony. Used predominantly in Sony's cameras, computers, and MP3 players.

Memory Stick Duo _ In order to use Memory Sticks in cellphones and other small handheld devices, the Memory Stick Duo provides a smaller-footprint card that is inserted into an adapter that fits into a regular Memory Stick slot. The Duo card can then be transported from any Memory Stick device to a Duo device.

Memory Stick Playback _ A dedicated Memory Stick slot for 1080i playback of JPEG images. This Memory Stick slot in the TVs can playback JPEG photos taken in the DCF (Design Rules for Camera File Systems) format only, which includes most of Sony's digital still cameras. Memory Stick media will allow you to store JPEG or still photo information for viewing those same images on direct view or projection television screen. Televisions, with a Memory Stick input, will convert the JPEG file photos to 1080i or a high definition image when viewing.

MEMS _ *MicroElectroMechanical Systems* Tiny mechanical devices that are built onto semiconductor chips and are measured in micrometers. In the research labs since the 1980s, MEMS devices began to materialize as commercial products in the mid-1990s. They are used to make pressure, temperature, chemical and vibration sensors, light reflectors and switches as well as accelerometers for airbags, vehicle control, pacemakers and games. The technology is also used to make ink jet print heads, microactuators for read/write heads and all-optical switches that reflect light beams to the appropriate output port.

Menu _ programs give you a choice of what commands you wish to give them, by listing the commands in menus (just like meals to choose from in a restaurant). The menus may simply list several options in plain text on the screen (as in DOS and other command-line interfaces) and require you to choose by typing the number or key letter of your chosen command, or in a GUI, menus usually "pull down" (or up) from the menu-bar at the top (or bottom) of the screen. You can leave the menu open, or close it once you have made your choice. Some programs allow menus to be detached from the edge of the screen, and kept handy as "floating palettes", so that you can use them frequently without skidding your mouse from top to bottom all the time. Even if you never read the manual thoroughly, or take the time to learn what your program can and can't do, you will find it very useful to learn what the commands in each menu do ...

Merge _ The function of overlaying two CT images so that both images can be seen in the resulting processing file.

MESECAM _ A technique of recording SECAM video. Instead of dividing the FM color subcarrier by four and then multiplying back up on playback, MESECAM uses the same heterodyne conversion as PAL.

Mesh _ A mesh is a collection of faces which describe an object. An object can be anything, a sphere, a pyramid, a car tire, or an elephant. The faces are arranged in such a way that they form the outside surface of that object. It could be thought of as the skin of the object. The mesh is usually depicted in wireframe mode, as this shows the faces and the outline and does not take very long to render.

Metaballs _ Shapes used in 3D animation to simulate the behavior of bone, muscle and tissue under the surface of a model.

Metadata _ Data about data. Data about the video and audio but not the video or audio themselves. This is important for labeling and finding data - either in a "live" data stream or an archive. Within the studio and in transmission digital technology allows far more information to be added. Some believe metadata will revolutionize every aspect of production and distribution. Metadata existed long before digital networks, video time code and film frame numbers are but two examples.

Metafile _ A file containing information that describes or specifies another file. It generally refers to graphics files that can hold vector drawings and bitmaps. For example, Windows Metafiles (WMFs) and Enhanced Metafiles (EMFs) can store pictures in vector graphics and bitmap formats as well as text. A Computer Graphics Metafile (CGM) also stores both types of graphics.

Metronome _ A device or software function that produces a discrete pulse. Used to synchronize music with a specific tempo.

Mezzanine Compression _ Contribution level quality encoded high definition television signals. Typically split into two levels - High Level at approximately 140 Mbps and Low Level at approximately 39 Mbps (for high definition within the studio, 270Mbps is being considered). These levels of compression are necessary for signal routing and are easily re-encoded without additional compression artifacts (concatenation) to allow for picture manipulation after decoding.

MHz _ Used as a means of measuring the speed of the processor inside your computer. For example, a 650 MHz processor is capable of carrying out 650 million operations per second.

MIC level _ The low level signal generated by a microphone. This must be amplified many times to increase it to line level.

Micro Array _ A semiconductor device that is used to detect the DNA makeup of a cell. It contains hundreds of thousands of tiny squares designed to mate with a particular gene. They react to the liquified human cells poured over it and are detectable by a laser. Micro arrays are expected to revolutionize medicine by being able to pinpoint a very specific disease or the susceptibility to it.

Micro Lens _ Lenses designed for and placed on CCDs to enhance the pixel sensitivity and focus the light into the pixel well.

Micro Processor _ An integrated circuit which is the intelligence of the computer.

Microchip Art _ Graphic images that are drawn into the chip by the chip designer. These images are rarely discovered unless somebody happens to be looking at the chip under a microscope.

Microcode _ Microcode is a low-level set of instructions which performs basic, simple tasks (e.g. fetch [from memory], put [in memory], add et_ c). On one level it can be seen as a programming language, whilst at another level it is merely dynamic equivalent to a set of hard-wired circuits

Microcomputer _ A small, self-contained computer . Also called desktop, personal or portable computer.

Microdisplay _ A microminiaturized display, typically with a screen size less than 1.5" diagonal. They are used in head mounted displays (HMDs), in data projectors and in the traditional viewfinders of digital cameras. Reflective displays bounce light off the displayed image into the viewer's lens or the projection lens. Transmissive displays are similar to backlit, portable computer screens using LCD and EL technologies.

Microdrive _ Developed by IBM, microdrives are extremely small hard disks that can fit in a CompactFlash memory card slot. Microdrives are available in capacities up to 1 Gigabyte enabling digital cameras and PDA devices designed to use CompactFlash memory cards to enjoy even larger storage capabilities.

Microelectronics _ Microelectronics, or microelectronics components, is the generic name covering all miniature components used to construct electronic systems including semiconductor (diodes, transistors and integrated circuits) and passive (for example resistors, capacitors, inductors, relays and sensors) devices.

Microkernel _ The part of an operating system that is specialized for the hardware it is running in. The other components of the OS interact with the microkernel in a message-based relationship and do not have to be re-written when the OS is ported to a new platform. Only the hardware-dependent microkernel has to be reprogrammed.

MicroMV _ Video format that uses MPEG-2 compression to record near DV-quality signals to tapes that are 70% of the size of MiniDV cassettes. At 12Mb/s, MicroMV has a bit rate of less than half that of MiniDV and - according to it's developer Sony - creates significant savings in hard disk space on an editing PC whilst maintaining picture quality that is comparable to DV. However, the MPEG data from the MicroMV camcorders is stored as a MPEG-2 "transport" stream, a format for packaging video intended for transmitting data. On the other hand, most video editing tools are designed to read MPEG-2 "program" streams, the expected format for packaging and storing MPEG-2 video and audio in files, so some problems could occur. All MicroMV camcorders include FireWire interfaces. The cassettes hold 60 minutes of video and include a 64 Kb Cassette Memory chip that provides a visual index of the clips on the tape.

Micron _ One-millionth of a meter, or about forty-millionths of an inch (0.000040 inches)

Microncontroller _ A single chip on which logic and memory circuits are combined that can be programmed to perform specific functions in such products as automobile engines, laser printers, disk drives, home appliances, and VCRs. Often referred to as "embedded controllers". Often abbreviated to MCU

Microprocessor _ The central control unit that directs the processing of data (arithmetic and logic functions) in PCs and other computer systems by directing the flow of electrical impulses, thereby co-ordinating the efforts of other parts of the machine. When the microprocessor receives an instruction, it interprets the instruction and tells the other parts of the computer (disk drives, video display etc) what they should do.

MIDI _ *Musical Instruments Digital Interface* - MIDI is a digital communications standard for electronic musical instruments and effects devices. Controlling of such devices by means of a PC requires a MIDI interface. MIDI provides musical pitch and rhythm information, synthesizer performance parameters, song position markers, stop/start/ continue commands for sequencers and computers, and synchronization data called MIDI Clock, which is based on 24 pulses per quarter-note. MIDI is frequently used with SMPTE for sync-to-tape functions. MIDI is transmitted between microcontrollers at 31.125 Kbits per second. It can also be used by lighting systems and mixing consoles. A computer with a MIDI interface can be used to record a musical session, but instead of recording the analog sound waves as in a tape recorder, the computer stores the music as keystroke and control codes. The recording can be edited in an entirely different manner than with conventional recording; for example, the rhythm can be changed by editing the timing codes in the MIDI messages. In addition, the computer can easily transpose a performance from B major into D major. MIDI files also take up much less disk space than sound files that contain the actual digitized music. The objective of MIDI was to allow the keyboard of one synthesizer to play notes generated by another. However, since Version 1.0 in 1983, MIDI has brought electronic control of music to virtually everybody, benefiting musicians and teachers alike. MIDI makes an ideal system for storing music on digital media due to its small storage requirement compared with digitizing actual music. Since the advent of General MIDI, a standard for defining MIDI instruments, MIDI has become widely used for musical backgrounds in multimedia applications.

Midi Clock _ a system real time message that enables the synchronization of different MIDI devices. The standard rate is 24 divisions per beat.

MIDI file _ A MIDI sound file that contains MIDI messages. MIDI files used in DOS and Windows have a .MID extension. A variation of this format is the RIFF MIDI file, which uses the .RMI extension. The format for MIDI files, or Standard MIDI File (SMF), contains a header "chunk" at the beginning of the file, which defines the format type, followed by one or more track chunks. Type 0 files store all tracks in one track chunk. Type 1 files use a separate chunk for each track, with the first chunk storing the tempo. Type 0 files use less memory and run faster than type 1. Thus, original MIDI music is maintained in type 1 format and frequently distributed in type 0. MIDI files distributed for editing are usually in type 1 format, since it is difficult to convert from type 0 to type 1 using a MIDI sequencer. A less-widely used type 2 file can contain several type 0 files.

Midi Interface _ a device that adds a MIDI In, Out and sometimes Thru port to a desktop computer.

MIDI Mapper _ A Windows application that converts MIDI sound sequences (MIDI messages) to conform to a particular MIDI sound card or module. The keyboard map is used to assign values to non-standard keyboard keys. The patch map assigns sounds to an instrument number. The channel map assigns input channels to output channels.

Midi Merge _ used to combine MIDI data from various sources into a single source.

Midi Message _ the different packets of data that form a MIDI transmission.

Midi Patcher _ a device that allows the routing of one or more MIDI signals to various MIDI devices. Typically reconfigurable to allow for different routings of the data.

Midi Ports _ the three connectors that pass MIDI data into (MIDI in), out of (MIDI out) and through (MIDI thru) a MIDI device.

MIDI Sequencer _ A hardware device or software application that allows for the composition, editing and playback of MIDI sound sequences. Media player applications can play MIDI sound files, but creating and modifying MIDI files requires a sequencer.

MIDI Sound Module _ A stand-alone device that generates MIDI sound. Other MIDI sound-generating devices are keyboard synthesizers and sound cards.

MIDI Timecode _ A system for timed device control through MIDI protocols. Represents the information contained in a SMPTE signal using MIDI messages. The importance of MIDI timecode in video post production has increased due to the increased use of personal computers for video production.

MIDI Voices _ The number of musical notes that can be played back simultaneously in a MIDI sound device. MIDI provides up to 16 channels of simultaneous playback. The number of voices is the total number of notes from all the instruments played back through all the channels. For example, if one of the channels (patches) is a piano, up to 10 fingers could strike the keyboard at the same time, generating 10 notes, assuming that particular piano patch triggers only one waveform. Typically, a MIDI sound card will support from 24 to 32 voices. Keyboard synthesizers and sound modules can handle up to 64.

Midtone _ The tonal value located halfway between then highlight and shadow values.

Migration _ Preserving the integrity of digital images by transferring them across hardware and software configurations and across subsequent generations of computer technology. Migration includes refreshment (copying digital files from one media to another) as a means of preservation and access. However, migration differs from refreshment in the sense that it is not always possible to make an exact copy of a database or even an image file as changes in hardware and software occur and still maintain compatibility with the new generation of technology.

Milli _ Abbreviation for one one-thousandth. Example - 1 ms = 1/1000 second.

MIME _ Multipurpose Internet Mail Extensions _ A format originally designed to support static and animated images, sounds or other background features within E-mail messages.

MiniCD _ The small diameter (3-inch) CD discs. MiniCD-R and miniCD-R/W discs are used in some digicams. Their maximum capacity is ~165MB

MiniDisc (MD) _ The portable, digital, recordable format that lets you make your mixes from a variety of audio sources (even PC) then edit them and rerecord them onto durable 2-3/4" discs.

MiniDisc Long Play (MDLP) _ MDLP lets you record up to 4 times longer in stereo (up to 320 minutes on a blank 80-minute MiniDisc).

MiniDV_ Not really a format – rather describing the use of a small DV cassette in camcorders and/or other devices. MiniDV is standardized among many manufactures like Canon, Panasonic and Sony, making it possible to record or play MiniDV tapes in any device designed for this format.

MiniDVD _ miniDVD is not a real format, but a hack instead that uses standalone DVD players" abilities to play back regular CDs. Basically miniDVD is a regular CD that has the same structure as regular DVD-Video has. Most of the standalone DVD players can be fooled to think that the disc inserted is a regular DVD-Video disc and to play it. Biggest problem with miniDVDs is the fact that DVD movies tend to take appx. 4GBs of space and in CD you can just fit ~700MB of data -> one movie ends up taking 6 or more CDs. Therefore most of the people don't use miniDVDs, but use some other standalone DVD player-compliant formats instead, like VCDs, SVCDs or their varieties.

MIP Mapping _ *Multum in Parvum* (Latin) means "many in one". A method of increasing the quality of a texture map by applying different-resolution texture maps for different objects in the same image, depending on their size and depth. If a texture-mapped polygon is smaller than the texture image itself, the texture map will be undersampled during rasterization. As a result, the texture mapping will be noisy and "sparkly". The purpose of MIP mapping is to remove this effect.

MIPs _ *Millions of instructions per second*, this is used as a unit of comparison between high performance computers (usually workstations). This unit can however, sometimes prove misleading, as computers process different tasks (programs) at different speeds. A higher MIPs rating does not therefore necessarily equate to a faster computer though, generally this is the case.

Mirror Site _ This is a ftp site that contains a complete copy of the files on the web site it is mirroring. This may happen several times in different countries throughout the world, and is used to relieve the pressure that can be put on a very popular web site. It makes it easier and quicker for the users to access and download files.

Mistracking _ Incorrect tape-to-head contact or tape-path contact causing picture distortion as bursts of noise on replay.

Mix _ The blend of dialogue, music, and effects which comprises a film's soundtrack. Also, when used as a verb, the process of assembling and balancing these elements electronically, thereby creating the final soundtrack.

Mixed Reality _ A type of virtual reality that combines real and imagined images. In "augmented reality," most of the images are real. For example, using transparent headsets, you could see how that new sofa would look in your own living room, or view the 3-D schematic of a jet engine while you work on the engine itself. With "augmented virtuality," most of the imagery is computer-generated. For example, you might see something real, perhaps even yourself, projected into an imaginary environment.

Mixed Resolution Editing _ If an editing system features the Mixed Resolution Editing function, this function permits the use of material of different quality levels in one and the same Project. This is important if the material was digitized in various resolutions in order to save fixed disk capacity.

Mixed Signal _ The combination of analogue an digital technology on one IC.

Mixed-Mode Disc _ A CD that includes both computer data and CD-DA tracks. The data is all contained in Track 1, and the audio in one or more following tracks.

Mixed-Signal Device _ collects analog signals and converts them into digital data to be processed. Once a DSP processes and compresses the digital data, a mixed-signal device decompresses, transmits and displays the digital data as either digital or analog signals.

Mixer _ A device for combining several audio or video inputs.

MLP _ *Meridian Lossless Packing* - 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 recreated perfectly by the MLP decoder.

MMC _ a) A standard command set used by CD-Recorders. Many newer recorders follow this standard, though many of them also interpret it differently (so there are still differences in how software must address these recorders, in spite of the standard). **_ b)** MultiMedia Card, a flash memory card used in some digicams and MP3 players. It is identical in size and shape to the Secure Digital (SD) flash cards.

MMDS _ *Multichannel, Multipoint Distribution System* - A wireless cable system capable of being encoded for pay-per-view and subscriber services.

MMX/SIMD _ Intel technology now incorporated into all current Intel processors that allows enhancements to multimedia performance.

MO Disk _ Magneto-optical disk. MO disks combine the technical benefits of an optical medium (CD) with the advantages of magnetic recording. The storage capacities per disk are in the gigabyte range. Because they are secure and robust, MO disks are particularly well suited to archiving.

Mobile Processor _ A CPU chip designed for portable computers. It is typically housed in a smaller chip package, but more importantly, it uses lower voltages than its desktop counterpart in order to run cooler and has more "sleep mode" capability. A mobile processor can be throttled down to different power levels and/or sections of the chip can be turned off entirely when not in use.

Model _ A free-form, 3D object.

Modeling _ The process of creating freeform 3D objects. There are many ways of creating meshes on a computer. In order to acquire a complex mesh, it can often be digitized. More often however, one has to model the mesh. Modeling is the process of creating 3D objects from simple 2D objects by lofting, or from other simple 3D objects called primitives. Primitives can be combined using a variety of Boolean operations. They can also be distorted by dragging around their vertices or distorted in different ways.

Modem_ *Modulator/demodulator* - A device that puts information on a carrier signal and transmits it over a (phone) network. The same device receives such signals and demodulates, or separates the information from the carrier. A modem connects computers with other communications devices through ordinary phone lines.

Moderator _ An arbitrator or mediator. Usually a user, who controls "who can speak about what" in a chat room.

Modulation _ The process of adding an information signal to a carrier frequency to allow it to be transmitted. Thus, the carrier is "modulated" by the information signal, as in a modem.

Modulation Wheel _ one of several common continuous controls on a MIDI device. Often used to add a vibrato effect to a sound.

Modulator _ A modulator is basically a circuit that combines two different signals in such a way that they can be pulled apart later.

MOE _ *Massive Operator Error*.

Moiré _ This is a type of image artifact. A moiré effect occurs when a pattern is created on the display where there really shouldn't be one. A moiré pattern is typically generated when two different frequencies beat together to create a new, unwanted frequency. This may appear as a wavy motion.

Mole Technology _ A seamless MPEG-2 concatenation technology in which an MPEG-2 bit stream enters a Mole-equipped decoder, and the decoder not only decodes the video, but the information on how that video was first encoded (motion vectors and coding mode decisions). This "side information" or "metadata" in an information bus is synchronized to the video and sent to the Mole-equipped encoder. The encoder looks at the metadata and knows exactly how to encode the video. The video is encoded in exactly the same way (so theoretically it has only been encoded once) and maintains quality. What Mole can not do is make the encoding any better. Therefore the highest quality of initial encoding is suggested.

Monitor _ a) A school pupil with disciplinary duties _ **b)** A TV that receives a video signal directly from an external source, such as a VCR, camera or separate TV tuner, to produce a high quality picture. _ **c)** A video display used with closed circuit TV equipment. _ **d)** A device used to display computer text and graphics.

Monitor Calibration _ The process of setting lookup tables to make the color monitor match output color.

Monkey Cam _ A form of wobblecam - a US developed method by Dave Letterman Show where they strap a small camera on a monkey and let him loose into the audience, lighting grid, or anywhere else he wants to go.

Monochrome _ A monochrome signal is a video source having only one component. Although usually meant to be the luma (or black-and-white) video signal, the red video signal coming into the back of a computer display is monochrome because it only has one component.

Monochrome Composite Output _ Provides a monochrome video output with combined horizontal and vertical sync for composite video with all the shades of the computer's monochrome, 8-, 16-, or 64-color display adapter card output signal.

Monochrome Signal _ A single color-video signal. A monochrome signal is usually black and white, but can be the luminance portion of a composite- or component-color signal.

Monophonic _ The ability to play only one note at a time. A characteristic of some older synthesizers.

Monopole _ Any speaker that encloses the backwave of the speaker device even though part of this backwave may be released via a port or duct. The primary radiation at most frequencies will be from the driver front. If the driver is not enclosed it becomes a dipole.

Monotonic _ This is a term that is used to describe ADCs and DACs. An ADC or DAC is said to be monotonic if for every increase in input signal, the output increases. Any ADC or DAC that is nonmonotonic - meaning that the output decreases for an increase in input - is bad! Nobody wants a nonmonotonic ADC or DAC.

Montage _ The process of combining and blending images or elements.

Moore's Law _ A prediction for the rate of development of modern electronics. This has been expressed in a number of ways but in general states that the density of information storable in silicon roughly doubles every year. Or, the performance of silicon will double every eighteen months, with proportional decreases in cost. For more than two decades this prediction has held true. Moore's law initially talked about silicon but it could be applied to disk drives - the capacity of disk drives doubles every two years. That has been true since 1980, and will continue well beyond 2000. Named after Gordon E. Moore, physicist, co-founder and chairman emeritus of Intel Corporation.

MOPS _ *Mega Operations Per Second* - The measurement of instructional performance of a system. It often refers to DSP operations.

Morphing _ short for "*metamorphosis*". A special visual effect, used in both film and video, which produces a smooth transformation from one object to another. Morphing programs work by marking prominent points, such as tips and corners, of the before and after images. The points are used to mathematically compute the movements from one object to the other

MOS _ **a)** Acronym for *Metal-Oxide-Silicon*, one of two basic IC designs along with bipolar, is the fastest growing because it is cheaper, easier to use and consumes less power. _ **b)** *Media Object Server* (Protocol). A communications protocol for newsroom computer systems (NCS) and broadcast production equipment. It is a collaborative effort between many companies to enable journalists to see, use, and control a variety of devices from their desktop computers, effectively allowing access to all work from one screen. Such devices include video and audio servers and editors, still stores, character generators and special effects machines.

MOSFET _ *Metal Oxide Semiconductor Field Effect Transistor* - A common type of transistor fabricated as a discrete component or into MOS integrated circuits.

Motherboard _ The computer's main circuit board which contains the main circuit components and connections and into which all other boards and components fit.. It's often varnished and treated with green lacquer.

Motion _ In video, the term "motion" is used as opposed to "still" because there can be a difference in the way these two types of video are processed for the best viewing results, especially when the video is line-doubled or line-quadrupled. Motion video includes movies and TV programs, while still includes text and slide presentations.

Motion Blur _ A blurring effect that occurs in film and video when objects move quickly. Also, an effect available in most of the picture editing software.

Motion Capture _ A process that captures the movement of a live or at least articulate model and applies it to a 3D model. Sensors are attached to various points on the (usually human) model and record motion data as the model moves. The data can then be used to animate a model in the computer, resulting in very lifelike movement. Motion-captured animation generally requires a degree of retouching to clean up the movements.

Motion Compensation _ The use of motion vectors to improve the efficiency of the prediction of pixel values. The prediction uses motion vectors to provide offsets into past and/or future reference frames containing previously decoded pixels that are used to form the prediction and the error difference signal. Used in MPEG.

Motion Control Photography _ A system for using computers to precisely control camera movements so that different elements of a shot can later be composed in a natural and believable way.

Motion Effect _ Speeding up, slowing down or strobing of video.

Motion Estimation _ An image compression technique that achieves compression by describing only the motion differences between adjacent frames, thus eliminating the need to convey redundant static picture information from frame to frame. Let's take an example of a video source showing a ball flying through the air. The background is a solid color that is different from the color of the ball. In one video frame the ball is at one location and in the next video frame the ball has moved up and to the right by some amount. Now let's assume that the video camera has just sent the first video frame of the series. Now, instead of sending the second frame, wouldn't it be more efficient to send only the position of the ball? Nothing else moves, so only two little numbers would have to be sent. This is the essence of motion estimation. Used in the MPEG standards.

Motion Stabilization _ A software feature used to eliminate the wobble in the video taken with a hand-held camera.

Motion Vectors _ Direction and distance information used in MPEG encoding. This defines the movement of an image portion from one frame to the next.

Motion Video _ Refers to moving video images, but does not imply a frame rate. Full-motion video refers to fluid, TV-like images displayed at a rate of 24 to 30 frames per second.

Mount Rainier _ A format for providing platform interoperability and native OS support for CD-RW and DVD+RW disks. The "MRW" or "CD-MRW" format enables files to be saved to RW disks as if they were hard disks (from any Save dialog or dragged and dropped). Mount Rainier supports the UDF file system and automatically formats a blank disk when it writes it for the first time. It allows the disk to be ejected before it is fully formatted by "de-icing" it, which saves the data necessary to continue the format later. Mount Rainier also supports defect management, which masks bad sectors and writes the data into spares like a hard disk. In addition, it reduces block size from 64KB to 2KB for more efficient use of disk space. A driver can be added to legacy CD-ROM and CD-RW drives for read compatibility with MRW disks.

MOV _ Apple QuickTime MOVie file format. Also, the file extension used by MOV format video files on Windows. These MOV files are generated with Apple Computer's QuickTime and played on Windows systems via QuickTime for Windows.

Movie File _ A file that contains full-motion, digital video, such as an AVI file.

MP@ML _ *Main Profile@Main Level* - An MPEG-2 video compression profile that supports 4:2:0 luminance/chrominance sampling at up to 720×576 pixel resolution, and data transfer rates up to 15 Mb/sec (1.79 MB/sec). This profile is used for broadcast transmission and distribution on DVD.

MP3 _ Stands for MPEG, Audio Layer 3. MP3 is both an audio compression technology and a digital audio file format. It is currently the most popular audio format on the web because of its high sound quality and small file size, and because MP3 encoders are easily available on the Internet so that music can be downloaded and played using a computer or handheld device. The file extension for an MP3 file is usually ".mp3". MPEG defines the bitstream and the decoder but, to allow for future improvements, not an encoder. MP3 is claimed to achieve "CD quality" at 128 - 112 kb/s - a compression of between 10 and 12:1.

MPCD _ *Minimum Perceptible Color Difference* - This is a unit of measure, developed by the CIE, to define the change in light and color required to be just noticeable to the human eye. The human being in this MPCD unit is defined as "a trained observer" because there are differences in the way each of us perceives light.

MPEG _ A video and audio compression standard that specifies a series of compression profiles and image resolution levels, introduced in 1990 by the *Motion Picture Experts Group*. Its work follows on from that of JPEG to add interfiled compression, the extra compression potentially available through similarities between successive frames of moving pictures. In the case of MPEG being an asymmetrical compression method, coding is far more complicated than decoding. MPEG specifies the data format and the decoding process, but lets the manufacturer decide how to create the data. Each manufacturer can use his/her own coding method and algorithms, as long as standard MPEG-coded data streams are created that can be read and played-back with any standard MPEG decoder. An important difference between MPEG and other compression procedures such as M-JPEG is that MPEG does not necessarily compress single frames (intraframe) only, but can also analyze the data of several successive images and use the information derived from this for compression. On this basis a video Sequence can be compressed far more effectively, as frame information of several single frames can be collated. In technical jargon this is referred to as Interframe Compression. The single frames of a video Sequence are composed of I, B and P frames, in accordance with the MPEG standard. I frames are index frames. They contain all important frame information and are generally compressed in the same fashion as is done for each single frame during a motion JPEG compression. However, with MPEG it is also possible to implement different levels of compression in different sections within a frame, for example, the compression implemented for the frame center is less than that implemented at the edges. Compared to

motion JPEG, this feature permits a 10 - 15% data reduction with the same level of optical quality. B frames are bidirectional frames, i.e. frames which only contain the differences between a frame and the previous or following one. The term "P frame" stands for Predicted Frames. They are interpolated on the basis of frames which have appeared so far. The MPEG standard refers to the Sequence of I, B and P frames as a Group of Pictures (GOP). Each manufacturer can use GOPs of any length and composition. The only prerequisite is that a GOP must contain at least one I frame. The subject area of GOP also incorporates a restriction or, at least an obstacle which is typical of MPEG. Editing in the middle of a GOP is either not possible at all or requires considerable technical effort. Therefore, MPEG-based interfaces work with very short GOPs or exclusively with I frames. Initially, MPEG was defined as a common basis for four individual standards. Both MPEG-1 and MPEG-4 work with low data rates and are therefore primarily suited for multimedia or telecommunications applications. MPEG-3 was originally used in HDTV applications but is today only used for audio compression (MP3), whereas video compression was later integrated into the MPEG-2 standard. In professional video systems, the MPEG-2 standard plays the most important role. MPEG-2 is divided into various profiles and levels for which different parameters were stipulated. In post-editing, MPEG-2 422P@ML has been established (also referred to as 422 Studio Profile@Level). This MPEG version only operates with I frames and 4:2:2 sampling; the resolution is 720 x 608 pixels. The standardized maximum data rate is around 50 Mbits/s. Hence, MPEG-2 provides a special subprocedure for different applications. It is equally important to note that, while MPEG-2 prescribes the decoding in detail, it is up to the individual manufacturers to use their own coding procedure. The only prerequisite is that MPEG-2-coded data must be readable and playable on any type of MPEG-2 decoder. Therefore, in contrast to M-JPEG, exchangeability of MPEG data between two systems is ensured.

MPEG 4:2:2 _ Also referred to as Studio MPEG, Professional MPEG and 442P@ML. Sony's Betacam SX is based on MPEG 4:2:2.

MPEG Decoder _ Software or hardware that decompresses MPEG data into viewable form. The results are not exactly the same as the original video image, because MPEG is a lossy compression method.

MPEG Splicing _ The ability to cut into an MPEG bit stream for switching and editing, regardless of type of frames (I, B, P).

MPEG-1 _ MPEG-1 was the Experts first attempt at making a standard by which audio and video could be shared on a compact disk. This multi-layered format was finalized in 1992, and allows audio and video to be transferred at bitrates of approx 1.5 megabits per second (same rate as a single speed CD-ROM drive). Actual compression over uncompressed digital video is about 100:1. This equates to near VHS-quality video and sub-par quality audio (MP3"s). Playback of MPEG-1 video requires either a software decoder coupled with a high-end computer or a hardware decoder. MPEG-1 is typically used in applications such as CD-ROMs and Video CDs and nowadays MP3 CDs, where high levels of quality are compromised in order to save space. An interesting fact is that MP3"s are actually the third layer, or part, of the MPEG-1 standard.

MPEG-1 Layer 1, 2, 3 Audio _ Different audio codecs are provided in the MPEG standard, i.e. layer 1, layer 2 and layer 3. The complexity and performance of these schemes increases from layer to layer. The layers are upward-compatible with each other, i.e. a layer-2 decoder also accepts layer-1 audio, but not layer-3 audio. All 3 layers can use 32, 44.1 or 48 kHz sampling frequencies. Layer 2 is of importance in creating DVD. Layer 3 is used in PM3 format.

MPEG-2 _ MPEG-2 was finalized in 1996, and was a substantial improvement over MPEG-1. This has been designed to cover a wide range of requirements from "VHS quality" all the way to HDTV through a series of algorithm "profiles" and image resolution "levels." With data rates of between 1.2 and 15 Mbps, there is intense interest in the use of MPEG-2 for the digital transmission of television - including HDTV - applications for which the system was conceived. Coding the video is very complex, especially as it is required to keep the decoding at the reception end as simple and inexpensive as possible. MPEG can offer better quality pictures at high compression ratios than pure JPEG compression, but with the complexity of decoding and especially coding and the 12-long group of pictures (GoP), it is not an ideal compres-

sion system for editing. If any P or B frames are used then even a cut will require the re-use of complex, and not perfect, MPEG coding. However, MPEG Splicers are beginning to appear to alleviate this difficulty. Of the six profiles and four levels creating a grid of 24 possible combinations, 12 have already been implemented. The variations these define are so wide that it would not be practical to build a universal coder or decoder. Interest is now focused on the Main profile, Main level, sometimes written as MP@ML, which covers broadcast television formats up to 720 pixels x 576 lines at 30 frames per second. These figures are quoted as maximums so 720 x 486 at 30 frames are included, as are 720 x 576 at 25 frames. As the coding is intended for transmission the economy of 4:2:0 sampling is used. A recent addition to MPEG-2 is the studio profile. Designed for studio work its sampling is 4:2:2. The studio profile is written as 422P@ML. To improve the picture quality, higher bit rates are used.

MPEG-2 IBP _ Just another name for a MPEG-2 compression type that uses inter-frame compression to create a group of I, B, and P-frames. Used for broadcast transmissions and distribution on DVD.

MPEG-2 I-frame _ Just another name for MPEG-2 compression type that uses only intra-frame compression (that is, only I-frames are created). Used for high-quality distribution and for archiving.

MPEG-21 _ The Motion Picture Experts Group's attempt to get a handle on the overall topic of content delivery. By defining a Multimedia Framework from the viewpoint of the consumer, they hope to understand how various components relate to each other and where gaps in the infrastructure might benefit from new standards.

MPEG-3 _ MPEG-3 was originally targeted for HDTV applications. This was incorporated into MPEG-2, so there is no MPEG-3 standard.

MPEG-4 _ ISO/IEC 14496. Whereas MPEG-1 and MPEG-2 are about efficient storage and transmission, MPEG-4 is mostly about interactivity. First published in early 1999, it offers multimedia storage, access and communication at low bit rates as well as viewer interaction and 3D broadcasting. It is based on MPEG-1, MPEG-2, and Apple's Quicktime and designed to serve integrated video/animations/audio/text over a narrow bandwidth. The industry - both formally and informally - is quickly adopting this new standard. MPEG-4 will be and is starting to be utilized in many ways, from next generation mobile communication to video on demand and related applications. MPEG-4 supports an object-based approach, where scenes are modeled as compositions of objects, both natural and synthetic, with which the user may interact. Visual objects in a scene can be described mathematically and given a position in a two- or three-dimensional space. Similarly, audio objects can be placed in a sound space. Thus, the video or audio object need only be defined once; the viewer can change his viewing position, and the calculations to update the audio and video are done locally. Classical "rectangular" video, as from a camera, is one of the visual objects supported. In addition, there is the ability to map images onto computer-generated shapes, and a text-to-speech interface. Although well-known as a low bitrate, low resolution solution for wireless devices, MPEG-4 also supports HDTV resolutions and studio applications. MPEG-4 offers bit rates of about one-half those used for MPEG-2 of similar video quality. "DVD quality" is achievable at about 1.5-2 Mbps, with "HDTV quality" at about 7 Mbps. Thus, a 6 MHz cable channel can support up to 24 SDTV channels of MPEG-4 content instead of 12 channels of MPEG-2 content.

MPEG-7 _ formally called "Multimedia Content Description Interface" standardizes the description of multimedia material (referred to as metadata), such as still pictures, audio, and video, regardless if locally stored, in a remote database, or broadcast. Examples are finding a scene in a movie, finding a song in a database, or selecting a broadcast channel. The searcher for an image can use a sketch or a general description. Music can be found using a "query by humming" format.

MPEG-EX _ Motion JPEG movie file created by Sony digital cameras. This was the first motion video recording sequence mode that was limited in length only by the amount of available storage space.

MPEG-HQX _ Motion JPEG movie file created by latest Sony cameras that incorporates the MPEGHQ (high quality, full-screen) and the unlimited recording capability of MPEG-EX in 320x240 resolution.

MPEG-IMX _ Sony's trademark for a family of devices, such as DVTRs, that are I frame-only 50 Mbps MPEG-2 streams using Betacam style cassettes. Plays Digital Betacam, Betacam SX, Betacam SP, Betacam, and, MPEG IMX, outputting 50 Mbps MPEG I-frame on SDTI-CP regardless of the tape being played. It can also handle other (lower) input and output data rates, but the recordings are 50 Mbps I-frame in any case.

MPU _ MPU stands for *Micro Processing Unit*. It refers to the same device as a CPU (Central Processing Unit).

MSB _ *Most Significant Bit* - Binary numbers are represented by a series of ones and zeros. For example - Binary 1110 = Decimal 14. In this example the left-most binary digit, 1, is the most significant bit - here representing the presence of 23 i.e. 8.

MS-DOS _ *Microsoft Disk Operating System* - A single user operating system for PCs from Microsoft. It is functionally identical to IBM's PC-DOS version, except that starting with DOS 6, MS-DOS and PC-DOS each provided different sets of utility programs. Both MS-DOS and PC-DOS are called DOS.

MSN TV _ The first Internet TV service that obtained widespread distribution of its set-top boxes in the retail channel. Developed in 1996 by WebTV and acquired by Microsoft in 1997, MSN TV uses an analog modem and telephone line to deliver the Web to the TV set.

MSTO _ *Machine Smarter Than Operator*.

MTBF _ *Mean Time Between Failure* - A statistical assessment of the average time taken for a unit to fail - a measure of predicted reliability. The MTBF of a piece of equipment is dependent on the reliability of each of its components. Generally the more components the lower the MTBF, so packing more into one integrated circuit can reduce the component count and increase the reliability. Modern digital components are highly reliable.

MTC _ *MIDI Time Code.*

MTS _ *Multichannel Television Sound* - A generic name for various stereo audio implementations, such as BTSC and Zweiton.

MTTR _ *Meantime to Repair* - The average time it takes to repair a drive in the field. In the field, only major subassemblies are changed (the PCB, sealed housing, etc.), excluding component level repairs as these are not performed in the field.

MUD _ *Multiuser Dungeon, Multiuser Dimension, Multiuser Dialogue* - Interactive games played by several people at a time on the Internet. Originally dungeons and dragon games with demons, elves and magicians, MUDs have been created for science fiction themes, cartoon characters and other types of games. MUDs have also evolved into 3-D virtual reality sites. There are many variations and permutations of MUDs. MOOs are object-oriented MUDs, and MUSEs (Multiuser Shared Environments) are generally designed for elementary and secondary students. A MUSH (MultiUser Shared Hallucination) allows new rooms and situations to be created. A MUCK (MultiUser Chat Kingdom) is a text-based MUD system similar to MUSH, and there is yet another MUCK (MultiUser Construction Kit), heavy on fantasy and myth.

Muddy _ Listening term. A sound that is poorly defined, sloppy or vague. For example, a muddy bass is often boomy with all the notes tending to run together.

Multi - Processor _ Some of the newer workstations and computers can be equipped with more than just one standard (CPU) and are not limited to one processor, as is the case with normal PCs. This can considerably increase the efficiency and speed of these workstations.

Multi - Tracking _ The multi-Tracking function is predominantly found in compositing systems. This function permits the marking of objects within a frame Sequence, by the definition of one or, preferably , several (up to 4) distinctive points edges or transitions and the Tracking of the movements of the object over the complete scene. The Tracker analyses and records the movements and also permits the allocation of these movement Sequences to other objects. In this way, moving objects can also be used as a template for masks and keys. Furthermore, the recorded movement Sequences also allow computer-generated objects to be realistically integrated into scenes, during which the camera is moving.

Multicasting _ The option to multicast was made possible by digital technology to allow each digital broadcast station to split its bit stream into 2, 3, 4 or more individual channels of programming and/or data services. (For example, on channel 7, you could watch

7-1, 7-2, 7-3 or 7-4.) The infrastructure to handle multicasting, known as the **M-Bone** (multicast backbone) is still emerging; the Internet is not yet ready for the popular proliferation of multicasting. The terms "multicast" and *narrowcast* are sometimes used interchangeably, although "multicast" more specifically refers to the actual technology inherent in the process.

Multilevel Optical Disk _ An optical disk technology that uses multiple platters sandwiched together with a tiny spacer between them. The different layers are accessed by moving the lens up and down and focusing on one of the disk surfaces. IBM demonstrated this technology in 1994 at its Almaden Research Center in San Jose, CA, and showed its feasibility with various optical technologies. In 2001, multilevel CD drives and media were introduced.

Multi-media _ This heavily abused term, which is at times used rather randomly (and arbitrary) for totally different subject matters and circumstances, is undergoing continuous semantic change. According to one of the more precise definitions, multimedia is the combination of the most varied of media communication methods in one interactive medium. Some even argue that TV is multimedia (if you have the sound up). More typically it is pictures (moving and still), sound and often text combined in an interactive environment. This implies the use of computers, with the significant amount of data this requires usually supplied either on CD-ROM or via a data link. "Surfing the net" is an example. High compression ratios are used to allow the use of pictures. One of the first applications has been in education. A huge expansion is happening as both the computer hardware and software suppliers, as well as the telecommunications companies, see multi-media as being a major method of communication for business and into the home. Multi-media has a wide meaning. Another example is in the production of material which is published in many forms. For example pictures from television productions can be transferred to print for listings magazines and advertising.

Multimedia Extensions _ Windows routines that support audio recording and playback, animation playback, joysticks, MIDI, the MCI interface for CD-ROM, videodiscs, videotapes, etc., and the RIFF file format.

MultiMediaCard _ A storage module used in cellphones, PDAs and other handheld devices. Introduced in 1997 with a 4MB capacity, the (32x24x1.4mm) MultiMediaCard weighs less than two grams. By 2003, storage increased to 256MB, and 1GB is expected by 2004. The card uses flash memory for read/write applications or ROM chips for static information, the latter widely used for adding applications to a Palm PDA. One-time programmable (OTP) versions of the card are also available. High-speed transfer rates from 26 to 52 Mbytes/sec are expected in 2004. Two secure versions of the MultiMediaCard are offered. SecureMMC for Content Protection is used for copyrighted material. It contains encrypted content in readable flash memory and licensing information in a hardware-protected, tamper proof part of the card. SecureMMC for M-Commerce is a high-level security card for e-commerce transactions. RS-MMC (Reduced-Size MMC) cards, measuring 18X24x1.4mm, are available for mobile smart phone applications.

Multipass Encoding _ True multipass encoding is currently available only for WM8 and MPEG-2. An encoder supporting multipass will, in a first pass, analyze the video stream to be encoded and write down a log about everything it encounters. Let's assume we have a short clip that starts out in a dialog scene where we have few cuts and the camera remains static. Then it leads over to a karate fight with lots of fast cuts and a lot of action (people flying through the air, kicking, punching, etc.). In regular CBR, encoding every second gets more or less bitrate (it's hard to stay 100% CBR but that's a detail) whereas in multipass VBR mode the encoder will use the bitrate according to his knowledge about the video stream, i.e. the dialog part gets the available bitrate and the fighting scene gets allotted more bitrate. The more passes, the more refined the bitrate distribution will be. In single pass VBR, the encoder has to base his decisions on where to use how much bitrate solely on the knowledge of the stuff it previously has encoded.

Multipath Interference _ The signal variation caused when two RF signals take multiple paths from transmitter to receiver. In analog television, this creates ghosting. In digital television, this can cause the receiver not to output a signal as it can not differentiate between signals.

Multiplayer _ A mode of gameplay involving two or more players. Multiplayer can be carried out with multiple people playing on the same system or over the Internet. Almost all competitive games include a multiplayer option.

Multiplayer Game _ A game that is played by a number of people either against each other or in co-operation with each other. This is as distinct from a single-player game in which the user plays against the computer/console/mobile device etc…

Multiple Angle Viewing _ Accesses multiple-angle authoring on a DVD-a feature included on select DVD titles that shows the same scene from several different angles.

Multiplex _ **a)** Term for the group of compressed video channels multiplexed into single transmission feed. The term "Bouquet" has also been used in this context. _ **b)** To transmit two or more signals at the same time or on the same carrier frequency. _ **c)** The ability to add or remove a pre-recorded lead singer's vocal from cassette tapes, CD+G discs and other Karaoke software. If your Karaoke software contains multiplex recording such as a duet, you can then use this feature to sing either one of the vocals.

Multiplexing _ A process that enables multiple RIPS to drive multiple film recorders.

Multipoint _ A term used by network designers to describe network links that have many possible endpoints.

Multiprocessing _ A computer architecture in which two or more processing units are coupled together to run different programs simultaneously while sharing the same computer frame and memory

MultiRead _ An OSTA (Optical Storage Technology Association) standard for CD-ROM and DVD-ROM drives. Drives that follow the MultiRead standard can read commercial CDs (audio and data), CD-R discs, and CD-RW discs. They can also read CDs written in fixed- or variable-length packets.

Multi-sample _ The creation of several samples, each covering a limited musical range, the idea being to produce a more natural range of sounds across the range of the instrument being sampled. For example, a piano may need to be sampled every two or three semitones in order to sound convincing.

Multiscaning _ Monitors that have a range of horizontal and vertical frequency rates, automatically adjusting themselves to the available signal, as well as being compatible with a wide range of video inputs.

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

Multitasking _ The running of two or more programs in one computer at the same time. The number of programs that can be effectively multitasked depends on the type of multitasking performed (preemptive vs. cooperative), CPU speed and memory and disk capacity. Programs can be run simultaneously in the computer because of the differences between I/O and processing speed. While one program is waiting for input, instructions in another can be executed. During the milliseconds one program waits for data to be read from a disk, millions of instructions in another program can be executed. In interactive programs, thousands of instructions can be executed between each keystroke on the keyboard. In large computers, multiple I/O channels also allow for simultaneous I/O operations to take place. Multiple streams of data are being read and written at the exact same time.

Multitexturing _ A texture map is a single picture layer projected onto a polygon. The process of multitexturing lets a game make further passes over the polygon to add more effects. Possible effects could be a reflection, a colored light, or scorch marks from an explosion. Multitexturing consumes more computing power, of course.

Multithreading _ Multitasking within a single program. It allows multiple streams of execution to take place concurrently within the same program, each stream processing a different transaction or message. In order for a multithreaded program to achieve true performance gains, it must be run in a multitasking or multiprocessing environment, which allows multiple operations to take place. Certain types of applications lend themselves to multithreading. For example, in an order processing system, each order can be entered independently of the other orders. In an

image editing program, a calculation-intensive filter can be performed on one image, while the user works on another. In a symmetric multiprocessing (SMP) operating system, its multithreading allows multiple CPUs to be controlled at the same time. It is also used to create synchronized audio and video applications. Multithreading generally uses reentrant code, which cannot be modified when executing, so that the same code can be shared by multiple programs.

Multitimbral _ Having the ability to produce many different musical timbres (sounds) at once.

Multitrack _ A recording device capable of recording several parallel parts or tracks which may then be mixed or re-recorded independently. In MIDI software, the ability to layer numerous MIDI data streams.

Multi-user _ In information technology, a system that enables more than one user to access data at the same time.

MultiViewer Auto Channel Surf _ Increases the resolution of normal PiP, for the sharpest sub-picture ever. The viewer can easily "surf" other channels in the sub-picture while keeping the main program on the screen.

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

Musepack (MP+) _ An audio format that produces files with better quality than MP3. This file format has the file extension .mpc or .mp+ (older version). Musepack is based on the MPEG-1 Layer 2 standard (mp2), but includes many improvements. It is praised by the audiophiles and currently considered as the highest quality lossy compression audio format. Currently offered for free.

Mute _ Used as a verb, to " mute a channel" means to turn off the audio for that channel. Used as a noun, " mutes" are the buttons which turn off a particular channel. Mutes are usually non-destructive, though not always. Mutes are often automated as part of mixer automation systems.

MVP _ *Multimedia Video Processor* - A high-speed DSP chip from Texas Instruments, introduced in 1994. Officially introduced as the TMS320C80, it combines RISC technology with the functionality of four DSPs on one chip.

N64 _ The Nintendo 64 entered the video game world in 1996. Sales took off in North America thanks to Super Mario 64, hailed by many as "the best game ever." It was the first system with 64-bit graphics and built-in four player gaming potential, features that came together perfectly in the classic James Bond adventure, GoldenEye 007. The Nintendo 64"s software library also earned accolades with titles such as Legend of Zelda: Ocarina of Time and Super Smash Bros. Over 32 million N64 systems were sold worldwide. Nintendo 64 has been superceded by the GameCube,

NAB _ *National Association of Broadcasters* - The National Association of Broadcasters represents the radio and television industries in Washington - before Congress, the FCC and federal agencies, the courts, and on the expanding international front. It also sets standards for US broadcast stations.

Nagware _ Software that periodically prompts the user to register the product. Similar to a nag screen for shareware, nagware is built into a commercial product.

Nanochondria _ Nanoscale devices that are inserted inside the cells of living beings and automatically replicated as the cell reproduces. Named after "mitochondria" found in the cytoplasm of most cells, the purpose of nanochondria is to interact with the cells and communicate to internal and external machines.

Nanosecond (ns) _ One billionth of a second. In this time, electrical pulses travel approximately 12 inches. Also, a measurement of RAM speed.

Nanotechnology _ The science of developing materials at the atomic and molecular level in order to imbue them with special electrical and chemical properties. Nanotechnology, which deals with devices measured in nanometers, is expected to make a significant contribution to the fields of computer storage, semiconductors, biotechnology, manufacturing and energy. Envisioned are all kinds of amazing products, including extraordinarily tiny computers that are very powerful, building materials that withstand earthquakes, advanced systems for drug delivery and custom-tailored pharmaceuticals as well as the elimination of invasive surgery, because repairs can be made from within the body.

Narrowband _ Low-bandwidth (typically dial-up) network connections usually 56 Kbps or lower.

Narrowcast _ Transmission of media to multiple end-users but, as differentiated from *broadcast*, not to everyone on a network.

Native Application _ An application designed to run in the computer environment (machine language and OS) being referenced. The term is used to contrast a native application with an interpreted one such as a Java application that is not native to a single platform. The term may also be used to contrast a native application with an emulated application, which was originally written for a different platform.

Native Digital Editing _ Editing systems featuring Native Digital Editing maintain the quality of the initial material during editing, by retaining the native original format during the editing process to as great an extent as possible. Hence, no unnecessary, avoidable conversions or decompression and recompression steps are implemented with the material played in. Therefore, the best possible picture quality is maintained. Conversions are only implemented when absolutely unavoidable, e.g. in the event that analog material is played in or if dissolves or effects are supposed to be performed with the picture material.

Native Resolution _ Determined by the number of pixels on the screen, this measurement is often prominently advertised with digital sets; it's a quick way to judge the general clarity of the screen. A screen with a native resolution of 1,080 pixels up and down and 1,920 pixels side to side will certainly project sharper images than one that has just 480-by-720 pixels. Some TVs are able to do more with what they've got. For instance, digital sets that display 720 active scan lines in a progressive format look as good as those that show 1,080 lines in an interlaced format. Although there are fewer scan lines, the progressive pattern increases the definition. A good measurement of clarity is to take a long, subjective look at the quality of images on a screen, as well as to test for horizontal resolution.

Near End _ In video conferencing, the party or group at the local end of the connection.

NEF _ *Nikon Electronic Format -* Raw image data file format used by the Nikon digicams.

Negative _ A term applied to images where the luminance values are inverted, i.e., all colors are represented by their corresponding complementary color value.

Netiquette _ The computer world's equivalent of etiquette. The informal, largely undocumented, unregulated set of rules designed to make the Web a polite and civilized society to belong to.

NetPC _ *NETwork PC* - Introduced in 1997, it is a Windows PC that downloads all installations of Windows and applications from the server. The software remains on the hard disk, but program versions are monitored by a management server. Floppy and/or CD-ROM drives are optional and may be restricted to prevent user installations. NetPCs can alternatively be configured as thin clients, in which case the OS is booted from the network each time it is turned on, and all applications and data come from the server. The local hard disk is used for caching parts of the application during the day to improve performance. NetPCs must conform to the NetPC Design Guidelines, which include the management capabilities of Intel's Wired for Management Baseline Specification.

Netscape Navigator _ The alternative to Microsoft's Internet Explorer.

Netshow _ Microsoft NetShow is a service that runs on Windows servers, delivering the high-quality streaming multimedia to users on corporate intranets and the Internet. It consists of server and tools components for delivering audio, video, illustrated audio, and other multimedia types over the network.

Netware _ A term applied to software for networking.

Network _ A group of computers connected to communicate with each other, share resources and peripherals. Internet is effectively a world-wide network of networks.

Network layer _ a) In TCP/IP, the network layer is responsible for accepting IP (Internet Protocol) datagrams and transmitting them over a specific network. _ **b)** The third layer of the OSI reference model of data communications.

Network Time Protocol _ An Internet protocol that ensures that the correct time is transmitted, when requested.

Network Time Server _ The dedicated computer that supplies the correct time via Network Time Protocol.

Networking _ Two or more devices (or people) communicating with each other and sharing resources.

Newbie _ The first-time user of computers or of a particular environment, such as Windows or Unix. The term is often used for newcomers to the Internet.

Newsgroups _ There are thousands of these in existence, distributing information on every subject imaginable. They are Internet based message areas or discussion groups, usually organized by subject hierarchies (i.e. topics of interest). The collective term used for Newsgroups is Usenet.

Newsreader _ Any program or application that allows the user to read Newsgroup messages on the Usenet service.

NFS _ *Network File System* - Developed by Sun Microsystems NFS allows sets of computers to access each other's files as if they were locally stored. NFS has been implemented on many platforms and is considered an industry standard.

Nibble _ 8 binary bits = 1 Byte 4 binary bits = 1 Nibble

Ni-Cad _ Nickel Cadmium, type of rechargeable battery. Nicad was the original type of rechargeable battery and has been pretty much replaced by the NiMH type. These batteries have high energy density (50% more than Ni-Cd) and can be charged over 500 times in their life cycle. They charge very fast and hold their energy longer than other batteries. When they are disposed of they have a low environmental impact

NICAM _ Near Instantaneously Companded Audio Multiplex. This digital audio system, used in Europe, uses compression techniques to present "very near CD" quality stereo into the transmitted TV signal. For a long time television sound has been considered the poor relation of the pictures. Now with digital transmission it is better to listen to a properly equipped TV than to the radio!

NightShot _ Sony's original '98 feature: by switching the infrared cut-off filter, the camera is capable of recording in complete darkness (0 Lux!). The infrared beam is additionally emitted from the camera.

**Ni-MH battery _ *Nickel-Metal Hydride* **battery. Rechargeable batteries that have an energy density 100% higher than NiCd batteries, can supply high energy levels when required, and has been touted as having no memory effect as is common with Nicad type batteries when they are charged before they have been fully discharged. They can be recharged more than 300 times and are environmentally-friendly (free of cadmium and mercury). Among other devices, Ni-MH are used to power digital cameras.

Nintendo Entertainment System _ (NES) This was the Nintendo's first and most successful video games console to date and it is estimated that more than 60 million NES consoles have been sold world-wide. The machine is based on 8 bit technology but represented a true leap in technology when introduced in 1985. The NES spawned a variety of interesting accessories, from R.O.B. the robot to the Power Pad controller. It was superseded by the SNES (Super Nintendo Entertainment System) in 1990 and is no longer made or supplied.

Nit _ a) The smallest measurable unit of brightness that is used to measure the brightness of the surface area of a monitor, LCD or other display device. _ **b)** Short for Network Information Table, NIT is commonly used to describe a table listing network information. _ **c)** Short for Network Interface Tap, NIT is a network device driver included with the SunOS used to capture packets only received by the interface. _ **d)** Term used to describe a small and unimportant imperfection with a product.

**NLE _ *Non-Linear Editing* **- A way to edit videos on the computer that allows the editor to move pieces of video like they are sentences in a word processor document. NLE allows for easy addition of sounds, narration, titles, graphics, and video.

**NNTP _ *Net News Transport Protocol* **- Usenet news uses this transfer protocol for moving files around a network.

Node _ Any single computer connected to a network.

Noise (random) _ Irregular level fluctuations of a low order of magnitude. All analogue video signals contain random noise. Ideally for digital sampling, the noise level should not occupy more than one LSB of the digital dynamic range. Pure digitally generated signals however do not contain any noise - a fact that can be a problem under certain conditions. Generally in ITU-R BT.601 systems fine noise is invisible; coarse or large area noise may be perceptible under controlled viewing conditions. With digital compression, noise has a new importance. Noise can appear as high frequency information and is difficult to tell apart from the wanted signal. Noise is the enemy of digital compression.

Noise _ Any unwanted signal, such as in audio and video that adversely affects the quality of the picture or sound.

Noise Reduction _ Usually performed by an electronic device, the attempted reduction of noise during recording or playback.

Noise Shaping _ A system for creating digital dither such that any added noise is shifted into those parts of the audio spectrum where the human ear is least sensitive.

Noise-canceling _ A microphone designed to cancel ambient noise so that it will not be broadcast or recorded. The housing of the microphone allows noise to reach both sides of the diaphragm simultaneously, one side canceling the other out. A close speaking voice strikes the diaphragm on only one side, generating a stronger signal with less background noise.

Non-additive Mix _ A mix of two pictures which is controlled by their luminance levels relative to each other, as well as a set mix value K (between 0 and 1) - e.g. the position of a switcher lever arm. A and B sources are scaled by factors K and 1-K but the output signal is switched to that which has the greatest instantaneous product of the scaling and the luminance values. The output of any pixel is either signal A or B but not a mix of each. So if K = 0.5, where picture A is brighter than B then only A will be seen. Thus two clips of single subjects shot against a black background can be placed in one picture. The term has also come to encompass some of the more exotic types of picture mixing available today - for example to describe a mix that could add smoke to a foreground picture - perhaps better termed an additive mix.

Non-blocking Matrix Switchers _ These are true matrix switchers allowing any input to switch to any or all outputs. They have no switching limitations contingent on hardware or software.

Non-composite Video Signal _ A video signal that contains picture and blanking information only, with no sync information.

Non-drop Frame _ Strictly speaking, NTSC does not work at a frame rate of 60 Hz, but of 59.94 Hz. This corresponds to 29.97 frames per second. Due to this uneven figure, problems may arise in relation to the timecode. The 0.03 fields which are missing per second, add up to form whole pictures, leading to a mismatch between the timecode value and the number of frames. In technical terms, this problem is solved by using the drop frame procedure. In this process, two frames are simply left out per minute. The time mismatch which would normally occur is thus prevented. However, it is also possible to operate NTSC recorders in the non-drop-frame mode. In this case all 30 frames are displayed and the described time displacement occurs.

Non-drop Frame Timecode _ Timecode that does not compensate for the 29.97 frames of video per second of NTSC video, rather than 30 frames per second. Each frame is assigned a unique, consecutive SMPTE time code.

Non-interlaced _ Also called progressive scan. A method by which all the video scan lines are presented on the screen in one pass instead of two.

Non-linear Editing _ Random-access editing of video and audio on a computer, enabling edits to be processed and reprocessed at any point in the timeline, at any time. Traditional videotape editors are linear because they require editing video sequentially, from beginning to end. Non-linear means not linear - that the recording medium is not tape and editing can be performed in a non-linear sequence - not necessarily the sequence of the program. It describes editing with quick access to source clips and record space - usually using computer disks to store footage. In the course of editing, contrary to popular view, clips are not actually moved - they are just accessed in the different running order. This removes the spooling and pre-rolls of VTR operations so greatly speeding work. Yet greater speed and flexibility are possible with real-time random access to any frame (true random access).

Nonlinearity _ What goes into a system comes out changed by its passage through that system; in other words, distorted. The ideal of an audio component and an audio system is to be linear, or nondistorting, with the image on one side of the mirror identical to the image on the other side.

Non-lossy (a.k.a. lossless) _ Term that refers to data compression techniques that do not remove image data details in order to achieve compression. This method is generally less effective than lossy methods in terms of resulting file size, but retains the entire original image.

Non-real Time _ faster or slower than real time. If referring to DSP processes, "non-real time" means that the system will perform a one-off calculation in order to create (render) a file containing the processed region. Whenever the sequence containing the process is played, the system will seamlessly jump to this file at the appropriate moment. Such a system does not require as much DSP power as one which performs the process live (i.e. in real time), but the drawback is that the processed file uses up disk space and the initial calculation takes time.

Non-segmented _ A system of video recording that uses one head to scan one field of video on the tape.

Non-Volatile Memory _ A type of memory that retains information when power is turned off. ROMs, PROMs, EPROMs, EEPROMs and flash memory are examples. Disks and tapes could be called non-volatile memory, because they hold their content without power being applied, but they are usually considered storage devices. Camera Memory Cards (Compact Flash, SmartMedia, etc.) use non-volatile memory

Normal _ A vector that defines the orientation of a plane or a vertex.

Normalization _ An automatic process available in most audio software whereby the gain of all program material is adjusted so the peak level will just arrive at 0 dBFS. Normalization can be extremely damaging to your digital audio if misused. The first serious peril is that it is a mistake to use normalization to try to correct the apparent loudness of different songs on an album. In many cases, normalization may aggravate an existing condition. The second peril of normalization is that the very process of changing gain can add a veil or truncation distortion if improperly done.

NOT _ By including this term into the address bar of your browser the search enquiry will only find the word preceding NOT. For example ~ If looking for let's say - watches NOT clocks, you will be presented with Web pages that contain the word watches but pages that contain both words will not appear.

Note _ Drives that have the official MultiRead logo have been tested for compliance with the MultiRead specification. Drives labeled as "multi-read" (without the logo) probably have not been tested for compliance with the specification, and may not be able to read CD-RW or packet-written CDs.

Note on Commands _ a channel voice message that indicates a note is to begin sounding. Contains two additional data bytes -note number and Note velocity.

Notebook _ What the policeman writes your name in when you report a crime. Also, a small portable computer that is usually the size of an A4 notepad. It has many of the features of a desktop computer and is often favored by business users as a means of keeping in touch with their office whilst traveling around the country. Also very handy if you're a college student, or if you have a long train journey home each day and want to put the time to good use.

NTSC _ An acronym for "National Television Standards Committee." NTSC is the color television system used in the USA, Canada, Mexico and Japan where NTSC M is the broadcast standard ("M" defines the 525 line/60 field format, but usually the standard is just referred to as NTSC). The bandwidth of the NTSC system is 4.2 MHz for the luminance signal and 1.3 and 0.4 MHz for the I and Q color channels.

NTSC _ *Never Twice the Same Color*, what US TV looks like to a PAL viewer

NTSC Decoder _ An electronic circuit that breaks down the composite NTSC video signal into its components. It's the receiver side of the encode, decode process used to compress three channels of color information into one, then expand it back to the three channels required for viewing. There are two basic types of decoders, Comb Filter and Notch Filter. In order to meet the guide lines set out for compatibility with black and white TV's, NTSC composite color signal contains a black and white signal plus the two additional channels of color information needed to derive red, green, and blue. Each of the two channels of color information ride along with the black and white on their own 3.58 MHz subcarrier. The black and white information exists in frequency space all the way through and past the color information and its sidebands. The first stage of decoding is to separate the color 3.58 MHz carriers and their information from the black and white. This is required not only in TV sets but in consumer VCR's. In the early days of decoding NTSC, we couldn't build inexpensive circuits that would allow us to preserve the black and white information occupying the area of the color signal. We used a simple circuit called a **Notch Filter** to break these two signals apart. Everything around 3.58 MHz was treated as color information and all else was treated as black and white. Since that essentially means that there was no high frequency detail in the black and white, the Sharpness control was added to your set to eke out every last bit of detail left after the notch filter had done its damage.

NuBus _ Communications interface used in Macintosh computers to transfer video data from memory to the graphics display card.

Nuon _ a technology that adds additional features to a DVD player. In addition to viewing DVD's, you can play 128-bit games, use enhanced DVD navigation tools, gain access to DVD-ROM features that would normally be only available via a personal computer, playback CD's while the Nuon graphics processor generates synchronized graphics on your monitor, and more. There are plans to provide internet access capability in the next generation of Nuon-equipped DVD players.

NURBS _ *Nonuniform Rational B-Spline* - A type of spline used to create curved surfaces.

Nvidia _ A leading designer of games oriented 3D graphics technology

NVOD _ *Near video on demand* - Rapid access to program material on demand achieved by providing the same program on a number of channels with staggered start times. Many of the hundreds of TV channels soon to be on offer will be made up.

Nyquist frequency (Nyquist rate) _ The lowest sampling frequency that can be used for analog-to-digital conversion of a signal

without resulting in significant aliasing. Normally, this frequency is twice the rate of the highest frequency contained in the signal being sampled.

Nyquist sampling theorem _ Defines the process of sampling audio with a digital system. Among other things, it states that the sampling frequency of a digital audio system must be at least twice that of the highest audio frequency, otherwise aliasing will occur. The Nyquist theorem was developed at Bell Labs by C. Shannon and H. Nyquist.

Object Code _ A series of numbers representing microcode instructions which can be performed by the particular processor chip for which the code has been compiled. The same source code will produce different object code when compiled for e.g. the Intel 80x86 or the Motorola 680x0 families of chips.

Object Oriented _ Vector software that allows the user to define objects, i.e., images, line art ,text, etc. and manipulate the objects for placement in page layout or other creative graphics program.

Object Oriented Graphics _ There are two kinds of computer graphics: Bit Mapped and Object Oriented. You create object oriented graphics in a drawing program. When you create objects in a drawing program, you can still edit them after you have done something else. For example, if you draw a circle in one place, then draw a rectangle in another place, you can still select the circle and change its size and location. This is possible because object oriented graphics are stored as dimensions and formulas, unlike bit mapped graphics which are stored as individual pixels. When a drawing program opens a drawing file, it will look for objects, not pixels. A drawing file may be thought of as a series of instructions like the ones below, but in a computer language which most normal people can not understand - / *Draw a circle at the point that is 100 pixels to the right and 140 pixels down from the top-left corner of the screen with the radius of 25 pixels/* There are advantages as well as disadvantages to object oriented graphics over bitmapped graphics. As already mentioned, object oriented graphics can still be modified as separate objects after being modified, unlike bitmapped which can't. Second, object oriented graphic files (drawing files) are usually much smaller in size than bitmapped graphics. Third, you can enlarge a object oriented graphic to any size, and it will not loose detail. That is because most object oriented graphics are resolution-independent. A disadvantage is that there are usually harder to create, and can not have many interesting special effects done to them, such as blurring for example.

Object Technology _ A methodology for designing and programming information systems. Object technology differs from traditional system design which separates the data from the processing. Although data and processing are naturally related since software causes the computer to process data, the traditional approach has been to design the databases separate and apart from the processing routines, often using different modeling and documentation tools. In object technology, which is implemented using object-oriented programming tools, information systems are designed as building blocks that contain both the data and the processing (the "attributes" and the "methods"). The concept of object technology is that this approach is a more natural way of designing systems and one that makes it easier to apply future enhancements. The ability to reuse existing objects is considered a major advantage.

Object-oriented Programming _ Abbreviated "OOP," programming that supports object technology. It is an evolutionary form of modular programming with more formal rules that allow pieces of software to be reused and interchanged between programs. Major concepts are encapsulation, inheritance and polymorphism.

OC3 _ *Optical Carrier Level 3* - A 155 Mbps ATM SONET signal stream that can carry three DS3 signals.

Occlusion _ The effect of one object in 3-D space blocking another object from view.

OCR _ *Optical character reader* or optical character recognition. Hardware and software that reads characters as images and converts them into text to be used in a computer. When a text document is scanned into the computer, it is turned into a bitmap, which is a picture of the text. OCR software analyzes the light and dark areas of the bitmap in order to identify each alphabetic letter and numeric digit. When it recognizes a character, it converts it into ASCII text. Hand printing is much more difficult to analyze than machine-printed characters. Old, worn and smudged documents are also difficult. Scanning documents and processing them with OCR is sometimes as much an art as it is a science.

Octave _ A frequency ratio of 2:1. A musical distance (interval) of 12 semitones. When a frequency or pitch is transposed up by one octave, its frequency is doubled.

OEB _ _Open eBook_ - An open standard for e-book content. OEB publications are not read directly by the e-book. They must be compiled into the proprietary format of the e-book, which applies encryption and other optimization techniques required by the hardware. OEB supports the unique features of e-books such as different window sizes and unlimited scrolling lengths, requirements that are not addressed in page description languages intended for paper output. Any publication formatted in OEB can be readily converted for use by a variety of e-book hardware.

OEM _ _Original Equipment Manufacturer_ Means that the piece of equipment is made by one company but labeled for and sold by another company.

Offline _ a) When no disk file exists for a reference to a clip in a program, the file is said to be off line. **_ b)** When your computer performs an operation and it's not connected to the Internet or any other computer at the time of performing this operation, then it is deemed to be working "offline". **_ c)** Process performed while a recording is not playing. For example, some computer-based processes have to be performed off-line as the computer isn't fast enough to perform the process in real-time.

Off-line Editing _ A decision-making process using low-cost equipment usually to produce an EDL or a rough cut which can then be conformed or referred to in a high quality on-line suite - so reducing decision-making time in the more expensive on-line environment. While most off-line suites enable shot selection and the defining of transitions such as cuts and dissolves, very few allow settings for the DVEs, color correctors, keyers and layering that are increasingly a part of the on-line editing process.

Ogg _ the umbrella for a group of several related multimedia and signal processing projects that are open source and royalty free. Development of these projects is controlled by Xiph.org. First and best-known project of these is called _Ogg Vorbis_, a royalty-free audio compression technology. Other projects under development include _Ogg Tarkin_ (a video codec) and _Ogg Theora_ - a project that aims to integrate Ogg's VP3 video codec.

OHCI _ _Open Host Controller Interface_ - a type of Firewire card that does not need additional software or drivers. The OHCI firewire drivers comes preinstalled with most operating systems, so a card designed with the OHCI spec will work without loading extra software.

OLE _ _Object Linking and Embedding_ - A standard for combining data from different application that updates automatically. OLE allows an object such as a graphic, video clip, spreadsheet, etc. to be embedded into a document, called the "container application." If the object is playable such as a video, when it is double clicked by the user, a media player is launched. If the object is allowed to be edited, the application associated with it (the "server application") is launched.

OLED _ _Organic Light Emitting Diode_ - Newly developed display technology that could replace LCD. OLED does not require a backlight like LCD displays and therefore is more energy efficient which is important to battery operated portable devices. It also offers increased contrast and a better viewing angle which means it can be more easily viewed in bright (sunlight) conditions.

Omake _ A Japanese word meaning "bonus" or "extra." The word is often used in Japanese video games to describe an extras section that contains character sketches, design documents, sound tests, etc. Such sections usually appear in anthologies or compilations of older games. The goodies in the Final Fantasy Anthology version of Final Fantasy VI are an omake section.

OMF _ _Open Media Framework_ - A file type for post production interchange of digital media. It supports video, audio, graphics, animation and effects as well as edit decision information.

OMFI _ _Open Media Framework Interchange_ is an open standard for post production interchange of digital media among applications and across platforms. It describes a file format and supports video, audio, graphics, animation and effects as well as comprehensive edit decision information. Transfer may be by removable disk or over a high-speed network or telephone line to another location.

Omni _ Meaning all, refers to a microphone that is equally sensitive in all directions, or to the MIDI mode where data on all channels is recognized.

On Demand _ Media which is not transmitted live, as it is recorded, but is made available as an archive on a server, for end-users to access when they wish. A television broadcast is "live;" renting a video and watching it at home is "on-demand."

On Disk _ The media file for a clip is stored on a hard drive and referenced from within a program.

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

Onboard _ Refers to a chip or other hardware component that is directly attached to the printed circuit board (motherboard).

On-demand Streaming _ Streaming media content that is transmitted to the client upon request.

Onionskinning _ Onionskinning is a term that commonly refers to a graphic process in which an image or an animation is composed of a couple of different layers. For example, if you have ever used Adobe Photoshop 3.0 or higher you are probably familiar with the layers window. That is exactly what onionskinning is all about. Imagine it as a series of totally transparent pieces of plastic with different drawings on them. When they are all stacked on top of another, a composite is formed. This is widely used in traditional animation when the background is a separate layer and each character is a separate layer. This way, only layers have to be redrawn or repositioned for a new frame. Onionskinning is also found in computer software where different effects can be placed on different layers and later composited into a final image or animation.

Online _ Available for immediate use. It typically refers to being connected to the Internet or other remote service. When you connect via modem, you are online after you dial in and log on to your Internet provider with your username and password. When you log off, you are offline. With cable modem and DSL service, you are online all the time. A peripheral device (terminal, printer, etc.) that is turned on and connected to the computer is also online.

Online Banking _ This is becoming increasingly popular and is yet another way to conduct your account with your bank by using your computer.

On-line editing _ Production of the complete, final edit performed at full program quality - the buck stops here! Being higher quality than off-line, time costs more but the difference is reducing. Preparation in an off-line suite will help save time and money in the on-line. To produce the finished edit, on-line has to include a wide range of tools, offer flexibility to try ideas and accommodate late changes, and to work fast to maintain the creative flow and to handle pressured situations.

Online Service Provider _ This is one that creates a whole community by offering first time Internet users localized content, topical news and a range of useful search engines, all as a very attractive fully comprehensive package. It's only when you get more experienced on the Web that you may decide to break away from one of these and be a bit more selective as to exactly what you do online.

OO _ *Object Oriented* - A prefix that means "object-oriented." For example, OOP means "object-oriented programming." The acronym used by itself and not as a prefix would more accurately mean "object orientation," which refers to the object-oriented world in general.

Opacity _ The degree of translucency of a pixel. An opacity setting is used most often with keyed images. Usually an opacity value of 0 would be a completely transparent image; a value of 100 would be a completely opaque image.

Open Architecture _ a) Computers that are not locked into one hardware supplier or programming language. **_ b)** A modular system designed that allows for expansion of the existing configuration by interfacing additional software or other manufacturers" products.

Open Cable _ A project aimed at obtaining a new generation of set-top boxes that are interoperable. These new devices will enable a new range of interactive services to be provided to cable customers.

Open Standard _ A platform based on cooperative standards set by the motion picture industry, creative community, exhibitors, technology enablers, service providers and other entertainment industry leaders. The technology pieces are made available to other industry manufacturers to develop and produce interoperable equipment and systems, assuring the industry of a multi-source, open systems architecture solution.

Open Systems _ Hardware and/or software systems that use open standards. For years, open systems and Unix were synonymous, because Unix was made to run on more kinds of computers than any other operating system. Starting in the mid-1990s, Linux, the latest evolution of Unix, as well as Java have become models for open systems/open standards. Because thousands of companies make PCs, the PC has been called an open system in contrast to the Macintosh, which is made by only one company (Apple Computer). However, because of the tight control Microsoft and Intel have over the PC, many would argue that the PC is not entirely open.

OpenGL _ An open graphics API originally developed by SGI. It's used with many video adapters for many 3D applications, from games to high-end CAD.

Operating System _ The base program that manages a computer and gives control of the functions designed for general purpose usage - not for specific applications. Common examples are MS-DOS, Windows and Linux for PCs, Mac OS for Apple Macintosh and UNIX. For actual use, for example as a word processor, specific applications software is run on top of the operating system. While general purpose operating systems allow a wide range of applications to be used they do not necessarily allow the most efficient or fastest possible use of the hardware for the application.

Optical Digital Audio Output _ Enables digital-to-digital connection for outboard Dolby DigitalTM decoding, dts decoding or PCM audio D/A conversion.

Optical Disks _ A storage medium from which information is read by a laser. An optical disc is usually recorded using a laser. A master optical disc can be replicated by other means. Laserdiscs, CD's and DVD's and their variations are examples of optical discs. These offer large storage capacities on a small area, being removable and having rather slower data rates than fixed magnetic disks - but faster than floppies. Write Once, Read Many or "WORM" optical disks first appeared with 2 GB capacity on each side of a 12-inch platter - useful for archiving images. In 1989 the read/write magneto-optical (MO) disk was introduced which can be re-written around a million times. With its modest size, just 51/4-inches in diameter, the ISO standard cartridge can store 325 MB per side -

offering low priced removable storage for over 700 TV pictures per disk. A variant on the technology is the phase change disk but this is not compatible with the ISO standard. An uprated MO disk system introduced in 1994 has a capacity of 650 MB per side, 1.3 GB per disk. In 1996 a second doubling of capacity was introduced offering 2.6 GB on a removable disk. 5.2 GB disks became available in 2000.

Optical Fiber _ A thin glass strand designed for light transmission. A single hair-thin fiber is capable of transmitting trillions of bits per second. In addition to their huge transmission capacity, optical fibers offer many advantages over electricity and copper wire. Light pulses are not affected by random radiation in the environment, and their error rate is significantly lower. Fibers allow longer distances to be spanned before the signal has to be regenerated by expensive "repeaters." Fibers are more secure, because taps in the line can be detected, and lastly, fiber installation is streamlined due to their dramatically lower weight and smaller size compared to copper cables. An optical fiber is constructed of a transparent core made of nearly pure silicon dioxide (SiO2), through which the light travels. The core is surrounded by a cladding layer that reflects light, guiding the light along the core. A plastic coating covers the cladding to protect the glass surface. Cables also include fibers of Kevlar and/or steel wires for strength and an outer sheath of plastic or Teflon for protection.

Optical Resolution _ is an absolute number that the camera's image sensor can physically record.

Optical Scanner _ A device that analyzes the light reflected from or transmitted through copy, art or film and processes an electronic signal proportional to the intensity of the light or color. Each picture element is converted to a number.

Optical Storage Media _ The basic principle of optical disks such as CD and DVD is the same - a disk of transparent polycarbonate is vaporized on one side with reflective coating and coated with wafer-thin varnish. In the polycarbonate disk a helical, narrow-wound Track extends from the inside to the outside through the plastic. On this Track, digital information in the form of lands and pits are lined up one behind the other. Each transition, irrespective of its direction, stands for a

digital 1; the absence of a transition represents a digital 0. The windings of the data spiral are 1.6 mm apart; thus 50 windings would be as wide as a single human hair. The individual pits are between 0.8 and 1 mm. When played, the disk rotates while an axially mobile scanner unit follows the data Track. This combined scanner unit consists of a laser diode and a lens with a photodiode at the back. The laser beam of the laser diode is thrown back by the reflective rear side coating of the CD. If the beam hits the lands, it is directly reflected into the lens system at high intensity, while the pits, by contrast, scatter the beam and only a little light falls on the photodiode. The changing intensity of the reflected light impulses therefore reproduces the bit Sequence or data stream.

Optimum Power Calibration Area _ A special area near the center of the recordable CD. Before writing a track on a CD, the CD-Recorder must adjust the amount of power applied to the writing laser to an optimum level for each individual CD. The optimum calibration area is reserved for this purpose.

Option _ This is one of the few Internet terms that's similar to it's dictionary description i.e. your right to choose. Every time you open up a menu you choose an option which activates or completes a task. Sometimes you'll see a keyboard shortcut indicated alongside the text for that option. Other times you'll see a toolbar icon displayed. This is the computer's way of informing you that if you click on the appropriate toolbar icon the same option will be selected.

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

ORF _ *Olympus RAW format* - The unprocessed image format created by Olympus for some of its digicams.

Organic Light Emitting Diode (OLED) _ The principle behind OLED display technology is when a thin film of organic material such as carbon, oxygen, or hydrogen receives an electrical charge it emits a photon of a certain color. The only problems with this type of display currently is the limited life time due to organic decay.

Organic Wipe _ A wipe effect that uses a grayscale gradient pattern to switch from one image to another by gradually revealing the second image according to the pattern.

Origin _ High(est) Definition Camera project by Dalsa. At its heart is a single 35mm-sized, progressive-scan, 8-megapixel, frame-transfer CCD (frame-transfer means it requires a mechanical shutter like Thomson's Viper). Its large, light-sensitive pixels form a 4Kx2K (4046 x 2048) array that's four times the resolution of HD. Native aspect ratio is 2:1; frame rates from 0fps to 60fps; dynamic range 14-bit per color. It is equipped with a PL mount for conventional 35mm motion picture lenses. Color is formed by an RGB color-matrix Bayer filter.

Original _ The tapes which were used for the initial recording, are referred to as the original or original tapes. In most cases, original tapes are produced by the camcorder or the studio recorder in the case of studio productions or film scanning. The best scenes of the original tapes are selected during editing, compiled to the finished film and recorded on the master.

OriginC+ _ masterclock, timecode comparator and independent 1ppm timecode generator; used for initialization and monitoring of timecode equipment during a production.

OS _ An *Operating System* (OS) is the system software that functions as a mediator between hardware and application programs, thereby providing an environment that enables people to use computers. The fundamental tasks of an OS are to manage the data filing system, memory and peripheral devices, and provide the user interface and Application Programming Interface (API) that can be utilized by application programs and utility software. In other words, an OS controls hardware, including the computer itself and peripheral devices, and creates an environment for running application programs. In addition to these functions, which are not immediately obvious to users, an OS also sets up an interface environment through which users can interact with the computer. Modern operating systems, such as Windows and Mac OS, are equipped with a multitasking function which lets the computer run multiple applications simultaneously. They also offer a Graphical User Interface (GUI) that allows the user to operate a computer by manipulating graphics-based information with a pointing device such as a mouse. Common PC operating systems include Microsoft's MS-DOS, Windows 95/98, Windows NT, IBM's OS/2 Warp and Apple Computer's Mac OS. UNIX is the most prominent OS for workstations.

Oscillator _ An electronic device capable of generating a recurring waveform, or a digital process to generate the same.

OSI _ *Open Systems Interconnection* - A description of how messages are to be transmitted between any two points in a tele-communication network. OSI was developed to promote interoperability between different types of products.

OSTA _ *Optical Storage Technology Association* - This association is composed of major optical drive manufacturers. Its purpose is to endorse standards and promote the use of optical media.

Otaku _ A Japanese word that refers (derogatorily in Japanese culture, but less so in other cultures) to an obsessive, geekish fan of an entertainment product, such as anime or video games. In many cases, the "otaku" label is picked up by international anime and gaming fans as a medal of honor that signifies their devotion.

OTP _ *Opposite Track Path* - A 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. OTP 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 PTP format where random access time is more important.

Output _ A "catch all" term applied to transferring electronic data. It may be files, film, prints, tape, discs, etc. Output devices are drives, printers, plotters and recorders.

Output Device _ Hardware that converts digital information into viewable, readable, or aural form, such as a printer, monitor, film recorder or video recorder.

Overclock _ To speed up the computer beyond the manufacturer's specifications in order to run faster. This is accomplished by changing a jumper on the motherboard or by changing the clock crystal. The motherboard and CPU may or may not be able to handle the increased speed.

Overcranking _ A process based on the film camera technique of recording frames faster than the anticipated playback rate to create

"slow-motion". This process provides unique control of motion images in the camera where motion-blur and other techniques can be incorporated in the process. Panasonic has developed an electronic recording system capable of over/undercrank recording using a process that produces results very much like the film technique. This Panasonic system is known as "VariCam." Sony has utilized a system where interlaced frames can be interpolated to create progressive frames, creating a look of overcranking.

Overlay _ Video overlay enables the display of full-motion video on monitor screen without the constraints of the video BUS speed. The overlay can be either digital (e.g. an .AVI-file or DVD-Video) or analog (e.g. real-time NTSC or PAL video from a video capture board). The analog signal is first decoded to a digital format by the capture board, stored into a frame buffer, and then fed directly to the graphics processor's RAMDAC. When using video overlay the CPU does not have to process any of the video information saving valuable processing power for actual applications.

Overlay Surfaces and Colorspace Conversion _ Your computer monitor uses a color system called RGB to display an image, however DVD and MPEG titles use a YUV system because it can be compressed better with less quality loss. The offside to this is that you need more CPU power to convert the YUV stream to RGB before it can be displayed on your screen. This problem was first introduced when MPEG-1 become popular. At that point various hardware vendors started to incorporate hardware YUV➔GB conversion into their cards. This hardware conversion was implemented into an Overlay design. An overlay is sort of a window that doesn't take your current color mode into account and always displays in 24bit true color. If your video card supports overlays you can see what I mean by switching to an 8bit (256 color) mode and playing a DVD title using CineMaster. You will see that while everything in windows is 256 color, the DVD playback windows is 24bit true color. Another upside to Overlays is that they can do hardware scaling of the overlay stretching it to any size without taking any CPU power. They also use a bi-linear stretching code which gives a smoother picture when stretching the image. Without a display adaptor that supports overlays, most of the DVD software

decoders will simply not work, or work A LOT SLOWER taking a CPU hit because they need to do the YUV➔RGB conversion themselves.

Overload _ A condition in which a system is given too high an input level. A common cause of distortion or product failure.

Oversampling _ A digital filtering technique used in CD components. Extra data points are added to the audio read from a disc, creating a signal that is some multiple (usually two, four, or eight times) of the CD format's standard sampling frequency. This process raises the frequency of any false information, which can then be removed by an analog filter. Using the high sample rate, the digital data may be processed with a very steep slope digital filter. As the filter is in the digital domain, unpleasant side-effects, such as phase effects are eliminated.

Overscan _ This term describes the active image area in a video picture that is outside the edges of the display device. Overscan first came about because it was felt that consumers wanted the entire image area of their screen filled with picture information. To accomplish that reliably it was necessary to push the outside edge of the active picture area of the video signal out beyond the edge of the display area. In the early days of television set construction, where parts tolerances and AC line voltage fluctuations would influence how much of the image went out beyond the edge of the picture area, it was decided to loose 5% of the image on each edge. This became the average or targeted Overscan. In some cases it could go as high as 10%. Program producers had to be aware that image information at these outside edges might not be seen by the majority of the viewers so they established a reference for themselves. The area inside a 5% line around the edges of the picture was called the "Safe Action" area. The area inside 10% lines was called "Safe Title".

Over-the-air Broadcast _ Also called Terrestrial Broadcast. It is the delivery of TV and radio signals using UHF/VHF frequencies. Broadcasts may be either analogue or digital.

P

P frames _ One of the three types of frames used in the coded MPEG-2 signal. These contain only predictive information (not a whole picture) generated by looking at the difference between the present frame and the previous one. They contain much less data than the I frames and so help towards the low data rates that can be achieved with the MPEG signal. To see the original picture corresponding to a P frame a whole MPEG-2 GoP has to be decoded.

P2P _ *Peer-to-peer networking* - popularized in late 1990s by Napster. Unlike regular network, where all the clients make requests to one specific central server, the P2P network model makes the download requests to other clients. Basically once an user logs into P2P network he/she is immediately a client and a server simultaneously. User can download files from other users and other users can download files from the user. P2P network model can also be used in various other ways other than distributing just files. One of the best-known P2P networking projects (although it is not pure P2P network, because clients don't communicate with each other) is called SETI@Home where users use their own home computers to calculate portions of massive data amount received by radio telescopes from outer space, in order to find extraterrestrial life. Also, we should mention that original Napster network wasn't pure P2P network either, because all download requests were passed through a centralized server maintained by Napster - this ultimately was one of the aspects which lead to closure of Napster in early third millennium. Shortly after Napster gained its peak popularity, several pure P2P networks emerged, most important of those new-breed P2P networks is/was definitely a network called Gnutella.

Pack _ **a)** A set of clips, mattes and settings for DVE, color corrector, keyer, etc. that are used together to make a video layer in a composited picture. _ **b)** A group of MPEG packets in a DVD-Video program stream. Each DVD sector of 2048 bytes contains one pack.

Package _ The container used to encapsulate a semiconductor chip

Packet _ **a)** 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. _ **b)** Although computers and modems can send data one character at a time, it's more efficient to send information in larger blocks called data "packets," or *datagrams*. When using the standard Internet protocol, TCP/IP, packets are typically around 1,500 characters. Packets consist of the data being transmitted plus the IP address information of the sender and the recipient

Packet Writing _ A method of writing data on a CD in small increments (contrast with Track-at-Once and Disc-at-Once). Packets can be of fixed or variable length.

Pager _ A small device often carried in your pocket or on your waistband which is capable of receiving text messages.

Paint Software _ A graphics program that allows the user to simulate painting on the computer with a mouse or tablet. The images that are generated in a paint program, which are made up of dots, are called "bitmapped graphics" or just plain "bitmaps." Unlike drawing programs, which generate vector graphics images, the picture objects created in a paint program cannot be easily isolated and scaled independently. Bitmapped graphics are much like a painted canvas as objects are "painted" together. However, colors can be changed and parts or all of an image can be run through image filters to create a wide variety of special effects. Full-featured paint programs are called "image editors." They include a variety of image editing capabilities for enhancing scanned images, which are also created as bitmaps. If the image editor contains layers, then bitmap elements can be placed into different layers and treated independently like drawing programs.

PAL _ PAL stands for *Phase Alternation Line*, *Picture Always Lousy*, or *Perfect At Last* depending on your viewpoint. Technically, PAL is just a color modulation scheme. To fully specify the color video signal it should be referred to as (B, D, G, H, I, M, N, or CN) PAL. (B, D, G, H, I) PAL is the color video standard used in Europe and many other countries. (M, N, CN) PAL is also used in a

few places, but is not as popular. It was derived from the NTSC system but by reversing the phase of the reference color burst on alternate lines (Phase Alternating Line) is able to correct for hue shifts caused by phase errors in the transmission path. For this reason the hue control is not needed on a PAL TV set. Bandwidth for the PAL-I system is typically 5.5 MHz luminance, and 1.3 MHz for each of the color difference signals, U and V. "PAL" is also commonly (though incorrectly) used to refer to any 625/50 video system.

PAL 60 _ This is a NTSC video signal that uses the PAL color subcarrier frequency (about 4.43 MHz) and PAL-type color modulation. It is a further adaptation of NTSC 4.43, modifying the color modulation in addition to changing the color subcarrier frequency. It was developed by JVC in the 1980s for use with their video disc players, hence the early name of "Disk-PAL". There is a little-used variation, also called PAL 60, which is a PAL video signal that uses the NTSC color subcarrier frequency (about 3.58 MHz), and PAL-type color modulation.

Palette _ A thumbnail of all available colors to a computer or devices. The palette allows the user to chose which colors are available for the computer to display. The more colors the larger the data and the more processing time required to display your images. If the system uses 24-bit color, then over 16.7 million colors are included in the palette.

Palletized Textures _ A form of texture compression. It's used to reduce the size of a texture when the texture does not have many unique colors. 4-bit palletized textures can have 16 different colors. 8-bit palletized textures can have 256 different colors.

PAL-M _ A version of the PAL standard, but using a 525 line 60-field structure. Used only in parts of South America (e.g. Brazil).

Palmtop _ A computer small enough to hold in one hand and operate with the other. Palmtops may have specialized keyboards or keypads for data entry applications or have small qwerty keyboards.

Palomino _ Originally, AMD's Palomino core was to have been a relatively minor update to its predecessor - the Thunderbird - that focused on reducing power consumption and associated heat dissipation. However, in the event its release was slipped by several months and the new core ended up representing a significantly greater advance than

had at first been envisaged, both in marketing and technological terms. Manufactured using AMD's 0.18-micron copper interconnect technology, the Palomino comprises 37.5 million transistors on a die of 128mm^2 - an increase of only 0.5 million/8mm^2 compared with its predecessor - and by using a greater number of these that have been optimized for specific portions of the core, AMD claims to have achieved a 20% decrease in power usage compared to an equivalently clocked Thunderbird core. Additionally, the new core has been improved in three major areas, AMD having coined the term "QuantiSpeed Architecture" to describe the enhanced core in general and the XP's ability to achieve a higher IPC than Intel's Pentium 4 in particular. The first concerns the Processor's Transition Lookaside Buffer (TLB). The TLB is best thought of as just another cache which - like the better known L1 and L2 caches - provides a mechanism that further enables the CPU to avoid inefficient access to main memory. Specifically, the TLB caches hold data used in the translation of virtual addresses into physical addresses and vice versa. The probability of a CPU finding the address it needs in its TLB - known as the processor's TLB hit-rate - is generally very high. This is just as well, because conversely, the penalty when a CPU fails to do so can be as much as three clock cycles to resolve a single address. Whilst the new core's L1 and L2 cache sizes and mappings remain unchanged, what *is* different is the Palomino's automatic data prefetch mechanism that works alongside its cache. This predicts what data the CPU is likely to need and fetches it from main memory into its cache in anticipation of its request. An evolution of previous designs that have been around for some time, the Palomino's includes a feature which allows software initiated data prefetch functions to take precedence over the core's own mechanism. Hitherto, the Athlon processor has supported only a partial implementation of Intel's SSE technology. The third major improvement over its predecessor sees the Palomino add a further 52 new SIMD instructions to those supported previously. AMD had dubbed the original 21 SIMD instructions implemented "3DNow!" and the 19 added subsequently "Enhanced 3DNow!". With Palomino's implementation of the full SSE instruction set AMD's associated terminology has been revised to subsequently "3DNow! Professional". A further innovation is the Palomino's OPGA (organic

PGA) packaging, which replaces the somewhat dated CPGA (ceramic PGA) arrangement used by earlier cores. The "Athlon 4" nomenclature, so prominent at the time of the processor's launch, has only been used in the context of the company's mobile processors, with "XP" - the letters standing for "extra performance" - being the preferred marketing terminology for the company's mainstream desktop processors. The XP family originally comprised four models - 1500+, 1600+, 1700+ and 1800+ - operating at clock speeds of 1.33GHz, 1.40GHz, 1.47GHz and 1.53GHz respectively. By the beginning of 2002 the range had been extended to the XP 2000+. In deference to AMD's model numbering strategy, suffice to say that this is likely to have equivalent performance to a 2GHz Pentium 4 processor!

PALplus _ PALplus is a TV standard which was developed on the basis of PAL and is compatible with PAL. The fundamental differences between PALplus and PAL are that PALplus operates with a aspect ratio of 16:9 and pre-filtering of the PALplus signal to ensure a better picture quality. In PALplus the 575 lines of the active picture content is composed of a central band signal which consists of 432 lines and a helper signal containing 143 lines. With a PALplus receiver the complete picture can be represented, i.e. the 575 active lines. On the other hand, a conventional 4:3 receiver represents the 432 lines of the central band in letterbox format, that is, with a black bar at the top and bottom edge of the picture.

Pan and Scan _ A technique for changing the field of view of a motion picture or down converted HDTV images so that only a portion of the wider image is shown on a narrower standard definition screen. The image is adjusted side to side to adjust framing for the narrower screen.

Panel _ Also known as a projection panel, LCD projection panel, or plate. The panel is the predecessor of today's projectors. It is slightly larger and heavier than a notebook computer and the LCD it uses to produce an image is very similar to that of the notebook computer. Because panels lack their own light source, they are designed to sit on top of a transmissive overhead projector (OHP). Because of its small size, low cost, and versatility, panels have been a popular solution for education applications where an OHP is frequently available in the classroom for other instructional purposes. A few products have been built that integrated the panel and the OHP. These were some of the earliest projectors.

Parallel _ One transmission path for each bit.

Parallel Cable _ A multi-conductor cable carrying simultaneous transmission of digital data bits. Analogous to the rows of a marching band passing a review point.

Parallel Data _ Transmission of data bits in groups along a collection of wires (called a bus). A typical parallel bus may accommodate transmission of one 8-, 16-, or 32-bit byte at a time.

Parallel Digital _ A digital video interface which uses twisted pair wiring and 25-pin D connectors to convey the bits of a digital video signal in parallel. There are various component and composite parallel digital video formats.

Parallel Port _ (a.k.a. IEEE1286) A computer interface capable of transferring more than one bit simultaneously. Almost all Windows Based personal computers come with at least one parallel port. On PCs, the parallel port uses a 25-pin connector (type DB-25) and is used to connect printers, scanners, computers and other devices that need relatively high bandwidth. It is often called a Centronics interface after the company that designed the original standard for parallel communication between a computer and printer. A newer type of parallel port, which supports the same connectors as the Centronics interface, is the EPP (Enhanced Parallel Port) or ECP (Extended Capabilities Port). Both of these parallel ports support bi-directional communication.

Parallel Processing _ Using several processors simultaneously with the aim of increasing speed over single processor performance. It often refers to array processor computer hardware that carries out multiple, often identical, mathematical computations at the same time. Generally array processors are designed with specific tasks in mind and so are not suitable for running complex operational software. Due to system administration and the fact that not all processors will complete their tasks at the same moment, causing waiting time, the increase in speed gained by sharing the task is generally not proportional to the number of channels available. Due to the very different structure of a parallel processing computer, software designed to run on a single processor system may well need very major changes to run on a parallel system.

Parameter _ a) A variable value that affects some aspect of performance. _ **b)** Characteristic elements of a sound that are usually programmable in a synthesizer or other MIDI device.

Parametric Equalizer _ An equalizer with separate controls for frequency, bandwidth and cut/boost.

Parasite _ Refers to software that is installed in your computer that you generally do not want and are not even aware of. There are many different types. Parasites can report your Web browsing habits to a marketing company over the Internet (spyware) or change your browser settings to point to a specific site. They can redirect searches to popular search engines to a site that sells a related product. They can cause you to dial up premium services.

Parent Object _ The dominate object in a hierarchical chain. Typically, you assign hierarchies to portions of a model in 3D modeling, making one part of the model the parent and the other the child. For instance, if you make a human model, and assign the torso as the parent object, the head, arms and legs of the model are the child objects. Similarly, in this example the upper arm would be the parent of the lower arm, which would be the parent of the hand.

Parity _ A method of verifying the accuracy of transmitted or recorded data. An extra bit appended to an array of data as an accuracy check during transmission. Parity may be even or odd. For odd parity, if the number of 1's in the array is even, a 1 is added in the parity bit to make the total odd. For even parity, if the number of 1's in the array is odd, a 1 is added in the parity bit to make the total even. The receiving computer checks the parity bit and indicates a data error if the number of 1s does not add up to the proper even or odd total.

Partial _ A sine wave component of a complex sound.

Partition _ A way to logically divide a hard drive so that an Operating System treats each partition as a separate hard drive. Each partition has a unique drive letter.

Passive Graphics _ A computer graphics operation that takes place automatically and without operator intervention.

Passive Matrix LCD _ The original LCDs, these are controlled by a single processing system, for the whole screen, unlike active and poly-si, which have discrete circuits for each "pixel." This results in a panel with terrible color dynamics and contrast (typically 15:1). They are also incredibly slow. On passive laptop computers, the cursor (or anything else) moving on the screen, goes invisible until you stop moving it (submarining). Only one or two projectors use any type of passive matrix display.

Patch _ A temporary or quick fix to a program. Too many patches in a program make it difficult to maintain. The term may also refer to changing the actual machine code when it is not convenient to recompile the source program. The term is also used to refer to a general-purpose fix that does not actually patch a piece of the program, but is an entirely new executable module that replaces the old one.

Patch Editor _ a category of MIDI software used to control the sound characteristics of a synthesizer from a computer.

Patches _ also variously known as programs, timbres, or voices. The name used for the sounds that can be generated by a MIDI device.

Path _ A vector based line described by Bézier curves.

Pattern _ An image that repeats itself.

Pattern Recognition _ Computer-based recognition of forms or shapes within an image.

Pay-TV _ A general term describing any TV channel for which you must pay extra. As well as normal subscription channels this term includes others where you have to "pay-per-view". For example on pay-per-view channels you have to pay individually to watch a particular film, or to watch one-off sports fixtures or other special events.

pbm _ *Portable bitmap files* - The portable bitmap format is a lowest common denominator monochrome file format. It was originally designed to make it reasonable to mail bitmaps between different types of machines using the typical stupid network mailers we have today. Now it serves as the common language of a large family of bitmap conversion filters.

PC _ A generic term used for *personal computers*. A stand-alone laptop or desktop computer running Windows (or DOS for earlier applications). PC hardware and operating systems are primarily governed by Intel and Microsoft respectively. The PC is the world's largest computer base.

PC Card _ A special card that plugs into your computer. It usually adds another function to it and allows your computer to "talk" (i.e. communicate) with other devices.

PC chipset _ A set of chips that provides the interfaces between all of the PC's subsystems. It provides the buses and electronics to allow the CPU, memory and input/output devices to interact. Most PC chipsets, which are housed on one to four chips, also include built-in ATA hard disk (IDE) support. The PC chipset, CPU, memory, clock, buses, keyboard circuit and BIOS make up the PC motherboard.

PCB _ *Printed Circuit Board* - A substrate on which a pre-determined interconnect pattern has been formed, used to assemble and connect together ICs and other electronic components into a subassembly

PCD _ Kodak's PhotoCDTM high-resolution file format for storage on CD-ROM containing up to 5 different resolutions present.

PCI bus _ A 32-bit bus for transferring data. A PCI bus can transfer 132 megabytes per second at a clock frequency of 33 Mhz. Also known as *Peripheral Component Interconnect*

PCI Express _ An advanced version of the PCI bus introduced in 2002. Rather than the shared, parallel bus structure of PCI, PCI Express provides a high-speed, switched architecture. Each PCI Express link is a serial communications channel made up of two differential wire pairs that provide 2.5 Gbits/sec in each direction. Up to 32 channels may be combined, creating a parallel interface of independently controlled serial links. The bandwidth of the switch backplane determines the total capacity of a PCI Express implementation, which can dwarf the original 33MHz PCI bus. PCI Express can easily accommodate chip-to-chip transfers as well as Gigabit and 10 Gigabit Ethernet. Similar in architecture to InfiniBand, PCI Express is designed for internal connections, whereas InfiniBand provides a true fabric architecture for extending the connection via external networks.

PCI Slot _ This is the name given to the slots inside your computer where such things as sound cards and modem are plugged in. Once inserted into these slots the computer will know they are there and set up the necessary driver files to make them work. This setup procedure is referred to as "Plug & Play".

PCM _ *Pulse Code Modulation* - A method of encoding audio information in a digital format. It is a serial data stream that is coded for transmission or recording. PCM samples analog audio information at a fixed sampling rate and measures the amplitude (volume) of the audio signal with a precision determined by the sampling size. Audio is encoded on CD's in the PCM format with a sampling frequency of 44.1 kHz and a 16-bit sampling size. A 16-bit sample size can contain 65,536 possible levels of sound volume which corresponds to a dynamic range of 96dB. A DVD-Audio can be encoded in PCM with a sampling frequency of up to 192 kHz and a 24-bit sample size. Standard uncompressed PCM (as used for audio CD's) is also referred to as linear PCM. An often encountered compressed equivalent is ADPCM, which is used for CD-I and CD-ROM XA disks.

PCMCIA _ *Personal Computer Memory Card International Association* - The standard for Credit Card Memory and Device Cards used in portable computers and laptops. Most laptops have one or two PC Card slots. Most commonly used for rapid data transfer from a Smart Media, a Compact Flash or a Memory Stick type memory card to the host PC. As well as providing Flash Memory PCMCIA Cards can provide extra hard storage space and Modem or Fax capability. Comes in two flavors: Type I/II which is a single slot height and Type III which requires a double-height card slot. Cards used in digital cameras offer removable storage and an easy way to transfer photos from the camera to a notebook or desktop PC. There are PCMCIA adapters for CompactFlash, SmartMedia, Secure Digital, MultiMediaCard and Memory Stick flash cards.

pcx _ Unique graphic file to Windows PC Paintbrush, it's been around for many years and become something of a stalwart amongst graphic design software manufacturers. Unfortunately it's fallen out of favor and is not often used today.

PDA _ The name - ***Personal Digital Assistant*** refers to any small electronic hand held personal organizer. A handheld computer that serves as an organizer for personal information. It generally includes at least a name and address database, to-do list and note taker. PDAs are pen based and use a stylus to tap selections on menus and to enter printed characters. The unit may also include a small on-screen keyboard which is tapped with the pen. Data are synchronized between the PDA and desktop computer via cable or wireless transmission. A PDA is like a palmtop computer except that the PDA typically uses a pen whereas the palmtop uses a small keyboard. Apple's MessagePad, more commonly known as the "Newton," was the first to popularize the concept.

PDD _ Adobe PhotoDeluxe native file format used to save files for the application.

PDF _ *Portable document format* - A type of file format developed by Adobe that is "portable" in that the same file can be opened and viewed on almost any computer platform (PC, Mac, Unix). It can also be printed on almost any printer (dot matrix, laser, inkjet, PostScript or non-PostScript). A PDF is a "document" file in that it includes text and graphics in one file that maintains the appearance of the original. The process uses any of several types of compression, which must be chosen at the time the PDF is created. Adobe Acrobat is the software package used with PDF files. PDF files are widely used on the internet and as e-mail attachments.

Peak _ The highest or lowest level of signal strength, as determined by the height of the signal's waveform.

Peaking _ A means of compensating for mid- and high-frequency RGB video bandwidth response in data monitors and projectors and for signal losses resulting from cable capacitance. The higher the frequency and the greater the cable length, the more peaking may be required.

Peak-to-peak _ Abbreviated "**p-p**". The difference in amplitude (voltage, for example) between the most positive and the most negative excursions (peaks) of a signal.

Pentium _ 1993-1996 First Pentium CPU models. The Pentium has L2 cache from 256KB to 1MB, uses a 50, 60 or 66MHz system bus and contains from 3.1 to 3.3 million transistors built on 0.6 to 0.35 process. Chips were housed in PGA packages. Speeds 60MHz-200MHz

Pentium 4 _ Latest Pentium architecture adds a 400MHz system bus and 256KB L2 Advanced Transfer Cache. It contains 42 million transistors, uses the 0.18 micron process and comes in 423-pin and 478-pin PGA packages. Intel's first chipset for the Pentium 4, the 850, supported only dual Rambus memory. Its subsequent 845 chipset supports DDR SDRAM. Speeds - 1.4-3.2 GHz

Pentium Family _ A family of 32-bit CPU chips from Intel. The term may refer to the chip or to a PC that uses it. Pentium chips and Pentium PCs are the most widely used in the world for general-purpose computing. The first Pentium chip was introduced in 1993 as the successor to the 486, thus the Pentium began as the fifth generation of the Intel x86 architecture. Numerous variations of the Pentium have been introduced with increased performance. Each new line executes more instructions in the same clock cycle as the previous, and clock speeds increase constantly. The Pentium uses a 64-bit internal bus compared to 32-bits on its 486 predecessor. Intel's next-generation Itanium chip departs from the Pentium architecture.

Pentium II _ 1997-1999 Added MMX multimedia instructions to Pentium Pro and introduced large Single Edge Connector Cartridge (SECC) for Slot 1. The Pentium II uses a 66 or 100MHz system bus. Desktop models have 7.5 million transistors, 512KB L2 cache and are housed in SECC packages. Mobile models have 27.4 million transistors, 256KB L2 cache and are housed in either BGA or Mobile Mini-Cartridge (MMC) packages. Speeds - 233MHz-450MHz.

Pentium II Xeon _ 1998-1999 Typically used in high-end and 2-way and 4-way servers, Xeon specs are like Pentium II with L2 cache from 512KB to 2MB and 100MHz system bus. Speeds - 400MHz-450MHz.

Pentium III _ 1999-2001 The Pentium III added 70 additional instructions to the Pentium II. The Pentium III uses a 100 or 133MHz system bus and either a 512KB L2 cache or a 256KB L2 Advanced Transfer Cache. Depending on the model, it contains from 9.5 to 28 million transistors, uses the 0.25 or 0.18 micron process and comes in SECC and SECC2 packages. Mobile units come in BGA and micro-PGA (µPGA) packages. Speeds - 500MHz-1.13GHz

Pentium III Xeon _ 1999-2001 Typically used in 2-way to 8-way servers, Xeon specs are like Pentium III, except both types of L2 cache can go up to 2MB. The Xeon uses the SECC2 and SC330 chip packages. Speeds - 500MHz-933MHz.

Pentium M _ A CPU from Intel for mobile computing, formerly code named "Banias." Introduced in 2003 with speeds up to 1.6GHz, the Pentium M supports multiple voltages so that power can be optimized based on user demand. The predecessors to the Pentium M were the Pentium III M, which phases out by 2004 and the Pentium 4 M, used in high-powered notebooks.

Pentium MMX _ 1997-1999 Added MMX multimedia instructions to Pentium CPU and increased transistors to 4.5 million. Desktop units used PGA package and 0.35 process while mobile units used TCP and 0.25 process. Speeds - 233MHz-300MHz.

Pentium Pro _ 1995-1997 Typically used in high-end desktops and servers, the Pentium Pro increased memory from 4GB to 64GB. The Pentium Pro has L2 cache from 512KB to 1MB, uses a 60 or 66MHz system bus, contains from 5.5 to 62 million transistors. It is made with 0.35 process and is housed in a dual cavity PGA package. When introduced, it was touted as being superior to the Pentium for 32-bit applications. Speeds - 150MHz-200MHz.

Perceptual Audio Coding _ A technique for further compressing digital sound by eliminating frequencies that cannot be perceived by the human ear. For example, when multiple sounds occur simultaneously, such as with several musical instruments, some cancel out others at any given moment depending on frequency and volume. Forms of ""perceptual coding" are used in popular audio coding formats such as Dolby Digital, DTS, MP3 and AAC.

Period _ The time required for one cycle in a periodic waveform. Period is the inverse of frequency.

Peripheral _ Any hardware device connected to a computer, such as a monitor, keyboard, printer, disk, tape, graphics tablet, scanner, joy stick, paddle and mouse.

Peripheral Bus _ Also known as an "input/output bus" or "I/O bus," it is a pathway that connects peripheral devices to the CPU. The ISA, PCI and USB busses are commonly used in PCs. EISA and VL-bus were used previously.

Peripheral Device _ Normally an external device that a CPU communicates with, such as a printer, mouse, disk drive or interface.

Perpendicular Recording _ A method of digital recording on a magnetic material in which the bits are in a vertical arrangement instead of a horizontal layout in order to take up less space. Perpendicular recording is one method expected to break the super para-magnetic limit.

Persistence _ In video, persistence is the "staying power" of a lighted phosphor, since a phosphor begins to dim after being excited by the electron beam. A long-persistence screen allows the phosphor to dim more slowly.

Perspective - The position of the camera relative to the player's character. First-person perspective denotes a view from the character's own eyes, while third-person perspective refers to a camera position somewhere outside the character, usually floating behind the character.

Perspective Correction _ A particular way to do texture mapping; it is extremely important for creating a realistic image. It takes into account the effect of the Z value in a scene while mapping texels onto the surface of polygons. As a 3D object moves away from the viewer, the length and height of the object become compressed, making it appear shorter. Without perspective correction, objects will appear to shift and "tear" in an unrealistic way. True perspective correction is that the rate of change per pixel of texture is proportional to the depth. Since it requires a division per pixel, perspective correction is very computing intensive.

Petabyte (PB) _ A measurement of data storage capacity on a computer. 1024 Terabytes.

P-frame _ *Predicted frame* - A frame created during the MPEG or MPEG-2 IBP compression process. A P-frame is created by using motion vectors to predict the differences between it and the closest previous I-frame or P-frame. This forward prediction allows for higher compression than with I-frames, but not as high as with Bframes. P-frames, like B-frames, contain only predictive data and therefore cannot be edited independently.

PGA _ a) *Professional Graphics Adapter* Early IBM analog graphics adapter found in the PC AT series. The PGA was capable of producing 256 colors with a resolution of 640 x 400. _ **b)** *Pin Grid Array* A square chip package with a high density of pins (200 pins can fit in 1.5" square), enabling it to support a large amount of I/O. PGAs are typically ceramic (CPGA), but plastic cases are also used (PPGA). The underside of a PGA package looks like a "bed of nails." In a staggered PGA (SPGA), the pins do not line up in perfect rows and columns.

Phantom Power _ Power supplied to a microphone using the shield of a balanced audio connection. Microphones using phantom power must be condenser-style, designed for use with phantom power systems. Damage can result to other types of audio components from the improper use of phantom power.

Phase _ The relative position of a wave to some reference point; the frequency coherence of a signal; the timing difference between two electrical waveforms expressed in degrees, where 360 degrees corresponds to a delay of exactly one cycle. If two signals are "out of phase", the trough of the first waveform corresponds with the peak of the second, resulting in cancellation.

Phone-home _ The ability of a server, PC or other device to directly notify a repair center when it is failing, beginning to fail or for routine maintenance.

Phong Shading _ Phong shading is a sophisticated smooth shading method, originated by Phong Bui-tuong. The Phong shading algorithm is best known for its ability to render precise, realistic specula highlights. During rendering, Phong shading achieves excellent realism by calculating the amount of light on the object at tiny points across the entire surface instead of at the vertices of the polygons. Each pixel representing the image is given its own color based on the lighting model applied at that point. Phong shading requires much more computation for the hardware than Gouraud shading.

Phosphor _ A luminescent substance, used to coat the inside of a television or computer display, that is illuminated by an electron gun in a pattern of graphical images as the display is scanned.

Photo CD _ A CD format based on the CD-ROM XA and Orange Book Hybrid Disc specifications, used to store photographic images for display and printing. Also, Kodak's professional service where they process your film and then scan the images using a very expensive drum scanner and output these images to a CD. You get several different sized resolution images of each of your film pictures, from small to very large.

Photo CDTM _ Eastman Kodak's digital image storage system for multiple color photographs on one CD disc. A CD ROM receiver is required for playback on a TV, and access software and CD driver are required for computer imaging.

Photo YCC _ A color encoding scheme developed by Kodak for its Image PAC file format

Photonic Crystal _ A nanostructured array of holes used as an optical semiconductor. Just as electronic bandgaps prevent electrons from passing through, photonic crystals create photonic bandgaps that confine light. This technology is expected to increase the efficiency in optical fibers and allow microscopic lasers to be built. It is also expected to be used in the construction of photonic circuits that can stand alone or be integrated into semiconductor circuits.

PhotoShop _ An image editing software package created and sold by Adobe Systems Inc. PhotoShop is the most commonly used image editing software used by professional photographers and graphic artists.

PhotoShop Plug-in _ A small program that allows a camera, scanner or printer to work directly with Adobe PhotoShop software.

Physical Format _ The physical format of a CD determines how data is recorded in each sector. The various physical formats are defined by the color book standards (such as Red Book, Yellow Book, and so on).

Physics _ In a gaming context, physics represent the rules implemented in a gameworld that govern how objects behave. For instance, if a character jumps, the arbitrary amount of gravity in the game will determine how high he can jump and how fast he will fall back down. Some recent games have provided very realistic physics modeling in their gameworlds; a character might throw a stone to knock a tin can off a table, and both objects will fall the same way they would in the real world. Sony is seeking to make this type of realism standard in PlayStation2 games, as both the system and software Sony is providing to developers make realistic physics easier for game creators to use.

PIC _ A standard file format for animation files.

Picosecond (ps) _ One trillionth of a second. Light or electrical pulses travel about 12 mils (0.012 inches) in one picosecond

PICT _ The PICT format was originally developed by Apple Computer in the mid-1980s. The PICT format supports RGB files with a single alpha channel, and indexed-color, grayscale, and Bitmap files without alpha channels. The PICT format is especially effective at compressing images with large areas of solid color. There are two types - PICT I and PICT II. PICT II is the current standard and supports color up to 32 bits of color-

PictureCD _ Kodak's amateur service of putting your camera images (1,534-by-1,024) onto a CD disc. One roll per PictureCD.

PID _ *Packet identifier* - The identifier for transport packets in MPEG-2 Transport Streams.

Pillarbox _ Describes a frame that the image fails to fill horizontally (a 4:3 image on a 16:9 screen), in the same way that a letterbox describes a frame that the image fails to fill vertically (a 16:9 image on a 4:3 screen)

PIM _ It's a *Personal Information Manager*, which is any kind of software that helps you organize your personal data. A Pim can manage your diary, your messages or your list of contacts.

Ping _ The amount of time it takes a packet of data to be sent from a gamers machine, to an online server he or she is playing on, and back. This time contributes to the player's lag. With console systems heading into the online realm, this will soon be an issue for video gamers as well as PC gamers.

Pink Noise _ A uniform noise level over a given bandwidth, usually in the video frequency range.

PIO _ *Programmed I/O* - In a hard drive with an ATA (Advanced Technology Attachment) interface, data transfers between the drive and host using programmed I/O (PIO). The host uses PIO to write to the Command Block Registers (CBRs) when transmitting control information, such as the location of a read command.

PIP _ *Picture in picture* - Displaying a small picture within a larger picture by scaling down one of the images to make it smaller. Each picture requires a video source (camera, VCR, channel selector). Consumer TV can use PIP for viewing two channels at the same time or for viewing taped video and a channel, etcetera. Videoconferencing uses PIP to display pictures from video sources at each participating site onto each screen at the same time. The large picture could be of the current speaker, while pictures from the other sites display across the bottom of the screen.

Pipelining _ This process is used by computer processors to speed up the processing of data. A processor begins executing the next command before the first command has been completed.

Pitch _ **a)** A continuous frequency over time. _ **b)** The center-to-center measurement of dots in printing (dots) or pixels in a CCD or CMOS sensors. _ **c)** The distance between two successive perforations on a film.

Pitch shifter _ Device for changing the pitch of an audio signal without changing its duration.

Pixel _ *Picture Element* - A pixel, which is short for picture element, is the smallest sample that makes up a scan line. For example, when the horizontal resolution is defined as 640 pixels, that means that there are 640 individual locations, or samples, that make up the visible portion of each horizontal scan line. In a pure analog system, the pixel is sized according to the picture resolution of the system. In the digital video system, the size of the pixel is determined by the digital sampling rate. Pixel can refer to an individual sample of R, G, B luminance or chrominance, or sometimes to a collection of such samples if they are co-sited and together produce one picture element. Pixels may be **square** or **rectangular**. Graphics programs generally create images with square pixels. NTSC and PAL video pixels, however, are generally rectangular, which means graphics displayed on a TV screen will be distorted (e.g., a circle will display as an ellipse) unless the pixel aspect ratio of the graphics is adjusted to suit the video. The total number of pixels limits the detail that can be seen on a television. A typical television set has less than half a million pixels. The pixel count for HDTV is nearly two million.

Pixel Clock _ The pixel clock is used to divide the horizontal line of video into samples. The pixel clock has to be stable (a very small amount of jitter) relative to the video or the image will not be stored correctly. The higher the frequency of the pixel clock, the more samples per line there are.

Pixel Cloning _ Replicating or copying a single pixel or group of pixels. In retouching, pixels are transferred from an adjacent area to pickup color or texture.

Pixel Drop Out _ This can be a real trouble-maker, since it can cause artifacts. In some instances, a pixel drop out looks like black spots on the screen, either stationary or moving around. Several things can cause pixel drop out, such as the **ADC** not digitizing the video correctly. Also, the timing between the ADC and the **frame buffer** might not be correct, causing the wrong number to be stored in memory. For that matter, the timing anywhere in the video stream might cause a pixel drop out.

Pixel Loss _ A video problem in which picture information is missing, giving the appearance of specks in the image.

Pixel Resolution _ In computer graphics and video images the pixel resolution is the number of pixels in the display. For example, a picture with 1,024x768 pixels is much sharper, or has higher resolution, than a picture with 640x480 pixels. The total number of pixels is the product of these two numbers.

Pixelization _ The step-like appearance of a curved or angled line in digital imaging. The smaller the pixels, and the greater their number, the less apparent the "pixelization" of the image. Also known as the "jaggies."

Pixels Per Inch _ Pixels per inch (PPI) is a measure of the sharpness (that is, the density of illuminated points) on a television display screen.

PKZIP and PKUNZIP _ These two utilities are used for compressing or uncompressing files. Files that have been "zipped" or "unzipped" will have a .zip filename extension.

Plain Vanilla _ Refers to the bare minimum of functions that are known to be available in an application or system.

Plane _ In matrix switchers, a plane refers to all of the inputs and outputs of one signal. For example, the "red plane" would include all of the inputs and outputs for red signals, the "blue plane" would include all of the blue signals, and so forth.

Plasma Display _ Also called "gas discharge display," a flat-screen technology that contains an inert ionized gas sandwiched between x- and y-axis panels. A pixel is selected by charging one x- and one y-wire, causing the gas in that vicinity to glow. Plasma displays were initially monochrome, typically orange, but color displays have become increasingly popular with models 40 inches diagonal and greater being used for computer displays, high-end home theater and digital TV.

Platform (distribution) _ This is a word used to describe the distribution systems (platforms) for receiving digital TV or radio signals. They are - a) **terrestrial** - through a ground-based transmitter to your aerial e.g. Freeview; _ b) **satellite** - via satellite to a dish aerial e.g. Sky digital; _ c) **cable** - through the ground and cabled to your house or flat e.g. NTL, Telewest and others _ d) **DAB** - digital audio broadcasting from land based transmitters to your radio set

Platform _ Often used to define the operating system your computer runs on (such as Windows, Macintosh, or Linux), but platform can also refer to your computer hardware (such as Macintosh, SG or PC).

Platformer _ A close relative of the action game, the platformer's roots are in early systems like the NES. A 2D platformer is generally viewed from the side of the action, and the game scrolls from left to right. The player's character navigates a course of pits and platforms (thus the name), collecting items, fighting enemies, and attempting to reach the level's goal. With the emergence of 3D as being commonplace, however, the platformer's definition is growing to include games in which you do have more freedom of movement.

Platter _ An actual metal (or other rigid material) disk that is mounted inside a fixed-disk drive. Many drives consist of multiple platters mounted on the spindle to provide more data storage surfaces. Each platter may use one or both surfaces to store data.

Player _ In a multimedia *architecture*, the client software application, typically a *plug-in*, that enables playback of the media.

Player Window _ The window in any video streaming player (such as Windows Media Player, QuickTime, or Real Player) where you can watch streaming media content.

Playlist _ A selection of songs that are grouped together, often sharing a particular theme or genre.

PlayStation _ Sony's 32 bit PlayStation (or "PSX") console was released in 1995 and is the current market leader with well over 6 million unit sales and world-wide sales of around 90 million. The machine has now been superseded by PlayStation 2.

PlayStation 2 _ Sony's 128 bit PlayStation 2 (or "PS2") console was launched in Japan in March 2000 and sold just under 1m units in its first two days. The console has a world-wide installed base of around 32m units.

PLD _ *Programmable Logic Device* - An umbrella term for a variety of chips that are programmable at the customer's site (in this case, the customer is the circuit developer, not the end user). There are three physical structures. The first is the permanent fuse type which blows apart lines or fuses them together by electrically melting an aluminum trace or insulator. This was the first type of PLD, known as "programmable array logic" or PAL. The second is reprogrammable and uses EEPROM or flash memory. It causes a transistor to open or close depending on the contents of its associated memory cell. The third type is RAM based, which makes it dynamic and volatile. Its contents are loaded each time it starts up. This control memory is not a self-contained memory bank like one that is used to input data. It is a separate masking layer in the chip, and each programmable point is connected to its counterpart bit in this layer. CPLDs (Complex PLDs) and FPGAs (Field Programmable Gate Arrays) are common types of PLD chips. CPLDs are mostly EEPROM and flash based and are reprogrammable. FPGAs are the most widely used and come in permanent, reprogrammable and RAM based varieties. Unlike gate arrays, which require the final masking fabrication process, PLDs are easily programmable in the field. PLDs are always used for logical functions, but programmable storage chips such as PROMs and EPROMs might also be considered PLDs if they contain program code rather than just data.

Plot _ An element all too often missing from video games, the plot ties events together into a coherent story. Games that manage to convey a well-designed plot approach movielike status, such as *Final Fantasy VIII, Metal Gear Solid,* or *Resident Evil 2.*

Plotter _ A term applied to a peripheral unit that through computer control writes data on film. Also an electrostatic device that dispenses color toners through one or more passes.

Plug and Hope _ Refers to the frustration of installing additional peripheral devices on a PC.

Plug and Play _ An automated installation process used to connect peripherals to a computer working in Windows. You should be able to plug in a device and play with it, without worrying about drivers, setting DIP switches, jumpers, and other configuration elements. When new devices are plugged into the computer the computer recognizes the device and prompts the user to choose setup options and finish installation. It doesn't work 100% error-free.

Plug and Pray _ What some people call Plug and Play on the PC. Plug and Play goes a long way to solving the frustration of adding peripherals to a PC, but it is not infallible.

PLUGE _ *Picture Line Up Generation Equipment* - This is a name of a test pattern that assists in properly setting picture black level. PLUGE can be part of many test patterns. The phrase and origination of the test signal are both credited to the BBC.

Plug-in _ A software module that extends the features of and can be used within a software application. A plug-in is usually a DLL file that you install into some other program and thus you increase the functionality of that program. A plug-in cannot be used as a stand-alone program. It can change, expand or update the scope of performance of (among other) editing or compositing software to expand the effects capabilities of a system. It can also extend the capabilities of your Web browser by adding such things as audio, video or animation powers which can turn your computer into a TV or allow you to listen to live radio programs. Not all plug-ins work with all products, specific interfaces are required for different types of software. Plug-Ins are also software version dependent.

Plug-inless _ Refers to some unique feature on a Web site that does not require a plug-in to be downloaded, installed and associated with the browser in order to use it. Users prefer plug-inless solutions for many reasons. First, everyone is leery of viruses coming from the Web, and second, if you work on several machines, or if you buy a new one, all your browser plug-ins have to be downloaded again and reinstalled.

PMA _ *Program Memory Area* - On a recordable CD, an area that "temporarily" contains the Table of Contents information when tracks are written in a session that is not yet closed. When the session is closed, this same information is written in the session lead-in.

**PMOS _ *P-Channel MOS* **- A device in which carriers of electrical current and the path (channel) in which they flow are positively charged

PMT _ *Photo multiplier tube* - A light sensitive device used in some scanners and film recorders, and provide a good single-to-noise ratio, and a wider dynamic range.

PNG _ *Portable Network Graphics* - Developed as a patent-free alternative to GIF, this format is used for lossless compression for the purposes of displaying images on the World Wide Web. Adopted by the WWW consortium as a replacement for GIF, some older versions of Web browsers may not support PNG images. It is a compressed file format similar to JPG.

Poachware _ Similar to spyware, except that its purpose is to copy much more sensitive data such as usernames and passwords. Smart tags have also been called poachware by the owners of competitive Web sites.

Pocket Computer _ handheld, calculator-sized computer that runs on batteries. It can be plugged into a desktop or laptop computer for data transfer.

Pocket PC _ An operating environment for handheld computers from Microsoft, based on the Windows CE operating system. In 2000, Microsoft introduced the Pocket PC platform which includes a combination of Windows CE Version 3.0, an enhanced user interface, Pocket Office applications (Internet Explorer, Word and Excel), handwriting recognition, an e-book reader, wireless Internet and longer battery life. The Pocket PC was designed to compete more directly with the popular Palm devices.

Point _ A standard measurement unit for type sizes. One point equals approximately 1/72 of an inch.

Pointing Device _ An input device used to move the pointer (cursor) on screen. The major pointing device is the mouse for the desktop computer and the touchpad for the laptop, although many road warriors bring along a mouse. Pointing sticks are available on some laptops, and a small number of users prefer trackballs over the mouse.

Point-to-multipoint _ An arrangement, either permanent or temporary, in which the same data flows or is transferred from a single origin to multiple destinations; the arrival of the data at all the destinations is expected to occur at the same time or nominally the same time.

Point-to-point _ A videoconference between two locations, like a telephone call.

Polarity _ The positive and negative orientation of a signal. Polarity usually refers to the direction or to a level with respect to a reference. For example, positive sync polarity means that sync occurs when the signal is going in the positive direction.

Poly _ Short for Polystyrene foam - sheets are used for bouncing light.

Polygon _ A near-planar surface bounded by edges specified by vertices. A multisided geometric figure, such as a triangle, square, or hexagon, which is the building block of most 3D video games. By far the most common polygon found in 3D games is the triangle, because a three-sided shape is much easier for a game system to calculate than more complex shapes. You will sometimes see game characters referred to as being polygonal or full of polygons.

Polygon Map _ Defines the borders of homogeneous features as well as the characteristics associated with those features which identify special land related information (e.g., a soils map describes the boundary characteristics of soil types from which the following types of information can be obtained: areas which have unstable land for construction; areas that may be within a floodplain; wetland areas; areas with high potential productivity for farming, etc.) Polygon mapping is the cartographic display of regularly or irregularly shaped polygons and their attributes. Typically, this capability includes shading, symbology and numeric labeling, as well as other map cosmetic functions for generating alphanumeric labeling of polygons.

Polyphonic _ The ability to play back some number of musical notes simultaneously. For example, 16-voice polyphony means a total of 16 notes, or waveforms, can be played concurrently.

Poly-Si (silicon) LCD _ A popular LCD technology for the top of the line LCD projectors. Monochrome Poly-Si LCDs are typically placed in each of the three color light paths inside a projector, one each for Red, Green, and Blue. This results in increased color saturation, with contrast ratios above 200:1. Poly-Si technology is also a bit faster than the Active Matrix TFT, for smooth video and multimedia.

POP3 Account _ *Post Office Protocol Account* - This is the system that provides a store and forwarding service for moving E-mail on demand from an intermediate server to a users single destination computer.

Pop-up _ A real-time 3D world takes memory store, and memory is a finite commodity in a video game system, thus the gameworld must have visible boundaries. Often, at the visible horizon in a game, players will notice that the world ceases to exist. As they move forward, more of the polygons in the world will "pop" into existence, and as they move backward, the polygons will disappear again. This effect is especially common in racing games. Many designers use creative level arrangement or a fogging effect to hide pop-up.

Port _ A connection for an input or output device. Typical ports found on a computer include serial, parallel, SCSI, disk drive, video, and keyboard ports.

Port replicator _ A device used to connect multiple peripherals to a laptop. The desktop devices are permanently plugged into the port replicator, which connects to the laptop via a large plug and socket that duplicates all the cable lines for the monitor, printer, keyboard, mouse, etc. It serves a similar purpose as a docking station, but does not contain any slots for expansion or speakers or peripherals.

Portable Computer _ A computer that can be transported. Portable computing started in 1981, when Adam Osborne introduced his CP/M-based business computer called the Osborne I. It came bundled with a modified version of the WordStar word processor specialized for the machine's pint-sized screen. The Osborne I was soon followed by Kaypro, Hyperion, Otrona and many others. One year after the Osborne, Compaq introduced the first MS-DOS portable.

Portable Hard Drive _ A disk drive that is plugged into an external port on a computer such as USB or FireWire. Typically used for backup, but also as secondary storage, such units rival internal drives in capacity. For laptops, the PC Card slot may be used to connect a cable to a full-size drive, or the hard disk may be contained entirely inside the PC Card.

Portal _ A Web site that provides both access to a wide variety of information and services (within itself) plus links to other Web sites. Portals are now using WAP technology to send information to mobile phones.

Portamento _ A gliding effect that allows a sound to change pitch at a gradual rate, rather than abruptly.

Portapak _ A portable, cheap and simple videotape recorder, usually accompanied with a separate video camera. The first was legendary Sony "Video Rover" - ½ " open reel recorder with a b/w Vidicon tube camera launched back in 1965!

Porting _ Converting software to run on another platform.

Post Processing _ Computer functions which cannot be accomplished in real time and immediately written to the disk require data processing. This time can vary according to the function and power of the system.

Postcardware _ is really freeware, but the writer would like to receive a postcard from where you live, just saying "Hi" and/or with feedback on the program.

Post-fade _ Aux signal taken from after the channel fader so that the aux send level follows any channel fader changes. Normally used for feeding effects devices.

Postproduction _ The work processes used by the motion picture and video industry can be divided into several phases. Postproduction describes the production phase of postediting the recorded material. It therefore comprises work steps such as cutting, effect editing, color correction, post-addition of sound to the film and graphical editing.

Postscript _ A page description language used to render text and pictures generated by computer programs. PostScript is a trade name owned by Adobe and widely licensed to manufacturers of printers to accurately display text and image on the printed page. Postscript is capable of rendering both bitmap images (scans) as well as vector illustrations.

PowerPC _ A family of RISC-based CPU chips designed by Apple, IBM and Motorola, introduced in 1993. Both IBM and Motorola offer the chips for sale, but IBM owns the architecture. The PowerPC is designed to span a range of computing devices from handheld machines to supercomputers. To

date, PowerPC chips have been used as the CPUs in Apple's PowerMacs, IBM's RS/6000 and AS/400 models as well as in embedded systems. IBM originally offered the PowerPC as a stand-alone AIX or Windows NT machine, but since dropped the models. The PowerPC is a refined version of IBM's RS//6000 single-chip CPU. It is a 32-bit multitasking microprocessor that has an internal 64-bit data path to memory similar to the Pentium. The first PowerPC chip was the 601 (MPC601), which was introduced with clock speeds of 50 and 66MHz. Subsequent models include the 602, 603, 603e, 604 and 604e. The 602 is designed for consumer products, while the 603s are geared for notebooks. The 604 and 604e provide higher speeds, mostly due to increased amounts of built-in cache and higher clock speeds. In 1997, the PowerPC 750 was introduced, providing a significant increase in performance. Also known as the G3 series, the first chips arrived with clock speeds of 233MHz and 266MHz. In 1999, the G4 chip came out starting at 350MHz. The G4 includes the Velocity Engine vector processor that provides a sustained one billion floating point operations per second. The 64-bit G5 speeds up to 2GHz and can address 8GB main memory.

Powerslide _ A technique in racing video games that lets the player swing the rear end of his car outward in a turn to diminish the loss of speed. A powerslide is accomplished by skillfully manipulating the gas and brake simultaneously.

Power-up _ An item in a game that grants the player temporary powers. Power-ups can enhance a character's weaponry, strength, speed, life, or a variety of other attributes but is usually removed either after a set amount of time or when the character dies.

PPI _ *Pixels Per Inch* _ **a)** a term that describes geometric resolution for display purposes**.** _ **b)** a measurement to describe the size of a printed image. _ **c)** a measurement for the density of scanned information

PPM _ **a)** *Parts-per-million* - refers to the accuracy of the electronic crystal inside each timecode capable device on set. _ **b)** *Peak Program Meter*; a meter designed to register signal peaks rather than the average level.

PPP _ *Point to Point Protocol* - is a kind of Internet connection that allows a computer to use Internet protocols to become a part of the Internet. It requires you to have a modem, a telephone line and an account with an ISP.

PQ coding _ Process for adding pause, cue and other subcode information to a digital master tape in preparation for CD manufacture.

P-rating _ Dating from the time of the PC's introduction in the early 1980s, users have been become accustomed to viewing higher performance as being synonymous with higher clock frequency. Until recently this made sense, since PCs from different manufacturers were based on the same internal architecture and therefore performed nearly an identical amount of work per clock cycle. Things changed with the advent of the Intel Pentium 4 and AMD Athlon processors in the late 1990s when the design architectures of the respective companies fundamentally diverged. The consequence was that rival processors operating at identical frequencies may offer dramatically different levels of performance. The reason for this is because the different architectures are capable of performing different amounts of work per clock cycle. So, a combination of clock frequency and IPC gives a far truer measure of processor performance, and it is this fact that lies behind AMD's rating and model numbering system. The company hopes that this will need serve only as an interim solution and is playing a leading role in efforts towards the establishment of a independent institution whose role it will be to create a performance measure that is more equitable than the current clock frequency based scheme and that will be universally adopted in future years.

Preamplifier _ A device that takes a source signal, such as from a turntable, tape deck or CD player, and passes this signal on to a power-amplifier. The preamplifier may have a number of controls such as source selector switches, balance, volume and possibly tone controls. Often shortened to "preamp".

Pre-emphasis _ A system for applying high frequency boost to a sound before processing so as to reduce the effect of noise. A corresponding de-emphasis process is required on playback so as to restore the original signal, and to attenuate any high frequency noise contributed by the recording process.

Preemptive Multitasking _ A multitasking method that shares processing time with all running programs. Preemptive multitasking creates a time-shared environment in which running programs get a recurring slice of time from the CPU. Depending on the operating system, the time slice may be the same for all programs or it may be adjustable to meet the

current mix of programs and users. For example, background programs can be given more CPU time no matter how heavy the foreground load and vice versa. Preemptive multitasking is vital in a mainframe, but is also useful in a desktop operating system. For example, it ensures that data will not be lost if a transmission is taking place in the background. The OS is able to grab the machine cycles that the modem or network program needs to continue processing the incoming data stream.

Pre-fade _ Aux signal taken from before the channel fader so that the channel fader has no effect on the aux send level. Normally used for creating foldback or cue mixes.

Pre-fetch _ Instructions that are loaded into a queue when the processor's external Bus is otherwise idle.

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

Premium Channels _ A general term usually used to describe more expensive television channels which offer you first run films or sports coverage where the programs have a "premium" over normal subscription channels. It can also be used to refer to pay-per-view channels.

Pre-processing _ Sometimes called *optimizing*, preprocessing removes non-essential information from your video and audio—information that is difficult to encode and/or does not substantively add to the quality of the streamed media. So pre-processing prior to encoding reduces the burden on the compressor, potentially saving time and CPU capacity.

Pre-production _ The planning phase of a film or video project - usually completed prior to commencing production.

Preread _ The preread function allows a video recorder to play a video signal and to record this video signal at precisely the same tape point at which it was played, in the same work step. This function makes it possible to achieve effects such as dissolves with a lin-

ear two machine editing workstation. Normally three or more machines are required to produce such effects.

Prerendered _ Prerendered graphics are calculated for game scenes that are too complex for the game system to handle in real time. The scenes are constructed on far more powerful computers and then are saved in a format the game system can use. Although they may look better than the best graphics the system is capable of producing on the fly, the looks are at the expense of freedom. Final Fantasy VIII's town and dungeon backgrounds are prerendered; they look nice but can only be viewed as the designers rendered them.

Presentation Device _ A general term used to define a video projector or data monitor.

Presets _ typically, the sounds permanently stored by the manufacturer in a sound generating device.

Pressure Sensitive Pen _ An electronic pen to be used with the digitizing tablet.

Pre-visualization _ A method of communicating a project concept by creating storyboards and/or rough animations or edits.

Primary Colors _ Any set of colors from which other colors can be derived. In video, the primary colors are red, green and blue. Equal amounts of red, green and blue make white; none makes black.

Primary Partition _ The partition where the Operating System files are stored. To start your operating system from a hard drive, it must have a primary partition. You must also make the primary partition active.

Primary Source Clip _ A source clip that has media attached to it. The original source clip from which secondary source clips and reference clips are created.

Primitive _ **a)** In computer graphics, a graphics element that is used as a building block for creating images, such as a point, line, arc, cone or sphere. _ **b)** In programming, a fundamental instruction, statement or operation.

Print Through _ The undesirable process that causes some magnetic information from a recorded analog tape to become imprinted onto an adjacent layer. This can produce low level pre or post echoes.

Print to Tape _ Outputting a digital video file for recording on a videotape.

Print to Video _ A feature of some on NL editing software that enables you to play a clip or the Timeline centered on a monitor. If the clip or Timeline is smaller than the full screen, it will play alone or on a black background. Print to Video is useful for previewing the program in the Timeline, for viewing source clips or individual files, or for video playback because it allows you to play a quarter screen video at full screen size.

Printed Circuit Board _ A flat board that holds chips and other electronic components. The board is made of layers (typically 2 to 10) that interconnects components via copper pathways. The main printed circuit board in a system is called a "system board" or "motherboard," while smaller ones that plug into the slots in the main board are called "boards" or "cards." The printed circuit board of the 1960s connected discrete components together. The circuit board of the 1990s interconnects chips, each containing hundreds of thousands or millions of elementary components. The "printed" circuit is really an etched circuit. A copper foil is placed over the fiberglass or plastic base of each layer and covered with a photoresist. Light is beamed through a negative image of the circuit paths onto the photoresist, hardening the areas that will remain after etching. When passed through an acid bath, the unhardened areas are washed away. The finished layers are then glued together.

Problem Domain _ is referred to as applications software. For example, word processing software is designed for a very specific collection of tasks, as is spreadsheet software, and so on. Such software is in contrast to systems software which is designed to perform a variety of general tasks for its user.

Proc amp _ *Processing amplifier* An electronic device that stabilizes or rebuilds signals.

Process _ The precise ingredients and recipe by which the integrated circuits are constructed for a given technology

Process Technology _ The "recipe" used to convert blank silicon wafers into finished wafers containing anywhere from dozens to thousands of chips. These chips are tested and assembled into plastic or ceramic packages before final use

Processing _ The number crunching computer function by which interactive instructions from the workstation are carried out.

Profile _ In MPEG-2, a profile specifies syntax and processes such as picture types, scalability, and extensions.

Program _ **a)** A set of instructions designed to make a device or a system perform a specific function or set of functions. . A program is called "software" and programs that users work with, such as word processors and spreadsheets, are called "applications" or "application programs." Therefore, the terms software, application and program are synonymous: they tell the computer what to do in precise detail. Although you may think you're telling your computer what to do, what is actually happening is that the program is allowing you to perform only those tasks it has been written to let you do. _ **b)** A sequence of reference clips arranged in a meaningful order. The final result of production with a video program.

Program Change Message _ a two byte MIDI message used to request that a synthesizer change the currently loaded program.

Program Delivery Control _ Information sent during the vertical blanking interval using teletext to control VCRs in Europe.

Program Stream _ In contrast to the elementary stream, the Program Streams consist of only one file in which audio and video are linked to each other (multiplexed). This enables simultaneous playback of sound and image. Program Streams are mainly used for computerized playback of high-quality videos (archiving, kiosk systems, etc.)

Programmability _ The capability within hardware and software to change; to accept a new set of instructions that alter its behavior. Programmability generally refers to program logic (business rules), but it also refers to designing the user interface which includes the choices of menus, buttons and dialogs.

Programming _ Creating a computer program. The steps are: 1. Developing the program logic to solve the particular problem. 2. Writing the program logic in a specific programming language (coding the program). 3. Assembling or compiling the program to turn it into machine language. 4. Testing and debugging the program. 5. Preparing the necessary documentation.

Programming Language _ A language used to write instructions for the computer. It lets the programmer express data processing in a symbolic manner without regard to machine-specific details. The statements that are written by the programmer are called "source language," and they are translated into the computer's "machine language" by programs called "assemblers," "compilers" and "interpreters." Like human languages, each programming language has its own grammar and syntax. There are many dialects of the same language, and each dialect requires its own translating system. Programming languages fall into two categories: low-level assembly languages and high-level languages. Assembly languages are available for each CPU family, and each assembly instruction is translated into one machine instruction by the assembler program. With high-level languages, a programming statement may be translated into one or several machine instructions by the compiler.

Progressive Download _ Also known as *pseudostreaming,* "progressive download" allows end-users to experience media accessed via a network such as the Internet, while the media file is still in the process of downloading; as opposed to *downloadable media,* which cannot be played back until the entire file is received. Unlike *true streaming,* progressive download leaves a copy of the media file on the client. Progressive download is also called *HTTP streaming* because Web server software using standard protocols (HTTP servers) can deliver progressive download files, unlike true streaming, which takes advantage of the special protocols used by *media server* software to adjust transmission to match the actual available bandwidth.

Progressive Scan _ Method of scanning lines down a screen where all the lines of a picture are displayed in one vertical scan. There are no fields or half pictures as with interlace scans. It is commonly used with computer displays and is now starting to be used for some DTV formats, e.g. - 1080/24p. The "p" denotes progressive. A high picture rate is required to give good movement portrayal, such as for fast action and camera pans, and to avoid a flickery display. For television applications this implies a high bandwidth or data rate and high scanning rates on CRT displays. The vertical definition is equal to around 70% of the number of lines (Kell

Factor) and does not show the dither of detail associated with interlaced scans.

Project _ File with all information pertaining to a job, including settings and source material.

Projection _ a) The process of reducing three dimensions to two dimensions for display is called Projection. _ **b)** It is the mapping of the visible part of a three dimensional object onto a two dimension screen.

PROM _ *Programmable read only memory* An electronic memory whose contents are not lost when power is removed, but that can be reprogrammed using a special PROM programmer ("burner").

Proprietary _ The opposite of open-architecture, ergo, a program or computer platform controlled legally by its owner.

Prosumer_ a term coined in the video production industry to denote equipment that may be classified as both "professional" and "consumer" - hence, prosumer.

Protocol _ A set of agreed-upon standards that define the format, order, timing, "handshaking" and error checking method for data transfer between two pieces of equipment.

Proximity Recording _ A recording technology that increases recording density by allowing the read/write head to come in close proximity to the disk surface.

Proxy _ A sampling of an image or page.

Proxy Server _ A computer that is running a program that acts as a gateway (i.e. a link) between your computer and the Internet.

psd _ This is the native PhotoShop file format and it allows for multiple layers or transparency effects to be added to an image. Several other graphics programs such as PaintShop Pro can read PhotoShop .psd files.

Pseudo Color _ Pseudo color is a term used to describe a technique that applies color, or shows color, where it does not really exist. We are all familiar with the satellite photos that show temperature differences across a continent or the multicolored cloud motion sequences on the nightly weather report. These are real-world examples of pseudo color. The color does not really exist. A computer uses a lookup table memory to add the color so information, such as temperature or cloud height, is viewable.

PsF Imaging _ *Progressive-Segmented Frame Imaging* - All lines (whole frame) are captured at the same instant. Each frame represents a single moment in time. After the frame is captured, it is then separated (Segmented) into two halves. One half is the odd lines and the other is the even lines. (Now this may sound like interlace, but each frame represents only one moment in time, not two). Though transmitted similarly as an interlaced signal, if treated as a progressive signal, does not cause the same harmful artifacts that interlace scanning causes. Often image can be processed with much of the same transmission hardware that was designed for interlace. Processing hardware can also be designed to handle both Interlace and PsF (i.e. Switchable).

PSIP _ *Program and system information protocol* - An ATSC DTV specification that enables a DTV receiver to identify the content providers program information and create on screen electronic program guides .

PSX/PSOne _ The industry abbreviation for the original PlayStation and the reduced form factor PlayStation released in 2001.

Psycho-acoustic Model _ A set of algorithms for analyzing sounds developed by Dr. Amar Bose. The psycho-acoustic model is used by perceptual audio coding methods to analyze audio content to reduce the complexity of the frequencies in order to further compress the digital data.

Public Access Provider _ Any organization that provides Internet access for individuals or other organization's - for a fee!

Public Domain Software _ Software in which ownership has been relinquished to the public at large.

Pull-down Menu _ These are the vertical lists that appear when you click on a menu heading. More often referred to as drop-down menu's because 90% of the menu's available in Windows - drop down!

Pulse Wave _ Similar to a square wave but non-symmetrical. Pulse waves sound brighter and thinner than square waves, making them useful in the synthesis of reed instruments. The timbre changes according to the mark/space ratio of the waveform.

Pulse Width Modulation _ A means of modulating the duty cycle (mark/space ratio) of a pulse wave. This changes the timbre of the basic tone; LFO modulation of pulse width can be used to produce a pseudo-chorus effect.

Punch-in _ The action of placing an already recorded track into record at the correct time during playback, so that the existing material may be extended or replaced.

Punch-out _ The action of switching a tape machine (or other recording device) out of record after executing a punch-in. With most multitrack machines, both punching in and punching out can be accomplished without stopping the tape.

Push-pull _ Most common type of amplification that amplifies the negative and positive sides of the waveform separately. Allows for much higher power output than single-ended.

Puzzle Games _ Beginning with Tetris, undoubtedly the most prolific video game in history, the puzzle genre spread like wildfire to every imaginable platform. Many puzzle games attempt to vary the Tetris formula, dropping pieces from the top of the screen toward some objective at the bottom. Some venture further from this formula, but all are easy to pick up and play for gamers of all ages and skill levels. Tetris, of course, Magical Drop, and Dreamcast's Chu-Chu Rocket are a few well- (or soon-to-be-well-) known puzzle games.

PVR _ *Personal Video Recorder* - Also known as a "*digital video recorder* (DVR)" or "hard disk recorder," a PVR is a consumer device that digitizes broadcast TV onto a hard disk and plays it back immediately, allowing the viewer to pause at any time and return later. Using hardware-based MPEG-2 compression like DVD movies, it also records programs for later viewing just like a VCR. Using a phone line, the PVR can call a service provider and download the channel guide updates as well as software updates for the unit itself. The PVR can also be set to periodically record favorite shows whenever they are broadcast.

PZR filter _ A filter that enables the rotation of clip frames around any of three axes, the positioning of a frame in any of three dimensions and the control of the point of view through perspective adjustments.

Q

Q (bandwidth) _ The bandwidth of an equalizer band. For high values the bandwidth is narrow. For low values, it is wide.

Q (filter) _ A measure of the resonant properties of a filter. The higher the Q, the more resonant the filter and the narrower the range of frequencies that are allowed to pass.

Q subcode _ A section of the subcode of an audio CD that defines timing and tracking information.

QAM - *Quadrature Amplitude Modulation* This digital frequency modulation technique is primarily used for sending data downstream over a coaxial cable network. 64QAM is efficient, supporting up to 28-Mbps peak transfer rates over a single 6-MHz channel. By comparison, 8-VSB will only support about 19.5-Mbps in terrestrial broadcast applications. QAM's susceptibility to interfering signals makes it ill suited to noisy transmissions.

QCIF _ *Quarter Common Interface Format* This video format was developed to allow the implementation of cheaper video phones. The QCIF format has a resolution of 176 x 144 active pixels and a refresh rate of 29.97 frames per second.

QPSK _ *Quadrature Phase Shift Keying -* It is a digital frequency modulation technique used for sending data over coaxial cable networks. Since it's both easy to implement and fairly resistant to noise, QPSK is used primarily for sending data from the cable subscriber upstream to the Internet.

QSIF _ *Quarter Standard Interface Format* The computer industry, which uses square pixels, has defined QSIF to be 160 x 120 active pixels, with a refresh rate of whatever the computer is capable of supporting.

Quad Standard _ A term used for video products that are compatible with the following four standards: NTSC 3.58, NTSC 4.43, SECAM and PAL.

Quadrature Amplitude Modulation _ A method of encoding digital data onto a carrier for RF transmission. QAM is typically used for cable transmission of digital SDTV and HDTV signals.

Quantization _ **a)** In analog to digital conversion, the process of converting a continuous analog signal into a set of discrete levels (digitizing). Video signals are frequently quantized with 8 or 10 bits, while values of 12 or 16 bits have been established in professional audio systems. The larger the range of numbers, the finer the increments can be measured, and the more the digital sample represents the analog signal. _ **b)** The division of a range of values into a single number, code or classification. For example, class A is 0 to 999, class B is 1000 to 9999 and class C is 10000 and above.

Quantizing Error _ Inaccuracies in the digital representation of an analog signal. These errors occur because of limitations in the resolution of the digitizing process.

Quantizing Noise _ The noise (deviation of a signal from its original or correct value) that results from the quantization process. In serial digital video, it is a granular type of noise that occurs only in the presence of a signal.

Quantum Computing _ A future technology for designing computers based on quantum mechanics, the science of atomic structure and function. The concept is that the atoms can be made to perform higher level gating functions rather than just be used to store 0s and 1s. It is believed that such a device can handle multiple operations simultaneously and can factor large numbers 10,000 times faster than today's computers. Although there are gigantic hurdles to overcome, scientists believe this will be feasible some time in the future. If quantum computing were to come about, the world of cryptography would undergo a dramatic change. In a short amount of time, such a device could be used to find the secret keys to all encryption algorithms.

Quarantine _ To move a virus-infected file to a folder that is not easily accessed by regular file management utilities. The quarantine option is available in antivirus software so that companies can keep a record of who has been infected, where the file came from and to possibly to send the virus to the antivirus vendor for inspection.

Quartz Crystal _ A slice of quartz ground to a prescribed thickness that vibrates at a steady frequency when stimulated by electricity. The tiny crystal, about 1/20th by 1/5th of an inch, creates the computer's heartbeat.

Queue _ A first-in-first-out (FIFO) data structure used to sequence multiple demands for a resource such as a printer, processor, or communications channel. The host adds objects to the end of the queue and takes them off the front.

QuickTime _ Video (and audio) container format developed by Apple. QuickTime is like AVI or ASF, because it doesn't define the actual compression technology the video has to use, but just defines the video structure instead. Introduced with System 7 on the Mac, a QuickTime file can contain any kind of continuous motion data such as audio, video, MIDI, animations, virtual reality, Karaoke text and time-based control information. QuickTime files use .QT, .MOV and .MOOV extensions. There are a huge variety of products that support QuickTime authoring. Despite this, term QuickTime is normally used to refer to Apple's own (or licensed) video encoding technology that used to produce rather poor video quality - something that could be compared to RealVideo format. Recently (since 2002), Apple has started using MPEG-4 video encoding on its QT streams, producing much better, if not excellent, video quality. Reason for this has been the huge demand from Hollywood to come up with an universal standard - such as MPEG-4 - that would produce good quality video for broadband use. Now numerous computer-based editing systems use QuickTime as an internal data format. QuickTime video sequences can contain an audio track and are stored as .MOV files.

Quicktime VR _ The virtual reality version of QuickTime. It allows subjects to be viewed on screen in 3-D space. Scenes are compiled from renderings or from multiple still shots taken of all sides.

QVGA _ *Quarter-VGA* resolution (320 x 240) motion video sequences.

QXGA _ QXGA is used to define a specific display resolution. Resolution is defined by the number of individual dots that a display uses to create an image. A QXGA display has 2048 horizontal pixels and 1536 vertical pixels giving a total display resolution of 3,145,728 individual pixels that are used to compose the image delivered by a projector. A QXGA display has 4 times the resolution of an XGA display.

R

R"-Y" _ In video, the red-minus-luma signal, also called a color difference signal. When added to the luma (Y") signal, it produces the red video signal **R-Y/B-Y:** Red minus luminance/Blue minus luminance.

Radial Path _ The straight-line path from the center of the disk to the outer edge of the disk.

Radial Wipe Transition _ A transition that sweeps away the outgoing clip with a circular or semi-circular motion to reveal the incoming clip.

Radio Frequency _ RF Any of the electromagnetic wave frequencies within the range that extends from below 3 kHz to approximately 300 GHz, and include the frequencies used for radio and television transmissions. For television transmissions, a composite video signal is superimposed onto a very high radio frequency capable of being broadcast through the atmosphere. Standard televisions receive these video signals, separate the composite signal from the radio frequency, and then decode and display the composite signal.

Radiosity _ There is a new method of rendering that was recently developed. It is called radiosity. It does something all the other rendering methods don't do: it figures out the relationship in the scene of all the objects present. For example, in real life, if you take a bright colored ball and put it into a white room, the walls of the room are going to reflect a little bit of color from the ball, making them look a little reddish for example. This is not possible in raytracing, since it does not bounce rays off of matte objects, such as a wall. You can compare the above picture to the one of the raytraced object. Although this is not a very good example, you can see that the checkerboard pattern of the "tri-ball" has a slight effect on the color of the bricks right underneath it. This adds the extra thing to rendered scenes and makes them look extremely realistic. Radiosity produces extremely good results, but unfortunately, there is a tradeoff: rendering time. Before the computer even starts rendering, it has to solve a certain "radiosity model" which is the relationship of one object on all the other ones in a scene. Then it can start rendering.

RAID _ *Redundant Array of Independent Disks* - A grouping of standard disk drives together with a RAID controller to create storage that acts as one disk to provide performance beyond that available from individual drives. Primarily designed for operation with computers, RAIDs can offer very high capacities, fast data transfer rates and much increased security of data. The latter is achieved through disk redundancy so that disk errors or failures can be detected and corrected. While RAIDs are the backbone of most of the hard disk recorders and servers, they are also increasingly used in conjunction with editing systems to maximize sustained data rate, and achieve best image quality. A series of RAID configurations is defined by levels and, being designed by computer people, they start counting from zero.

RAID Level _ RAID 0: Several hard disks are operated in striping mode. During this process the data is distributed to the various disks. While this process does not offer an increased level of data security, the write/read rate is very high. RAID 1: The data is mirrored, i.e. written to two disks. While this process requires double storage space, it offers a high level of data security. RAID 2: Similar to RAID-1 arrays, but this level requires even more storage space as additional error correction is implemented. RAID 3: Frequently used for disk recorders and servers. These arrays are highly efficient and, compared to RAID 0, offer an increased level of data security by storing back-up information on an additional disk which can be used to reconstruct data even if one of the other disks of the arrays fails to operate. RAID 4: Based on RAID 3 but in contrast to that, it is also possible to transmit smaller data blocks. RAID 5: Read access processes can be administrated in parallel, and are hence distributed to all drives. Otherwise as for level 4. RAID 6: Highest reliability, but not widely used. Similar to RAID 5, but does two different parity computations or the same computation on overlapping subsets of the data. RAID 10: Actually RAID 1,0. A combination of RAID 1 and 0 (mirroring and striping).

RAM _ *Random Access Memory* - The most common type of computer memory; where the CPU stores software, programs, and data currently being used. RAM is usually volatile memory, meaning that when the computer is turned off, crashes, or loses power, the contents of the memory are lost. A large amount of RAM usually offers faster manipulation or faster background processing. This is the fastest type of memory for the computer and the most expensive. There are several types of RAM. S-RAM, Static RAM, is the most expensive type of RAM found in onboard memory units, some printers, and in PCMCIA Type I Cards. D-RAM, Dynamic RAM, is most often seen as the expandable RAM used by the computer for memory.

RAM Disk _ A disk drive simulated in memory. To use it, files are copied from magnetic disk into the RAM disk. Processing is faster, because there's no mechanical disk action, only memory transfers. Updated data files must be copied back to disk before the power is turned off, otherwise the updates are lost.

RAM Resident _ Refers to programs that remain in memory in order to interact with other programs or to be instantly popped up when required by the user.

RAMbo Drive _ A DVD-RAM drive capable of reading and writing CD-R and CD-RW media. RAMbo is a play on the word combo.

RAMDAC _ *Random Access Memory Digital to Analog Converter* - The VGA controller chip that maintains the color palette and converts data from memory into analog signals for the monitor. The speed of the RAMDAC (e.g. 220, 250, 300, 350MHz) tells the maximum master clock rate, or video clock rate (VCLK) the image can be displayed at. You can calculate the maximum refresh rate for a resolution using a simple formula: VCLK/(height*width) = refresh rate

Random Erase _ The ability to erase a single file at a time from a CD-ReWritable CD, freeing up CD space for immediate re-use, just as you would do on a hard or floppy disk.

Raster _ A raster is the series of scan lines that make up a TV picture or a computer's display. The term "raster line" is the same as scan line. All of the scan lines that make up a frame of video form a raster. Lines and rows of dots such as those on the illuminated face of a video screen. A matrix of pixels or the scan lines on a CRT**.**

Raster Image _ Raster images are made up of individual dots; each of which have a defined value that precisely identifies its specific color, size and place within the image.

Rate Conversion _ a) The process of converting from one digital sample rate to another. The digital sample rate for the component digital video format is 13.5 MHz. For the composite digital video format, it is either 14.3 MHz for NTSC or 17.7 MHz for PAL. **_ b)** Often used incorrectly to indicate both resampling of digital rates and encoding/decoding.

RAW _ RAW digicam files basically hand the raw unprocessed data - at 12 bits per channel - from the camera's imaging chip to your computer. Lossless compression is applied to reduce file size slightly without compromising any quality.

Raw Data _ Data that has not been processed in any manner. It often refers to uncompressed text that is not stored in any proprietary format. It may also refer to recently captured data that may have been placed into a database structure, but not yet processed.

RAW File Format _ Refers to a myriad of proprietary formats that contain data that has not be processed (not compressed, not encrypted). It usually refers to graphics data, but could refer to any type of data. For example, digital cameras often a RAW option as output, which contains the most pixel information captured by the camera and is essentially an exact copy of the contents of memory. File header data may be optional or required.

Raw Footage _ Original, unedited film or video footage that has not been modified.

Raw VBI Data _ A technique where VBI data (such as teletext and captioning data) is sampled by a fast sample clock (i.e. 27 MHz), and output. This technique allows software decoding of the VBI data to be done.

Ray Tracing _ A shading model that takes into account the direct light sources, as well as all the reflected, refracted and transmitted light in a scene. It follows a light path from a specific source and computes each pixel in the image to simulate the effect of the light. It is a very process-intensive operation.

RBF _ *Random Block File* - a Microsoft OS9 standard file system. real time - any process which happens "live" is called a real time process, or any process which takes "real time" to perform, will take what is considered to be "normal" time.

RCTC _ *Rewritable Consumer Timecode* Sony developed the RCTC for consumer devices of the Video8 and Hi8 format. The RCTC is recorded in a special tape range between picture and sound information. With devices that are equipped accordingly, the RCTC can be recorded later on any Hi8 or Video8 tape. Any timecode that may already be present is overwritten in this process. During playback, the RCTC is read separately by the tape and output as a separate signal via the LANC remote terminal of these devices.

R-DAT _ Digital tape machine using a rotating head system.

RDRAM _ *Rambus DRAM* - A dynamic RAM chip technology. Concurrent RDRAMs have been used in video games, but Direct RDRAMs are used in computers. Direct RDRAM chips are housed in RIMM modules that look like the DIMM modules that contain SDRAM chips. However, RIMMs have different pin settings and are not at all interchangeable with DIMMs and SDRAM. Direct RDRAM chips can also be built with dual channels, doubling the transfer rate to 3.2 GBps.

Read Before Write _ A feature of some videotape recorders that plays back the video or audio signal off of tape before it reaches the record heads, sends the signal to an external device for modification, and then applies the modified signal to the record heads so that it can be re-recorded onto the tape in its original position.

Read Channel _ Performs the data encoding and conversions the drive needs to write computer generated information onto a magnetic medium and then read that information back with a high degree of accuracy.

Read Verify _ A data accuracy check performed by having the disk read data to the controller, which in turn checks for errors but does not pass the data on to the system.

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.

Real Player _ This is the software that you'll need on your computer to be able to play what's known as Real Audio or Real Video files over the Internet.

Real Time _ The process of computing a task immediately rather than via pre-preparation or at a deferred stage.

Real Time Gaming _ When a game is referred to as being in "real time," the system is calculating everything in the gameworld piece by piece, as it happens. The term is especially applicable to graphics. When the graphics are being produced in real time, the player can move around them with complete control. Any game that allows 3D freedom of movement is calculated in real time; Super Mario 64 is a fine example.

Real Time Image Processing _ A data processing system that responds immediately to the user. Image processing that executes each function immediately and displays it at a high enough resolution to be viewed.

RealMedia _ Architecture designed specifically for the Web, featuring multimedia streaming and low data-rate compression options. RealMedia works with or without a RealMedia server.

Realtime Compression _ The ability to compress and decompress data without any noticeable loss in speed compared to non-compressed data. PC products such as Stacker and SuperStor let you create a separate compressed drive on your hard disk. All data written to that drive is compressed and decompressed when read back. Realtime compression is included in DOS starting with DOS 6.

Real-Time Editing _ A reference to the amount of time it takes to make an edit in video. Many computer video editing systems require "render time" which means, the amount of time the computer requires to calculate alterations in the video image. For example, if you fade from one shot to another, the computer has to "render" those frames inbetween the two shots. This takes time for the computer to complete the task. In a real time system, the computer calculates the effect and renders it in the actual amount of time the effect would take. For example, if you have a fade from one scene to another which takes 5 seconds to complete, a real time editor will render the fade in 5 seconds.

Real-time Strategy Games _ Like first-person shooters, real-time strategy games found their beginnings on PCs, with games like Dune 2 and Warcraft. Real-time strategy games are played from an overhead perspective with the player controlling a small en-

campment of troops. Through gathered resources and researched technology, more advanced buildings, defenses, and troops can be built. The object is generally to obliterate another player's base, whether the opponent is computer controlled or human. RTS games are also similar to first-person shooters in that they offer multiplayer environments in which several players can compete. *Command & Conquer* and the *Warcraft* series are probably the most well-known real-time strategy games.

Realtime Video _ The ability to transmit live video without delay and without missing frames. Realtime implies that while the camera is shooting, video data are transmitted and viewed at the other end. Videoconferencing places the greatest realtime demand on networks, which must support video coming in and going out at the same time. If video data is just copied from one system to another, it is not realtime.

RealVideo _ Streaming video format developed by RealNetworks. RealVideo is probably the most popular streaming video format in the world, although its quality is horrible if you compare it to MPEG-4-based formats like DivX or WMV.

Reboot _ This is the term used to mean what you are doing when you shut down your computer (after installing software) and then restart it. It also applies to a crash.

Receiver _ A device that tunes in an analog or digital TV broadcast. A digital receiver, which also decodes the signal, can be built into the television or work as part of another piece of equipment, like a set-top box. Just as a home stereo receiver tunes in the radio station and sends music to the amplifier and speakers, a digital television receiver pulls in frequencies from a TV antenna, satellite signal, or cable connection and delivers a channel to your set.

Reception Mode _ one of four basic configurations used by a synthesizer that determines how it will respond to incoming data.

Reclocking _ With respect to a digital signal, the process of regenerating the original data with a regenerated clock with the same integer value before sending the digital signal through the circuit. Device inputs may provide a range of reclocking capabilities, as may device outputs. If the data clock value is not common between the send and the receive side, reclocking should be turned off or the signal will not properly pass. Data is reclocked in order to assist the next receiving device or the next circuit in line with the data path to help recover the digital signal should the path or circuit be overly long or otherwise out of the range of the input amplifier.

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

Recorder _ The term "recorder" refers to various types of recording devices. During linear editing the recording device is referred to as the recorder. The master is recorded by the recorder; the slave device is called the player.

Recoverable Error _ A read error, transient or otherwise, that the drive can correct by ECC recovery or by re-reading the data.

Rectangular Pixels _ Pixels that are not "square pixels" are "rectangular pixels".

Red Book _ The formal standard for the audio compact disc, developed by Philips and Sony in 1982.

Reference Clip _ A clip created from a source clip when the source clip is placed on the time line in the sequencer. A reference clip does not contain any digitized media but refers to the digitized source clip. A reference clip only exists in a sequence and is the only kind of clip that a sequence contains.

Reference Movie _ A *metafile* in the QuickTime architecture, used to invoke the QuickTime player and/or to refer the browser to an adaptive bit rate (MBR) file.

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.

Reflections _ With video signals, reflections can be caused by energy that is not absorbed by the load (or a termination), and is reflected and possibly combined with the original signal. Reflected signals can occur when the impedance does not match (as a result of wrong termination or mixing of cable impedance). Some of the undesirable results of reflection include Y/C delays, color smearing, ringing on luma (but not on color), and ghosts.

Refresh Rate _ This is a standard measure of how fast a computer screen is redrawn. The faster the page refreshes the better If it is very slow you could end up with eye strain.

Refreshment _ The transfer of digital files to a new media on a regular basis. This is the most important part of an institution's long-term commitment to digitization. Technology is usually outdated by the time it hits the marketplace. The data we generate today must be retrievable five, fifty, and a hundred years from now. In order to ensure long-term access to the data, it must be transferred to the most recent and stable type of media storage. In a hundred years, it is very unlikely that any of the computers on our desks today will function. We must make sure that the data can be retrieved by future technology.

Region Codes _ DVDs and players are encoded to perform only in certain geographical regions. For example, DVDs in North America are encoded "Region 1." Only Region 1 players will play a Region 1 disc. Some, but not many, of DVDs are coded "region 0", thus playable everywhere. Region codes are controlled normally by the DVD players. According to DVD Forum (the association that controls DVD patents) rules, all DVD-Video capable stand-alone players need to have region control measurements built-in. The region controls are also implemented in Pac's DVD-ROM drives, normally in three levels. First of all, if the DVD-ROM drive is manufactured after 1st of January, 2000, the drive itself has physical locks implemented in it to permit playback of only specific region code. Secondly, all newer operating systems, including Windows 2000 and Windows XP, have region control measurements built-in. And finally, the DVD player software, such as WinDVD or PowerDVD, have region control measurements built-in.

Registry _ The place where details of Births, Marriages and Deaths are held. The computer equivalent is quite similar. It's a database used and maintained by Windows which stores information about how your computer is configured, the software and the drivers, etc. The Registry is made up of the SYSTEM.DAT and USER.DAT files. The Registry can be edited directly, but that is usually only done for very technical enhancements or as a last resort.

Relay _ A device that acts like a switch and is controlled by a current. The relay switch contacts then controls another circuit to pass a signal. Most relays are either solid state or electromagnetic.

Release _ The time taken for a level or gain to return to normal. Often used to describe the rate at which a synthesized sound reduces in level after a key has been released.

Remote Diagnostics _ Diagnostics can often be run locally from a terminal (or a PC with terminal emulation software). Equally the terminal can be remote, connected via a modem and a phone line. This way any suitably configured equipment in any location (with a phone line) can be checked, and sometimes corrected, by specialist service personnel.

Removable Media _ Offline storage devices - those which are not part of the main computer system, such as tape and disk storage drives.

Render _ To compute an image or effect using a nonlinear editing, compositing, or animation program. The result is generally saved in a file on the computer. Also, the processing of a series of individual clips, transitions and filters into a single playable track. This process can take a while and is a process that depends on how much RAM you have, how fast your CPU is, and how long the video production is and how many effect you are using. There are several types of rendering – Wire Frame, Flat Shading, Gourad, Phong, Ray Tracing and Radiosity.

Render Time _ Rendering is a computer video editing (and computer animation) term which means the computer is making a calculation of some sort. It is a reference to the amount of time it takes to make an edit in video. Many computer video editing systems require "render time" which means, the amount of time the computer requires to calculate alterations in the video image.

Rendering Engine _ generically applies to the part of the graphics engine that draws 3D primitives, usually triangles or other simple polygons. In most implementations, the rendering engine is responsible for interpolation of edges and "filling in" the triangle.

Replicate _ A technique for increasing the size of a graphics file through pixel duplication.

Resampling _ Resizing an image by reducing or increasing its number of pixels. An image can also be resized for printing without resampling and altering its physical structure. If resampling is turned off in the resizing dialog in Photoshop or other image editor, changing the print size changes only the resolution that will be used to convert the image to paper. If the print size is decreased by 50%, the resolution will be increased by 50% and vice versa.

Resident Module _ The part of a program that must remain in memory at all times. Instructions and data that remain in memory can be accessed instantly.

Resident Program _ A program that remains in memory at all times

Residual Subcarrier _ This is the amount of color subcarrier information present in white, gray, or black areas of a composite color video signal (ideally, there is none present). The number usually appears as -n dB. The larger "n" is, the better.

Resize _ To change the size of a digital image. Most graphic viewing and editing programs offer a Resize option for this purpose.

Resolution (horizontal) _ The amount of detail in a horizontal direction in a video image. It is expressed as the number of distinct vertical lines, alternately black and white that can be seen in ¾ the width of the picture. This information is usually derived from observation of the vertical wedge of the test pattern. Horizontal resolution depends on the high frequency amplitude and phase response of the pickup equipment, as well as the transmission medium and the monitor, itself.

Resolution (vertical) _ The amount of resolvable detail in a vertical direction in a video image. It is expressed as the number of distinct horizontal lines, alternately black and white, that can be seen in a test pattern. Vertical resolution is primarily determined by the number of horizontal scanning lines in a frame.

Resolution _ a) Detail. In digital video and audio, the number of bits (four, eight, 10, 12, etc.) determines the resolution of the digital signal. Four bits yields a resolution of one in 16. Eight bits yields a resolution of one in 256. Ten bits yields a resolution of one in 1,024. Eight bits is the minimum acceptable for broadcast television. _ **b)** A measure of the finest detail that can be seen, or resolved, in a reproduced image. While influenced by the number of pixels in an image (for high definition approximately 2,000 x 1,000, broadcast NTSC TV 720 x 487, broadcast PAL TV 720 x 576), note that the pixel numbers do not define ultimate resolution but merely the resolution of that part of the equipment. The quality of lenses, display tubes, film process and film scanners, etc., used to produce the image on the screen must all be taken into account. This is why a live broadcast of the Olympic Games looks better than a broadcast recorded and played off of VHS, while all are NTSC or PAL.

Resolution Coexistence _ Term originated by Quantel to describe equipment designed to operate with several moving image formats at the same time. For example, an editing system able to store and operate with any DTV production format material, making transitions between shots, composing layers originating from more than one format (resolution) and outputting in any chosen format. Good equipment will be designed for fast operation at the largest specified TV format, e.g. 1920 x 1080 HD and so may operate faster with smaller images, but also may be able to handle larger images.

Resolution Independent _ A term used to describe the notion of equipment that can operate at more than one resolution. Most dedicated television equipment is designed to operate at a single resolution although some equipment, especially that using the ITUR BT.601 standard, can switch between the specific formats and aspect ratios of 525/60 and 625/50. More recently, the advent of the multiple formats of DTV have encouraged new equipment able to operate with a number of video standards. By their nature computers can handle files of almost any size so, when used to handle images, they can be termed "resolution independent". However as larger images require more processing, more storage and more bandwidth so, for a given platform, the speed of operation will slow as the resolution increases. Other considerations when changing image resolution include the need to reformat disks, to check for sufficient RAM, to allow extra time for RAM/disk caching and to select an appropriate display.

Resonant Frequency _ Any system has a resonance at some particular frequency. At that frequency, even a slight amount of energy can cause the system to vibrate. A stretched piano string, when plucked, will vibrate for a while at a certain fundamental frequency. Plucked again, it will again vibrate at that same frequency. This is its natural or resonant frequency. While this is the basis of musical instruments, it is undesirable in music-reproducing instruments like audio equipment.

Resonantware _ Term coined by NEC designers, describing devices that judge situations to meet user's needs, and interfaces that let users access unlimited information..

Resources _ The term used to describe anything you draw upon and need for a particular task. For example, emailing a large file requires network resources, which include the size of the server, the speed of connection, scalability and so on.

Restricted E-mail Transfer Size _ An ISP may well impose a limit on the size of E-mail that you can send, and as attaching files to E-mails has become the norm nowadays, you might wish to know exactly what this limit is. It's usually in the region of 2-4 Mb.

Retrieval _ To bring back a file or information from internal or external medium.

Retro _ Not a *look,* but rather a rear-projection video display.

Return Loss _ A measure of reflected energy in decibels at a specific frequency and cable length.

Reverb _ Acoustic ambience created by multiple reflections in a confined space.

Reverse Out _ An image in which the black and white areas are exchanged from those of the original subject, but the relationship of left to right is the same as in the original. Usually, it is a white image or type on a black background.

RF _ Radio Frequency.

RF Signal _ The most common signal received from an antenna or cable service. It combines both video and audio in a single cable.

RGB _ The abbreviation for the Red, Green and Blue signals, the primary colors of television. Cameras and telecines have red, blue and green receptors, the TV screen has red, green and blue phosphors illuminated by red, green and blue guns. Much of the picture monitoring in a production centre is in RGB. RGB is digitized with 444 sampling which occupies 50% more data than 422.

RGB Color Model _ A color model. A large percentage of the visible spectrum can be represented by mixing red, green and blue (RGB) in various proportions and intensities. Where the colors overlap, they create cyan, magenta, and yellow. RGB colors are known as additive colors because they combine to form white. RGB colors are used for lighting, video and monitors.

RGB Monitor _ A color monitor that accepts separate red, green and blue input signals to produce a high quality picture.

RGB Sync _ Also **RGBS.** The red, blue and green chroma information in a video signal, with a separate channel for the sync signal.

RGB Video _ A form of color video signal (red, green and blue) distinctly different from the composite color video used in standard television sets. RGB can be displayed only on an RGB monitor that has a separate electron gun for each of these primary colors. Some color television sets use only one gun. RGB monitors are noted for their crisp, bright colors and high resolution. RGB video can have four different forms RGsB (sync is on the green signal), RGBS (sync is separate from the colors), RGBHV (sync is separate from the colors, and the horizontal and vertical sync signals are separate) and RsGsBs (sync on red, green and blue).

Rhythm (music/dancing) Games _ The rhythm action genre is a recent addition to gaming and goes back to the PlayStation's Parappa the Rapper. These games require the player to have a good sense of rhythm; in fact, most rhythm games are played simply by hitting the right button combinations to the beats of a song. The player's onscreen persona then sings, raps, or dances appropriately with the music.

Rich Content _ Digitized information other than text: photographs, music files, video, digital movies. Creates unprecedented demand for information storage capacity.

Rich Media _ Information that consists of any combination of graphics, audio, video and animation, which is more storage and bandwidth intensive than ordinary text. Another term for multimedia*.*

Ringing _ An oscillatory transient on a signal occurring as a result of bandwidth restrictions and/or phase distortions. A type of ringing causes ghosting in the video picture.

Rio _ The Rio was the first MP3 portable player. As such, its name has become almost synonymous with portable players in general.

RIP _ *Raster Image Process* - The method of converting vector data (for example fonts) into raster image form - making it suitable for use as, or in, a television picture. Vector data is size independent and so has to be RIPped to a given size. RIPping to produce high quality results requires significant processing - especially if interactive operation is required, for example to fit the result into a background.

Ripper _ A ripper is an application used to "rip" something, that is to take something from somewhere where you are not supposed to take it. An example of this is ripping a DVD movie to DivX format on your hard drive. This is of course illegal!

Ripping _ Ripping is the process of taking audio data from your CD and making it into a sound file on your computer. It is called ripping because in most cases the audio data is digitally "ripped" directly from the CD. This process can be very fast (a four minute song might only take 30 seconds to record). An analog recording process on the other hand records a song by playing the CD and recording the sound output. The analog process can only happen in real-time (a four minute song takes four minutes to record). The digital extraction process is faster because it copies the data instead of recording the sound output. Software applications that rip from CDs create the new audio file in the WAV or AIFF formats. Software applications that rip and encode usually create the new audio file in the MP3 format.

Ripple Edit _ Automatic forward or backward movement of program material in relationship to an inserted or extracted clip, or to a change in the duration of a clip.

RISC _ *Reduced Instruction Set Computing* - Device where the number of instructions a microprocessor runs for a specific application are reduced from a general purpose Complex Instruction Set Computing (CISC) device to create a more efficient operating system. RISC compilers have to generate software routines to perform complex instructions that were previously done in hardware by CISC computers. In RISC, the microcode layer and associated overhead is eliminated. RISC keeps instruction size constant, bans the indirect addressing mode and retains only those instructions that can be overlapped and made to execute in one machine cycle or less. The RISC chip is faster than its CISC counterpart and is designed and built more economically.

Rise Time _ The amount of time it takes for a signal to transition from one state to another. Rise time is usually measured between the 10% and 90% completion points of the transition. Shorter, or faster rise times require more bandwidth in a transmission channel.

RLE _ *Run-Length-Encoding* - is the lossless compression algorithm, usually compressed no more than 2:1, used most often on Windows *.bmp files. A run of pixels or bytes of the same color or value are coded as a single value recording the color or byte value and the number duplications in the run. RLE compressions are most often used in archiving image files that cannot sustain any loss in quality.

RLL _ *Run Length Limited* - An encoding scheme used during write operations to facilitate data readback.

Road Warrior _ A person who frequently travels with laptop and cellphone.

Roaming _ The ability to use a communications device such as a cellphone, PDA or laptop computer and be able to move from one cell or access point to another without losing the connection.

Robot _ A stand-alone hybrid computer system that performs physical and computational activities. It is a multiple-motion device with one or more arms and joints that is capable of performing many different tasks like a human. It can be designed similar to human form, although most industrial robots don't resemble people at all. Robots are designed for a multitude of applications. In manufacturing, they are used for welding, riveting, scraping and painting. They are also deployed for demolition, fire and bomb fighting, nuclear site inspection, industrial cleaning, laboratory use, medical surgery, agriculture, forestry, office mail delivery as well as a myriad of other tasks. Increasingly, more artificial intelligence is being added. For example, some robots can identify objects in a pile, select the objects in the appropriate sequence and as-

semble them into a unit. Robots use analog sensors for recognizing real-world objects and digital computers for their direction. Analog to digital converters convert temperature, motion, pressure, sound and images into binary code for the robot's computer. The computer directs the physical actions of the arms and joints by pulsing their motors.

Rock & Roll _ The ability of a projector and sound follower/s to operate in sync in forward or reverse, usually for the purpose of sound mixing.

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

Rogue Site _ A Web site that is set up to spread a virus, collect names for spammers or for some other illicit or repugnant purpose.

Role-playing Game _ The name originally referred to pen-and-paper games like Dungeons & Dragons, which became popular in the 1970s. The NES games Dragon Warrior and Final Fantasy then brought the idea to the video game era. Role-playing games, or RPGs, feature one character or a group of characters that embark on a quest, generally culminating in their world's salvation. RPGs involve an abnormally large amount of statistics and number crunching; everything from a character's health to weapon and armor strength is represented numerically. Role-playing games usually contain the deepest and most complex storylines of any game - Final Fantasy VIII's story moved more than a few players to tears. Popular RPGs include the Final Fantasy and Phantasy Star series.

Roll _ a) Unwanted vertical roll of a video image, indicating unstable sync. **_ b)** Vertical movement of text across the screen.

Rolling edit _ Automatic change in the duration of a program when a clip is inserted or extracted, or when the duration of a clip is altered.

Rolloff _ The rate at which a filter attenuates a signal once it has passed the filter cut-off point.

ROM _ *Read Only Memory* - Integrated circuit memory chip containing programs and data that the computer or host can read but cannot modify. The computer can read instructions out of ROM, but cannot store data in ROM. Usually ROM refers to specific electronics in a computer; however non-alterable disks like CDs or CD ROMs are another type of read only memory. Read Only Memory is nonvolatileit does not disappear when power is shut off. When computers are used in handheld instruments, appliances, automobiles and any other such devices, the instructions for their routines are generally stored in ROM chips or some other non-volatile chip such as EEPROMs or flash memory. Instructions may also be stored in a ROM section within a general-purpose computer on a chip.

Room Camera _ In videoconferencing this is the main camera in the room. There may be additional cameras in the room, as well.

Rotating _ To turn an image element around its axis. Rotation is generally more effectively accomplished by correct positioning during the scanning process.

Rotational Latency _ The amount of delay in obtaining information from a disk due to the rotation of the disk. For a disk rotating at 5400 RPM, the average rotational latency is 5.5 milliseconds.

Rotoscoping _ Also known as "roto", it is the practice of using frames of live footage as reference for painting animated sequences. Many old Disney films were animated in this way, shooting live actors and then drawing over them. Today, computer technology allows a greater range of options in creating effective and realistic rotoscoping. The most complicated example of a type of rotoscoping done to date in film is the "digital painting" developed in "What Dreams May Come" starring Robin Williams. An example of less elaborate rotoscoping would be drawing in the glow of light sabers in the "Star Wars" saga.

Rough Cut _ A preliminary version of a video production, often assembled from lower-quality clips than those used for the *final cut.*

Router _ A special purpose computer or software application that's capable of handling connections between several networks. It looks at the destination address of the packets of data being sent and decides which would be the best route to send that data.

Routine _ A set of instructions that perform a task.

Routing _ Forwarding data to its destination.

RS 232 _ A standard for serial data communications defined by EIA standard RS-232 and is designed for short distances only - up to 10 meters. It uses single ended signaling with a conductor per channel plus a common

ground, which is relatively cheap, easy to arrange but susceptible to interference - hence the distance limitation. It is also called RS-232-C, which is the third version of the RS-232 standard.

RS 422 _ A medium range (up to 300m) serial data transmission standard. Not to be confused with 4:2:2 sampling or 422P MPE., It uses current-loop, balanced signaling with a twisted pair of conductors per channel, two pairs for bi-directional operation. It is more costly than RS232 but has a high level of immunity to interference and can operate over reasonably long distances. RS 422 is widely used for control links around production and post areas for a range of equipment - VTRs, mixers, etc. It is also used as the serial port standard for Macintosh computers.

RSDL _ *Reverse Spiral Dual Layer* - This is a technique in which a movie is split across two layers of a single side of a DVD disc and is joined together for continuous playback. DVD players switch between the layers almost instantaneously, allowing more information to be stored on the same side of a disc and eliminating the need for "flipping." This transition is supported by all DVD- Video players.

RSN _ *Real Soon Now* - A phrase coined by Jerry Pournelle to satirize the tendency in the computer industry of discussing (and even offering for sale) things that are not actually available yet.

RSVP _ *Resource Reservation Protocol* is a control protocol that allows a receiver to request a specific quality of service level over an IP network. Real-time applications, such as streaming video, use RSVP to reserve necessary resources at routers along the transmission paths so that the requested bandwidth can be available when the transmission actually occurs.

RTCP _ *Real-Time Control Protocol* is a control protocol designed to work in conjunction with RTP. During a RTP session, participants periodically send RTCP packets to convey status on quality of service and membership management. RTCP also uses RSVP to reserve resources to guarantee a given quality of service.

RTP _ *Real-Time Transport Protocol* is a packet format and protocol for the transport of real-time audio and video data over an IP network. The data may be any file format, including MPEG-2, MPEG-4, ASF, Quick-Time, etc. Implementing time reconstruction, loss detection, security and content identifica-

tion, it also supports multicasting (one source to many receivers) and unicasting (one source to one receiver) of real-time audio and video. One-way transport (such as video-on-demand) as well as interactive services (such as Internet telephony) are supported.

RTSP _ *Real-Time Streaming Protocol* is a client-server protocol to enable controlled delivery of **streaming** audio and video over an IP network. It provides "VCR-style" remote control capabilities such as play, pause, fast forward, and reverse. The actual data delivery is done using **RTP**.

Rubber Banding _ In computer graphics, the moving of a line or object where one end stays fixed in position.

Ruggedized PC _ A portable computer that is designed for hazardous duty such as in police, fire and industrial applications. Although it commands a premium price, a ruggedized portable is crucial in these environments; however, since it can withstand being accidentally dropped, it is valuable for everybody. In a ruggedized machine, the keyboard is usually waterproof in order to tolerate spilled liquids, and the hard disk and screen are typically in vibration-damped mountings to withstand shock. If the hard drive is removable, it can be stored in a separate, secure environment during severe travel conditions. In addition, its removability allows the data to be easily transferred if the machine is damaged.

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

Run-length Coding _ A system for compressing data. The principle is to store a pixel value along with a message detailing the number of adjacent pixels with that same value. This gives a very efficient way of storing large areas of flat color and text but is not so efficient with pictures from a camera, where the random nature of the information, including noise, may actually mean that more data is produced than was needed for the original picture.

Runtime _ Refers to the actual execution of a program. "At runtime" means while the program is running.

Rushes (dailies) _ The unedited or selected go takes of the film or videotape.

S

S/N Ratio _ *Signal-to-noise ratio* - The ratio is measured in decibels, between the audio or video signal level and that of the noise accompanying the signal. The higher the S/N ratio, the better the quality of the sound or picture.

S/PDIF _ *Sony/Philips Digital Interface Format* - a format for linking consumer digital audio equipment together based upon the AES/EBU standard. S/PDIF typically uses unbalanced high impedance coaxial cables or fiber optical cables; however, high quality audio cables can be used for short lengths. Good 75-ohm cable and good 75-ohm connectors can provide lengths up to 25 feet.

SACD _ *Super Audio CD* - A high-resolution multi-channel digital audio CD format from Sony and Philips. SACD uses Direct Stream Digital (DS_ D) technology which provides 1-bit encoding at 2,822,400 samples per second. Each bit sample points up or down, representing the analog sound wave very accurately as it rises and falls. Compared to audio CDs, SACD boosts frequency response from 20,000 to 100,000 Hz and dynamic range from 96 to 120 db. Although SACD is a format primarily intended for stereo, multi-channel SACD discs are also supported. SACD players play both SACDs and CDs, and SACD hybrid discs include a separate CD layer so they can be played in CD players. In 1999, Sony's SCD-1 was the first SACD player on the market.

Safe (Action) Area _ The area of picture into which it is safe to place material, graphics, text or action, so that it will be viewable when received at home. Initially this was necessary with 4:3 aspect ratio screens as they were always overscanned to avoid showing the black that surrounds that active picture. Typically 5% in from the edges was considered safe. More recently the whole Safe Area issue has become far more complicated as there are both 4:3 and 16:9 displays, as well as 4:3, 16:9 and sometimes 14:9 (a compromised version of 16:9 that is more acceptable to those viewing on 4:3 screens) aspect ratios for program output.

Safe Mode _ The troubleshooting mode in Windows 95/98/2000/XP. It allows the system to boot when it otherwise may not, often due to conflicts from newly installed hardware. Only the mouse, keyboard and standard VGA drivers are loaded, and all configuration files are bypassed, including the Registry, CONFIG.SYS, AUTOEXEC.BAT and SYSTEM.INI. Windows may automatically boot up in this mode if the previous session was not shut down properly.

Safety Critical _ Applications where the presence of bugs or other logical flaws in software cannot be tolerated, e.g. air traffic control. Formal methods are often used in the design of such software.

Sample _ To obtain values of a signal at periodic intervals. Also the value of a signal at a given moment in time.

Sample and Hold _ Usually refers to a feature whereby random values are generated at regular intervals and then used to control another function such as pitch or filter frequency. Sample and hold circuits were also used in old analog synthesizers to remember the note being played after a key had been released.

Sample Rate _ A digital representation of an analog signal created by checking, or sampling, the analog voltage a fixed number of times per second. The greater the number of samples, the more accurate the representation of the analog signal. The CD uses a sampling rate of 44.1kHz; it checks the analog signal 44,100 times per second.

Sampler _ an electronic device that can record, alter and playback digital audio data under the control of a MIDI data stream.

Sampling (clock) Frequency _ The (clock) frequency at which the picture signal is sampled is crucial to the accuracy of analogue to digital conversion. The object is to be able, at some later stage, to faithfully reconstruct the original analogue signal. Clearly using too high a frequency is wasteful whereas too low a frequency will result in aliasing - so generating artifacts.

Sampling _ Process by which an analog signal is measured, often millions of times per second for video, in order to convert the analog signal to digital. The official sampling standard for standard definition television is

ITU-R 601. For TV pictures eight or 10 bits are normally used; for sound, 16 or 20-bits are common, and 24-bits are being introduced. The ITU-R 601 standard defines the sampling of video components based on 13.5 MHz, and AES/EBU defines sampling of 44.1 and 48 kHz for audio.

Sampling and Digitization _ The low-pass filtered signals of the correct amplitudes are then passed to the ADCs where they are sampled and digitized. Normally two ADCs are used, one for the luminance Y, and the other for both color difference signals, R-Y and B-Y. Within the active picture the ADCs take a sample of the analogue signals (to create pixels) each time they receive a clock pulse (generated from the sync signal). For Y the clock frequency is 13.5 MHz and for each color difference channel half that - 6.75 MHz - making a total sampling rate of 27 MHz. Note that the digitized forms of R-Y and B -Y are referred as Cr and Cb.

Sampling Frequency _ The number of discrete sample measurements taken from an analog signal in a second, often expressed in megahertz for video. These samples are then converted into digital numeric values to create the digital signal.

Sampling Rate _ is the rate at which an analog signal is sampled for conversion to and from the digital domain. The sampling rate is measured as the number of samples per unit of time. The higher the sampling rate, the better the quality.

Sampling Standard _ A standard for sampling analogue waveforms to convert them into digital data. The official sampling standard for 625/50 and 525/60 television is ITUR BT.601. ITU-R BT.709 specifies sampling for some HD formats.

Samurai _ A technical professional who is paid to break into a computer system in order to test its security.

SAN _ *Storage Area Network* - A network that allows applications direct access to shared storage by cutting out the usual client-server "middle men". This may be used to provide improved workflow and better work-sharing on a common store. For this the application has to be "storage aware" as the scheme effectively connects shared storage to the workstations - in a similar way to local disk drives. A SAN is not networking in the conventional sense. Whereas networking usually transfers data between applications, with indirect access to data, a SAN primarily connects applications to data with indirect access to other applications.

Sandbox _ A restricted environment in which certain functions are prohibited. For example, deleting files and modifying system information such as registry settings and other control panel functions may be prohibited. Sandboxes are used when executable code has come from an external source that is not entirely trusted.

Saturation _ Chroma, chroma gain. The intensity of the color, or the extent to which a given color in any image is free from white. The less white in a color, the truer the color, or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.

Saturn _ Developed and released around the same time as the Playstation in 1995, the CD-based 32 bit Sega Saturn failed to last more than 3 years and died with only a tiny fraction of the sales that PlayStation achieved.

SAV _ *Start of active video* - A synchronizing signal used in component digital video.

Sawtooth Wave _ So called because it resembles the teeth of a saw, this waveform contains both odd and even harmonics.

SBP-2 _ *Serial Bus Protocol-2* - Specification that defines the protocol for command and data transfer of mass storage devices using the IEEE 1394 (FireWire) bus. It describes the basic transport protocol for mass storage devices, and specifies the data structures and operations above the transaction layer that provide efficient mechanisms for this class of devices.

SBR _ *Spectral Bandwidth Replication* - is an audio enhancement technology designed especially for low bitrate audio and speech codecs. It improves the perceived audio quality by increasing the bandwidth at a low bitrate, and by increasing the coding efficiency of the underlying codec by limiting its bandwidth. SBR method can be used with any codec capable of producing an acceptable audio quality at the given level. The codec transmits the lower frequencies of the spec-

trum, and the SBR algorithm takes care of the higher frequencies. The SBR decoder generates the frequencies mostly by analyzing the lower frequencies, with a little help from low-data rate guidance information. SBR has applications wherever bandwidth is limited. For example in Internet radio broadcasts, and mobile audio communications. It can be used for mono, stereo, or even multi-channel audio.

SC Phase _ The phase of the color subcarrier.

SC/H Phase _ *Subcarrier to horizontal phase* - In NTSC video, this is the phase relationship of the subcarrier to the leading edge of horizontal sync. SC/H phase is correct when the zero crossing of subcarrier is aligned with the 50% point of the leading edge of sync. In PAL video, the SC/H phase is defined as the phase of the EU component of the color burst extrapolated to the half amplitude point of the leading edge of synchronizing pulse of line 1 of field 1.

Scalability _ Refers to how much a system can be expanded. The term by itself implies a positive capability. For example, "the device is known for its scalability" means that it can be made to serve a larger number of users without breaking down or requiring major changes in procedure.

Scalable Coding _ The ability to encode a visual sequence so as to enable the decoding of the digital data stream at various spatial and/or temporal resolutions. Scalable compression techniques typically filter the image into separate bands of spatial and/or temporal data. Appropriate data reduction techniques are then applied to each band to match the response characteristics of human vision.

Scalable Video _ Refers to video compression that can handle a range of bandwidths, scaling smoothly over them.

Scale _ To enlarge or reduce an image by increasing or decreasing the number of scanned pixels.

Scaling _ a) Scaling is the act of changing the resolution of an image. For example, scaling a 640 x 480 image by one-half results in a 320 x 240 image. Scaling by 2x results in an image that is 1280 x 960. There are many different methods for image scaling, and some "look" better than others. In general, though, the better the algorithm "looks", the more expensive it is to implement. **_ b)** Analogue video signals have to be scaled prior to digitizing in an ADC so that the full amplitude of the signal makes best use of the available levels in the digital system. The ITU-R BT.601 digital coding standard specifies, when using 8 bits, black to be set at level 16 and white at 235. The same range of values is ascribed should RGB be used. Computer systems tend to operate with a different scaling black set to level 0 and white at 255. For color they usually use RGB from 0-255. Clearly, going between computers and TV requires processing to change color space and scaling.

SCAM _ *SCSI Configure AutoMagically* Allows users to attach SCSI devices without worrying about configuration options.

Scan _ In video, to move an electron beam across the raster in a camera or monitor. To feed visual information into a computer by means of an optical device called a scanner.

Scan Converter _ A device that changes the scan rate of a video signal and may also convert the signal from noninterlaced to interlaced mode. A scan converter enables computer graphics to be recorded onto videotape or displayed on a standard video monitor.

Scan Doubler _ A device used to change composite interlaced video to noninterlaced component video, thereby increasing brightness and picture quality. Also called "line doubler".

Scan Line _ A scan line is an individual line across the display. It takes 525 of these scan lines to make up a NTSC TV picture and 625 scan lines to make up a PAL TV picture. Almost always, this term refers to active scan lines

Scan Rate _ The length of time an electron gun takes to move across one line of the screen (horizontal scan rate), or to repeat one entire screen (vertical scan rate). Computer monitor scan rates differ from those of standard video display devices.

Scan Velocity Modulation _ Varies the scanning speed of the electron beam to accommodate light/dark transitions. This increases contrast at image edges for a clear, well-defined picture.

Scan-doubling _ The process of making the scan lines less visible by doubling the number of lines and filling in the blank spaces. Also called "linedoubling".

Scanned Image _ The computer picture that results when a photograph, slide, paper image, or other two or three dimensional images are converted into a digital image.

Scanner _ A device for capturing a digital image. There are many types of scanners, such as flatbed scanners, drum scanners, slide scanners, and microfilm scanners. The scanner does not recognize the content of the printed material it is scanning. Everything on the page (text and graphics objects) is converted into one bitmapped graphics image (bitmap), which is a pattern of dots. Scanners are optical devices that use CCDs to record the image. They are rated in dots per inch (dpi), and just like digital cameras, they have an optical resolution (the real resolution based on the lenses) and an interpolated resolution, which is computed by software. They are also rated by the maximum bit depth of each pixel. At minimum, scanners support 24-bit color, and many go up to 48 bits.

Scanning _ The movement of the election beam in the CRT of a television receiver or in the pickup device of a camera. The electron beam moves line-by-line across the photo sensitive surface, producing the video picture.

SCART _ *Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs* - This is a 21-pin connector supported by many consumer video components in Europe. It allows mono or stereo audio and composite, s-video, or RGB video to be transmitted between equipment.

SCH _ Subcarrier to Horizontal sync timing relationship. Chrominance information in PAL and NTSC is borne by a color subcarrier whose frequency is mathematically related to the line and field scanning rates. PAL and NTSC expect this relationship to remain fixed otherwise the picture may hop, jump or be subjected to further processing (if available) which may change its quality.

Scissors Clip _ Test pixel coordinates against clip rectangles and reject them if outside.

Scrambling _ a) To transpose or invert digital data according to a prearranged scheme in order to break up the low-frequency patterns associated with serial digital signals. **_ b)** The digital signal is shuffled to produce a better spectral distribution.

Scratch Disks _ The user-defined hard disk location where an application stores temporary and preview files.

Screener _ One of the multiple terms used by movie pirates to describe the source material/copying method that was used to make a bootlegged VCD, SVCD or DivX copy of a movie. Screener normally refers to a copy made from either VHS tape or from DVD-Video disc that are sent to movie critics and censors before the movie is available to public through video rental chains. Normally refers to a very good quality bootlegged copy.

Screensaver _ Special software installed on your computer that replaces your normal desktop screen image with pictures of moving objects after a pre-set period of mouse inactivity.

Scripting Language _ A series of programmed commands that specify how one computer will talk to another.

ScriptLink _ PC based software program for laptops, designed to correlate script and slate related information (film title, scene, take, camera roll, sound roll, camera ID, good/no good take, and two comment fields) locked to AatonCode.

Scrubbing _ Variable-rate backward or forward movement through audio or video material via a mouse, keyboard or other device.

SCSI _ *Small Computer System Interface* - a high speed standardized means for connecting hard drives, CD-ROMs, and peripheral devices to a computer. SCSI, is a set of ANSI standard electronic interfaces that allow personal computers to communicate with peripheral hardware such as disk drives, tape drives, CD-ROM drives, printers, and scanners faster and more flexibly than previous interfaces. Developed at Apple Computer and still used in the Macintosh, the present set of SCSIs are parallel interfaces. Improvements in the number of data lines and speed have been made to the original SCSI to become SCSI-2 and SCSI-3. SCSI ports continue to be built into many personal computers today and are supported by all major operating systems. SCSI is faster than RS-232-C, but is still obsolete when compared to the USB interface.

SD _ Secure Digital card, a flash memory card used in digicams and MP3 players. It is identical in size and shape to the MultiMedia Card (MMC) flash cards. The difference being that SD cards were designed to hold protected (copyrighted) data like songs. Not all cameras that use SD cards can use MMC cards. Although its encryption capability supports security and content protection applications, the SD Memory Cards initial usage has been mostly regular storage due to its fast transfer rate compared to other cards. The transfer rate of 256MB and 512MB SD Cards is 10 Mbytes/sec; the 1GB SD Card is 20 MB/sec. SD Cards use NAND flash technology. Introduced in 1999 by Panasonic, Toshiba and SanDisk, the first devices to use the cards came on the market a year later. In 2003, the Mini SD Card was introduced with capacities up to 64MB and a footprint less than 40% of the full-sized card. Electrically as well as software compatible with the full-size card, a Mini SD card can fit into a regular SD slot via an adapter. Consumer and professional camcorders using high capacity SD cards are already in the testing phase.

SDDS _ Sony Dynamic Digital Sound - a multi-channel (5.1 or 7.1) digital format developed by Sony for theatrical film. The SDDS sound track is recorded optically as microscopic pits similar to a CD along both outer edges of the 35mm film strip. An SDDS reader is mounted on the projector, and red LEDs read the pits and convert them into digital data. Using a 5:1 compression, SDDS supports 6-channel and 8-channel auditoriums.

SDI _ Serial Digital Interface - a communications standard for broadcast digital equipment that specifies data be transmitted and received one bit at a time over a single line. The standard is based in a 270 Mbit/sec transfer rate. A 10 bit, scrambled, polarity independent interface, with common scrambling for both component CCIR 61 and composite digital video and four channels of digital audio. It uses the standard 75 Ohm BNC connector and a coax cable that is commonly used for analogue video.

SDK _ Software Developers Kit - Typically a software and documentation package to facilitate the development of applications to run on a given operating system or other application.

SDMI _ Secure Digital Music Initiative - A set of rules for securely distributing digital music over the Internet. Announced in February 1999, it is backed by the Recording Industry Association of America (RIAA) and Sony, Warner, BMG, EMI and Universal, the top five music production companies. SDMI provides the guidelines for developing compliant digital rights management (DRM) systems.

SDRAM _ Synchronous DRAM - A type of dynamic RAM memory chip that has been widely used starting in the latter part of the 1990s. SDRAMs are based on standard dynamic RAM chips, but have sophisticated features that make them considerably faster. First, SDRAM chips are fast enough to be synchronized with the Cup's clock, which eliminates wait states. Second, the SDRAM chip is divided into two cell blocks, and data are interleaved between the two so that while a bit in one block is being accessed, the bit in the other is being prepared for access. This allows SDRAM to burst the second and subsequent, contiguous characters at a rate of 10ns, compared to 60ns for the first character.

SDSL _ Symmetrical DSL - where the data rate is the same in both directions.

SDTI _ Serial Digital Transport Interface is based on SDI and uses the same physical bases, i.e. cables and sockets. The development of SDTI originated from the desire to be able to copy even compressed digital signals directly and to distribute them via studio infrastructures. Initially, Sony and Panasonic developed various format-specific interfaces SCDI for DVCPro, QSDI for DVCAM and SDDI for Betacam SX. SDTI brings these starting points under one umbrella, but only determines the data transmission method and not the data format. The SDTI standard regulates the external form of the signal stream such that the signal can be distributed via SDI infrastructures. The type of useful data which is transported in this fashion, is up to the users. Therefore, SDTI enables the most varied types of compressed video data, such as MPEG and DV-compressed video data to be distributed in existing digital video networks, at high transfer speeds. In future, SDTI is to enable the distribution of both compressed and uncompressed data streams in one and the same network. The relevant end device recognizes by the signal whether it contains uncompressed or compressed picture data and whether it can process these data.

SDTI-CP _ *Serial Digital Transport Interface - Contents Package* - A uniform "container" designed for streaming pictures (still and moving), audio, data and metadata over networks. Developed for use on SDTI, the Contents Package can also be stored. Packets are handled identically, no matter what they contain, enabling one network to carry any type of content.

SDTV _ *Standard Definition Television* - A digital television system in which the quality is approximately equivalent to that of analogue 525/60 and 625/50 NTSC and PAL systems. SDTV may have either 43 or 169 aspect ratios, and surround sound. Most digital broadcasts these days are SDTV

Search Engine _ An online service that takes the strain out of surfing by allowing you to enter key words into a box and then activate a search for any Web sites that contains those key words. A list duly appears from which you can narrow down your search or enter more specific key words to locate exactly what you want. The Web pages presented to you will all have the key words you entered embedded into their (hidden) html code.

SECAM _ *Sequential couleur avec mémoire* - Translated as "sequential color with memory". A composite color transmission system that potentially eliminates a need for both a color and hue control on the monitor. One of the color difference signals is transmitted on one line and the second is transmitted on the second line. Memory is required to obtain both color difference signals for color decoding. This system is used in France, Africa, Asia, Russia, Saudi Arabia and many Eastern European countries. It is similar to PAL, but produces color signals in a different manner. SECAM uses 625 horizontal scan lines, 50 fields per second (625/50). Also, an acronym for *Something Essentially Contrary to the American Method*.

Second System Syndrome _ The failure of a second system coined in "The Mythical Man Month" by Fred Brooks. It refers to a condition that occurs after a first system has been implemented. When it seems to be working well, designers turn their attention to a more elaborate second system, which is often bloated and grandiose and fails due to its over-ambitious design. In the meantime, the first system may also fail because it was abandoned and not continually refined.

Sector _ a) A 512-byte packet of data in EIDE and SCSI hard drives. This is the smallest amount of data that can be read or written to the drive from the host interface. On Macintosh and UNIX drives, sectors are usually grouped into blocks or logical blocks that function as the smallest data unit permitted. Since these blocks are often defined as a single sector, the terms block and sector are sometimes used interchangeably in this context. _ **b)** The smallest recordable unit on a CD. A CD can contain [(75 sectors per second) x (60 seconds per minute) x (number of minutes on a CD)] sectors. The amount of data contained in the sector depends on what physical format it is recorded in; for "regular" CD-ROM data, you can fit 2048 bytes (2 kilobytes) of data into a sector.

Sector Slipping _ A technique used to push-down defective sector sites during a format or reassignment operation to maintain sequential order of the data. Spares are located throughout the disk for this purpose.

Security Certificate _ A piece of data sent from one computer to another (when online) to prove the authenticity (or security) of the information about to be received or transferred via the Internet.

Security Scan _ A test of a network's vulnerabilities. A security scan does not attempt to break into the network illegally, rather it tries to find areas of vulnerability. A security scan uses a variety of automated software tools, typically performing hundreds of routine tests and checks. Security experts recommend that a security scan be undertaken at least quarterly.

Seek Time _ The time taken for the read/write heads of a disk drive to be positioned over a required track. Average seek time is the time to reach any track from the centre track. Maximum positioning time is the time to reach any track from any track. These times are critical to disk performance, especially when operating with the very high data rates associated with video.

Sega Master System _ This was the first 8 bit console from Sega, launched in 1986. It sold over 11 million units since then but has now been superseded by three generations of console technology. It is no longer marketed or sold at retail level.

Self-clocking _ Recording of digital data on a magnetic medium such that the clock pulses are intrinsically part of the recorded signal.

Self-extracting Archive _ An archived file with the filename extension .exe which indicates that when downloaded and run it will be extracted by the decompressing program around it without any need for you to interfere.

Semantic Processor _ Software that can extract knowledge (relevance, meaning, etc.) from text.

Semiconductor _ is a solid-state substance with conductive properties that can be altered with electricity. Silicon performs as a semiconductor when chemically combined with other elements. A semiconductor is also halfway between a conductor and an insulator. When charged with electricity or light, semiconductors change their state from nonconductive to conductive or vice versa. The most significant product built from a semiconductor is the transistor.

Sequence _ A coded video sequence that commences with a sequence header and is followed by one or more groups of pictures and is ended by a sequence end code.

Sequencer _ Software or, less commonly, a hardware device that can record, edit and playback a sequence of audio data. Modern sequencers use MIDI as their communications protocol.

Sequencing _ Repeated compression and decompression of digital material in successive processing steps and/or signal conversion of this material are referred to as sequencing. The problem of sequencing different digital compression and signal conversion steps is the fact that these calculation operations may lead to rounding errors which manifest themselves as image distortions.

Sequential Access _ The reading or writing of data in a sequential order as opposed to random access.

Sequential Erase _ Available with CD-RW CDs. Erasing the entire CD so that it can be re-used.

Serial _ One bit at a time, along a single transmission path. A data transfer method used to connect a peripheral, such as a digital camera, to a computer. The serial connection will allow the peripheral to transfer data to the computer and vise versa.

Serial ATA _ Proposed hard drive interface standard to be introduced with a data transfer rate of 150 MB/s.

Serial Bus _ A shared channel that transmits data one bit after the other over a single wire or fiber; for example, Ethernet uses a serial bus architecture. The I/O bus from the CPU to the peripherals is a parallel bus (16, 32 or 64 wires, etc.) Although sounding similar, a serial bus differs from a serial port. Both use serial transmission; however, the serial port connects the computer to one device, whereas a serial bus allows for the connection of multiple devices.

Serial Control _ A method of remotely controlling a device via a data line. The control data is transmitted in serial form, such as for RS-232 and RS-422 connections.

Serial Digital _ Digital information that is transmitted in serial form. Often used informally to refer to serial digital television signals.

Serial Digital Data Interface (SDDI) _ A way of compressing digital video for use on SDI-based equipment proposed by Sony. Now incorporated into Serial digital transport interface.

Serial digital interface (SDI) _ The standard based on a 270 Mbps transfer rate. This is a 10-bit, scrambled, polarity independent interface, with common scrambling for both component ITU-R 601 and composite digital video and four channels of (embedded) digital audio. Most new broadcast digital equipment includes SDI which greatly simplifies its installation and signal distribution. It uses the standard 75 ohm BNC connector and coax cable as is commonly used for analog video, and can transmit the signal over 600 feet (200 meters) depending on cable type.

Serial digital transport interface (SDTI) _ SMPTE 305M. Allows faster-than-realtime transfers between various servers and between acquisition tapes, disk-based editing systems and servers, with both 270 Mb and 360 Mb are supported. With typical realtime compressed video transfer rates in the 18 Mbps to 25 Mbps to 50 Mbps range, SDTI's 200+ Mbps payload can accommodate transfers up to four times normal speed. The SMPTE 305M standard describes the assembly and disassembly of a stream of 10-bit data words that conform to SDI rules. Payload data words can be up to 9 bits. The 10th bit is a complement of the 9th to prevent illegal SDI values from occurring. The basic payload is inserted between SAV and EAV although an appendix permits additional data in the SDI ancillary data space as well. A header immediately after EAV provides a series of flags and data IDs to indicate what's coming as well as line counts and CRCs to check data continuity.

Serial Port _ A port, or interface, that can be used for serial communication, in which only 1 bit is transmitted at a time. Most serial ports on personal computers conform to the RS-232C or RS-422 standards. A serial port is a general-purpose interface that can be used for almost any type of device, including modems, mice, and printers. Serial ports usually are the slowest ports on a PC, however all desktop and most laptop PCs have at least one serial port.

Serial Storage Architecture (SSA) _ A high speed data interface developed by IBM and used to connect numbers of storage devices (disks) with systems. Three technology generations are planned 20 Mbps and 40 Mbps are now available, and 100 Mbps is expected to follow.

Serial Video Processing _ A video mixing architecture where a series of video multipliers, each combining two video signals, is cascaded or arranged in a serial fashion. The output of one multiplier feeds the input of the next, and so on, permitting effects to be built up, one on top of the other.

Serializer _ A device that converts parallel digital information to serial.

Server _ **a)** A computer used primarily to store data, providing access to shared resources. Usually contains a network Operating System. _ **b) - file** A storage system that provides data files to all connected users of a local network. Typically the file server is a computer with large disk storage which is able to record or send files as requested by the other connected (client) computers - the file server often appearing as another disk on their systems. The data files are typically around a few kB in size and are expected to be delivered within moments of request. _ **c) - video** A storage system that provides audio and video storage for a network of clients. While there are some analogue systems based on optical disks, those used in professional and broadcast applications are based on digital disk storage. Aside from those used for video on demand (VO_ D), video servers are applied in three areas of television operation transmission, post production and news. Compared to general-purpose file servers, video servers must handle far more data, files are larger and must be continuously delivered. There is no general specification for video servers and so the performance between models varies greatly according to storage capacity, number of real-time video channels, compression ratio and speed of access to stored material - the latter having a profound influence. Store sizes are very large, typically from about 500 GB to a few terabytes. Operation depends on connected devices edit suites, automation systems, secondary servers, etc so the effectiveness of the server's remote control and video networking is vital to success.

Server Appliance _ A self-contained computer system specialized for network use. Its applications are pre-installed, and access to setup and configuration is via a Web browser. Server appliances may provide a single application or several applications; for example, a single device may provide file server, Web server, mail server and firewall capabilities. Server appliances are designed to be plugged into the network and configured, loaded with files and begin working immediately with limited or no technical support, at least for a power user or experienced network administrator. The appliance may also include a RAID-based disk system and redundant power supplies to provide an increased level of fault tolerance.

Server Farm _ A group of network servers that are housed in one location. A server farm provides bulk computing for specific applications such as Web site hosting, whereas while a datacenter has many servers, it also has people. In a server farm, you would generally only see a person when an installation or repair was performed, while in the datacenter, operators would be sitting at consoles, putting paper in printers and possibly moving disks and tapes from one place to another. A server farm is typically a room with dozens, hundreds or even thousands of rack-mounted servers humming away. They might all run the same operating system and applications and use load balancing to distribute the workload between them.

Server-based Computing _ Refers to storing applications in a server. The term has two meanings depending on whether the applications are also run in the server. If the applications are only stored in the server, it refers to the network computer architecture. If the applications are run in the server, it refers to the centralized, timeshared architecture of the mainframe.

Service Provider _ A company or organization (often referred to as the ISP) that provides its users with access to the Internet.

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

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

SET _ *Secure Electronic Transaction* - A standard protocol from credit card companies for securing online credit card payments via the Internet. It is a three-way transaction: the user, merchant and bank must use the SET protocols. Credit card data and a digital certificate (for authentication) is stored in a plug-in to the user's Web browser. The order is received by a SET-enabled merchant server that passes encrypted payment information to the bank. Approval is electronically sent to the merchant.

SETI _ *Search for ExtraTerrestrial Intelligence* - A huge peer-to-peer computing project on the Internet that takes advantage of unused processing time in users" computers to analyze radio telescope data. The purpose of SETI@home, which is administered by the University of California at Berkeley, is to pick up communications from other planets. Anyone can participate by downloading a screen saver that converts idle time into computations. Data is saved every couple of minutes and sent back to the SETI Web site at periodic intervals. Initiated in mid 1999, by the end of 2003, more than a billion results from more than four million users had been received.

Setting _ a settings file is one which records all your preferences for a particular program. Some settings files are easily replaced, e.g. your preferences for your word-processing program perhaps, but the settings for all your Internet connection software, (Address Book, your browser Bookmarks/Favorites) the way everything has to be set up in order to work, cannot be easily replaced.

Set-top Box (STB) _ These receivers (named because they typically sit on top of a television set) convert and display broadcasts from one frequency or type - analog cable, digital cable, or digital television) to a standard frequency for display on a standard analog television set.

Setup _ computer systems are not born, they are assembled. Although many things are standard (you don't have to assemble them from tiny bits when you buy them), you do need to decide what you want your computer to do, and then learn how to keep it "set up" and ready to go.

Set-up Engine _ A set-up engine allows drivers to pass polygons to the rendering engine in the form of raw vertex information, subpixel polygon addresses. Whereas, most common designs force the host CPU to pre-process polygons for the rendering engine in terms of delta values for edges, color, and texture. Thus, a set-up engine moves processing from the host CPU to the graphics chip, reducing bus bandwidth requirements by 30% for small, randomly placed triangles and by proportionately more for larger polygons.

SGI _ A manufacturer of workstations and servers, founded in 1982 by Jim Clark. The company was founded as *Silicon Graphics*, Inc., but changed to its acronym in 1999. Optimized with its proprietary graphics technologies, SGI offers a line of Unix and Linux workstations and servers that are geared to high-performance computing and visualization. SGI shipped its first graphics terminal in 1983 and first workstation in 1984 and has always led the way in computer graphics. Its custom chips and subsystems perform the tedious processing necessary to display objects on screen. Running a flight simulator on an SGI workstation was always far more realistic than any video game. SGI computers are used in a variety of commercial, industrial and military applications.

SGML _ *Standard Generalized Markup Language* - An international standard for the definition of device-independent, system-independent methods of representing texts in electronic form. SGML emphasizes descriptive rather than procedural markup. While HTML is a markup language which deals primarily with the appearance of a document, SGML is a more complex system for describing structural divisions in a text (title page, chapter, scene, stanza), typographical elements (changing typefaces), and other textual features (grammatical structure, etc.). The

"tags" in SGML preserve the structure of a text, enable the user to constrain searches to particular structural features of the text and aid in the navigation and use of the text.

SGRAM _ *Synchronous Graphics Random Access Memory* is a type of memory that is optimized for graphics use. SGRAM is capable of running at much higher speeds than fast page or EDO DRAM. SGRAM is able to execute a small number of frequently executed operations, such as buffer clears, specific to graphics applications independently of the controller.

Shade_ The luminance (brightness) of an image. Depending on the system, it is possible globally or selectively.

Shading _ The process of interpolating color within the interior of a polygon or between the vertices of a line during rasterization.

Shading Model _ The algorithm used to create the intensity and color of the visible portions of a primitive.

Shadow _ The darkest area in an image, represented in a halftone as the largest dots.

Shannon Limit _ In 1948, C.E. Shannon's article "The Mathematical Theory of Communication" established Information Theory (IT) which allows determination of the theoretical limit of any channel's information-carrying capacity. IT made possible development of digital systems. Without IT, much of modern communications, including the Internet, would not exist.

Share _ A resource such as a file, folder or printer, that has been made sharable with other users on the network.

Shared Disk Array _ A disk subsystem that is connected to two or more computers typically via the SCSI interface. When disk subsystems are connected via Fibre Channel switches, they are called "storage area networks."

Shared Video Memory _ Using part of main memory for the video display. Shared memory is commonly used in PCs where the display circuitry is integrated onto the motherboard. The disadvantage of shared memory is that it is taking up memory that applications would use, and main memory is normally not as fast as specialized video memory on a stand-alone display adapter.

Shareware _ Software distributed freely but with certain conditions applying to it. Either the software is released on a trial basis and must be registered after a certain period of time, or in other cases no support can be offered with the software without registering it. In some rare cases, direct payment to the author of the shareware is required.

Sharpen _ A computer graphics process that enhances the contrast on the edges of light and dark shapes to make images appear more in focus.

Sharpness _ Control over the presentation of fine detail in a picture, independent of course picture content. At least that's what it is supposed to mean. It was originally introduced into color TV sets that used a notch filter decoders. That would be almost every color TV set on the market before the mid-1980"s. The filter took away all high frequency detail in the black and white portion of the picture. The sharpness control attempted to put some of that detail back in the picture.

Shielded Speaker _ Powerful magnets inside speakers can damage a television, so speakers placed near TVs (especially center channels) need to be shielded to prevent this problem.

Shift Register _ The area of the CCD, which receives the electronic information for processing and cataloging before passing it to the A to D converter.

Shockwave _ This is a small program that's used when building websites to enable moving graphics.

Shooters _ A dying breed of computer games that has recently experienced resurgence, the shooter is like an action game in that it asks the player to mindlessly pursue the destruction of wave after wave of enemy. In a traditional shooter, the player controls a flying vehicle of some kind rather than controlling a character on foot. More recent shooters involve mechs and characters toting guns from a third-person perspective. Shooters also feature numerous power-ups and elaborate bosses, not to mention some of the fastest action in gaming. Classic shooters include the R-Type and Gradius franchises.

Shortcuts _ a) In Windows, shortcuts are placeholders which refer to original files at another location. By opening the shortcut, the original file is opened and also modified, where applicable. _ **b)** Keyboard shortcuts are predefined key combinations which permit certain functions to be executed directly via the keyboard.

Shovelware _ A large amount of "extras" included on a CD-ROM that add little benefit to the user. Shovelware implies that a lot of freeware, shareware and/or public domain software was added to make it look like a great value. With seven times as much capacity, DVD-ROMs are expected to include even more shovelware than CD-ROMs.

SHQ, HQ, and SQ Quality Modes _ Digital still cameras offer a variety of quality modes for saving images to the cameras memory. SHQ; Super High Quality, HQ; High Quality, and SQ; Standard Quality. These modes vary among camera models and you should refer to the camera's owner's manual for exact information on sizes and use. To save files in these quality modes digital cameras may use TIFF, or JPEG file formats. JPEG offers a variety of different compressions, allowing the user to save more images or higher quality images. These Quality modes also allow the selection of various pixel resolutions of images from lower (e-mailable) pixel resolutions to the highest (print quality) pixel resolutions of the camera.

Shuttle _ a) The transferring of data from workstation to off line storage drives. **_ b)** To move smoothly, forward or backward, through video or audio media at a constant rate.

Side Converting _ The process which changes the number of pixels and/or frame rate and/or scanning format used to represent an image by interpolating existing pixels to create new ones at closer spacing or by removing pixels. Side converting is done from standard resolution to standard resolution and high definition to high definition.

Side Panels _ Image of a standard 4:3 picture on a widescreen 16:9 aspect ratio television screen, typically with black bars on the side. Used to maintain the original aspect ratio of the source material.

Side Plane _ The plane created by the y and z axes.

SIF _ *Standard (or Source) Input Format* This video format was developed to allow the storage and transmission of digital video. The 625/50 SIF format has a resolution of 352 x 288 active pixels and a refresh rate of 25 frames per second. The 525/60 SIF format has a resolution of 352 x 240 active pixels and a refresh rate of 30 frames per second. Note that MPEG-1 allows resolutions up to 4095 x 4095 active pixels; however, there is a

"constrained subset" of parameters defined as SIF. The computer industry, which uses square pixels, has defined SIF to be 320 x 240 active pixels, with a refresh rate of whatever the computer is capable of supporting.

Signal _ When you send an email, for example, it is delivered via a signal in a bundle of information containing your message that travels over the phone lines. A television signal on the other hand, is data that is transmitted over the airwaves which tells your television what colors to show and which sounds to produce.

Signal Loss _ A video problem that shows up as a faint picture for lack of video information.

Signal Preparation _ The analogue to digital converter (AD_ C) only operates correctly if the signals applied to it are correctly conditioned. There are two major elements to this. The first involves an amplifier to ensure the correct voltage range and amplitude for the signal is given to the ADC. For the second major element the signals must be low-pass filtered to prevent the passage of information beyond the 5.75 MHz luminance band limit and 2.75 MHz color difference band limit, from reaching their respective ADCs.

Signal to Noise Ratio _ *S/N ratio* - The ratio, measured in decibels, between the audio or video signal and the noise accompanying the signal. The higher the S/N ratio, the better the quality of the sound or picture.

Signaling Rate _ The bandwidth of a digital transmission system expressed in terms of the maximum number of bits that can be transported over a given period of time. The signaling rate is typically much higher than the average data transfer rate for the system due to software overhead for network control, packet overhead, etc.

Signature _ Not the one you provide when you sign a cheque, but the automatic addition of a few lines at the foot of an E-mail message. These usually consist of the sender's E-mail address, their name and/or other details. A signature can also contain a reference to a web site address.

Silhouetting _ A two-dimensional representation of the outline of an image or element. Also to outline and fill in with black, or display against a lighter back ground. A form of masking.

Siliwood _ *Silicon Hollywood* - A digital convergence term (computers, DVDs, MSN TV, etc.).

Simple Profile _ MPEG image streams using only I and P frames is less efficient than coding with B frames. This profile, however, requires less buffer memory for decoding.

Simputer _ *Simple computer* - A handheld computer designed by Indian scientists and engineers from Encore Software Ltd. (www.ncoretech.com) and the Institute of Science, Bangalore, India. Based on the StrongARM CPU and Linux, it uses graphics and voice output to appeal to users in third-world countries with limited literacy. It also contains a smart card reader for financial transactions and a browser that renders content in the XML-based Information Markup Language (IML), which was designed for devices like the Simputer.

Simulation _ **a)** The mathematical representation of the interaction of real-world objects. _ **b)** The execution of a machine language program designed to run in a foreign computer. _ **c)** A game that tries to accurately recreate a particular situation in the real world. This can be done on a small scale, such as a flight or tank simulation, or on a large scale, such as managing a hospital, amusement park, or an entire city. In the latter cases, of course, most of the realism is lost in favor of retaining the fun of the game.

Simulcast _ To broadcast the same program over two different transmission systems. Some AM and FM stations simulcast the same program for part of the day, and some radio stations simulcast the audio from televised music events. Although not initially required, it is believed that most television stations will simulcast their DTV and SDTV signal. Both versions are transmitted frame accurately at the same time to ensure that no viewer is disadvantaged. Simulcasting will be required towards the end of the DTV transition period to protect the public interest.

Simultaneous True Random Access _ Describes access on a video server where each port supplying continuous real-time video can access any sequence of stored frames regardless of the demands of other ports. This implies there is no copying of material to achieve this. Such access makes control of video servers much more straightforward, and allows many independent operations to take place at the same time.

Sine Wave _ The most basic waveform, a pure tone with no harmonics, consisting of a single partial. Forms the basis of all complex, periodic sounds.

Single Board Computer _ A printed circuit board that contains a complete computer, including processor, memory, I/O and clock.

Single Chip _ Refers to one integrated circuit (one chip) rather than two or more. As you trace the evolution of all electronic devices (computers, calculators, phones, etc.), more circuits are combined onto one chip with every passing year. What might take 10 chips today will be reduced to a single chip three to five years from now. This continual reduction in the number of required semiconductor devices has enabled all variety of handhelds and miniature devices to be created.

Skin _ A custom GUI (graphical user interface) designed for a specific piece of software.). For example, Windows enables developers to create an entirely different look for the window frames, scroll bars, buttons and elements on the Windows interface.

SKU _ *Shop Keeping Unit* - Industry term that helps differentiate one game title into its different incarnations on several platforms.

SkyView _ A graphic overview of the program in the time line. Visually relates the current view of the time line to the complete program.

Slant _ To incline an object, either horizontally, vertically, or both.

Slave _ A computer or peripheral device controlled by another computer. For example, a terminal or printer in a remote location that only receives data is a slave. When two computers are hooked up via their serial or parallel ports for file exchange, the file transfer program may make one computer the master and the other the slave.

Sleep Timer _ Each touch of a button on the remote will add 15-minutes to the length of time until the TV turns off, up to 3 hours total.

Slice _ A series of macroblocks. A slice is the basic synchronizing unit for reconstruction of the image data and typically consists of all the blocks in one horizontal picture interval - typically 16 lines of the picture.

Sliced VBI Data _ A technique where a **VBI** decoder samples the VBI data (such as teletext and captioning data), locks to the timing information, and converts it to binary 0"s and 1"s. DC offsets, amplitude variations, and ghosting must be compensated for by the VBI decoder to accurately recover the data.

Slide _ A editing feature that adjusts the Out point of the previous clip, and the In point of the next clip without affecting the clip being slid or the program duration.

SLIP _ **a)** *Serial Line Internet Protocol* - This allows an operator to use a modem and phone line to connect to the Internet - without the need to be connected to a host computer. _ **b)** An editing feature that adjusts the In and Out points of a clip without affecting the adjacent clips or affecting overall program duration.

Slow Sync _ A special mode in digicams that opens the shutter for a longer than normal period and fires the flash just before it closes. Used for illuminating a foreground subject yet allowing a darker background to also be rendered. Good for night time shots of buildings with people in the foreground.

SMART _ *Self-Monitoring, Analysis, and Reporting Technology* - S.M.A.R.T. enables a drive's internal status to be monitored through diagnostic commands at the host level and during off-line activities.

Smart Car _ An automobile with advanced electronics. Microprocessors have been used in car engines since the late 1960s and have steadily increased in usage throughout the engine and drive train to improve stability, braking and general comfort. The 1990s added information-oriented enhancements such as GPS navigation, reverse sensing systems and night vision (able to visualize animals and people beyond normal human range). The 2000s are adding Web and e-mail access, voice control, smart card activation instead of keys and systems that keep the vehicle a safe distance from cars and objects in its path.

Smart Card _ Plastic card that uses a silicon chip as its storage mechanism, instead of the conventional magnetic strip, for increased security and functionality. When inserted into a reader, it transfers data to and from a central computer. It is more secure than a magnetic stripe card and can be programmed to self-destruct if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used like a travelers check, except that variable amounts of money can be spent until the balance is zero. When used in your DTV decoder, it monitors what you have subscribed to and stops you viewing channels you are not entitled to watch.

Smart Display _ A flat panel touch screen that has a wireless connection to a Windows XP computer so it can be used in any room in the home or office. Introduced in early 2003 and originally code named "Mira," meaning "look" in Spanish, Smart Display uses the 802.11 wireless technology.

Smart Dust _ Miniaturized sensor/transmitters that are sprinkled onto an area such as a battlefield and used to analyze the environment. Developed by Professor Kris Pister at the University of California at Berkeley and expected in the next decade, smart dust particles are planned to be no more than 1 cubic millimeter in size, which includes a solar cell, a sensor, CPU, memory and radio transmitter.

Smart House _ A home that is highly automated. It uses a common network infrastructure for lights, appliances and other devices.

Smart Phone _ A telephone with advanced information access features. Emerging in the late 1990s, a smart phone is typically a cellular telephone that provides digital voice service as well as any combination of e-mail, text messaging, pager, Web access, voice recognition as well as picture taking. Organizer functions in a PDA may also be integrated.

SmartIcons _ Innovative one-click shortcuts commands that automatically complete a function.

SmartMedia _ An ultra-compact flash memory format developed by Toshiba. About the size of CompactFlash, but as thin as a credit card, SmartMedia cards are popular storage for digital cameras with capacities up to 128MB. Available in 3.3 and 5 volt variations, SmartMedia cards require no assembly in manufacture as they are actually flash memory chips in a unique chip package. The cards can be plugged into a SmartMedia socket or into a standard Type II PC Card slot with a PC Card adapter.

SmartPhone _ A cellphone platform from Microsoft that plays multimedia files and integrates with Outlook to retrieve wireless e-mails. Starting in 2003, Motorola and Samsung were the first cellphone makers to offer phones with the Microsoft technology.

SmartRender _ SmartRender technology renders only project changes, eliminating the need to re-render whole projects and enabling fast previewing.

SMIL _ *Synchronized Multimedia Integration Language* - Like HTML, it is a markup language designed to be easy to learn and deploy on Web sites. SMIL was created specifically to solve the problems of coordinating the display of a variety of multimedia on Web sites. By using a single timeline for all of the media on a page, display can be time-coordinated and synchronized.

Smileys _ These are the special keyboard characters often used in news messages, on E-mails or on Web pages to suggest to the recipient that you are expressing a degree of emotion. I'm happy is :-) and I'm sad is :-(and so on.

Smooth _ To blur or defocus color or an element.

Smoothing _ Averaging pixels with their neighbors. It reduces contrast and simulates an out-of-focus image. Also known as antialiasing

SMPTE _ *Society of Motion Picture and Television Engineers* - A United States organization, with international branches, which includes representatives of the broadcasters, the manufacturers and individuals working in the film and television industry. The SMPTE maintains a series of committees dealing with standards and standardization proposals. Established the standards for time code and for all the major video tape formats.

SMPTE Time Code _ a timing standard adopted by the Society of Motion Picture and Television Engineers for controlling different audio and video devices, containing synchronizing data, hour, minute, second, frame data and 8 groups of users bits.

SMTP _ *Simple Mail Transport Protocol* Often referred to as sendmail, it's designed to allow the delivery of mail messages to all types of Internet users. E-mail is usually received by ISP's as SMTP and then it's forwarded into a POP3 mailbox ready for you to collect it next time you go online.

Snail Mail _ Write a letter to a friend, go to the post office and buy a stamp, stick it on the letter and then walk to the postbox to send it, wait a couple of days (or more if it's second class) for it to get to its destination and then wait another two days or more for a reply! Got the message? Now you know why it's called Snail Mail. Believe it or nit, some people still prefer it over the e-mail!

SND file _ *Sound file* - One of several digital audio file formats that were created by Apple, NeXT and others. It typically refers to an un-compressed sound file used on the Macintosh. SND files use the .SND extension. In the Mac, digitized sounds can be stored as SND and AIFF files, or as resources in the resource fork.

Sneakernet _ Carrying floppy disks, Zip disks, CD-Rs or some other removable recording medium from one machine to another to exchange information when there is no network in place.

Snow _ a) Random noise on a display screen often the result of dirty videotape heads. **_ b)** TV signal breakup caused by poor reception.

Socket 370 _ The motherboard receptacle for Pentium CPUs that is more economical than the elaborate Slot 1 system introduced with the Pentium II. Socket 370 accepts a 370-pin PPGA (plastic pin grid array) chip package, instead of the SEC (single edge cartridge) Slot 1 package. Socket 370 chips and motherboards cost less to manufacture.

Socket 423 _ The motherboard receptacle for earlier model Pentium 4 chips that use the 423-pin PGA package.

Socket 478 _ The motherboard receptacle for later model Pentium 4 chips that use the 478-pin micro-PGA (µPGA) package.

Socket 603 _ The motherboard receptacle for certain model Xeon chips from Intel that use a 603-pin micro-PGA (µPGA) package.

Socket 604 _ The motherboard receptacle for certain model Xeon chips from Intel that use a 604-pin micro-FCPGA (µFCPGA) package.

Socket 7 _ The motherboard receptacle that holds a Pentium CPU chip. It is also used to hold Pentium-compatible chips such as Aid's K5 and K6 CPUs.

Socket 8 _ The motherboard receptacle that holds a Pentium Pro CPU chip.

Socket A _ The motherboard receptacle for Duron and newer Athlon CPU chips from AMD. It uses a 462-pin PGA package.

Soft _ Flexible and changeable. Software can be reprogrammed for different results. The computer's soft nature is its greatest virtue; however, the reason it takes so long to get new systems developed has little to do with the concept. It is based on how systems are developed (file systems vs. database management), the programming languages used (assembly vs. high-level), combined with the skill level of the technical staff, compounded by the organization's bureaucracy.

Soft Error _ An error that does not repeat when the same location is reread. Can be corrected by the error recovery process.

Soft RAID _ A RAID system implemented by low level software in the host system instead of a dedicated RAID controller. While saving on hardware, operation consumes some of the host's power.

Soft Wipe _ A split screen or wipe effect with a soft border or edge where the two images join.

Soft-edge Masking _ An image processing function which increases the apparent sharpness of an image.

Software _ The programs used to instruct a processor and its peripheral equipment to perform prescribed operations. Software has to be written for a specific computer Operating System (OS). The two major categories of software are "system software" and "application software." System software is made up of control programs such as the operating system and database management system (DBMS). Application software is any program that processes data for the user (inventory, payroll, spreadsheet, word processor, etc.). A common misconception is that software is data. It is not. Software tells the hardware how to process the data. Software is "*run*." Data are "*processed*."

Software Architecture _ The design of application or system software that incorporates protocols and interfaces for interacting with other programs and for future flexibility and expandability. A self-contained, stand-alone program would have program logic, but not a software architecture.

Software Bug _ A problem that causes a program to produce invalid output or to crash (lock up). The problem is either insufficient logic or erroneous logic. For example, a program can crash if there are not enough validity checks performed on the input or on the calculations themselves, and the computer attempts to divide by zero. Bad instruction logic misdirects the computer to a place in the program where an instruction does not exist, and it crashes. A program with bad logic may produce bad output without crashing, which is the reason extensive testing is required. For example, if the program is supposed to add an amount, but subtracts it instead, bad output results, although the computer keeps running.

Software Codec _ A compression/ decompression routine that is implemented in soft-

ware only without requiring specialized DSP hardware.

Software Conflict _ A problem that occurs when two programs cannot run in the same computer at the same time. It is generally due to a programming bug and typically manifests when two programs compete for the same resource (memory, peripheral device, register, etc.). Not often, but possible, intermittent hardware failures can cause two programs to conflict. The bug in the code could be in the application program or the OS, DBMS or other system program that carries out the functions of the programming interface (API). If the interface is poorly defined, two applications may request services that cause conflict. This is more a bug in architecture rather than improper coding by the application programmers. Software conflicts can be one of the most vexing problems to solve.

Software Effect _ An effect that must be rendered by an editing application before it can be played back. Contrast with real-time.

Software Rendering _ Performing the computations necessary to construct output for the printer or screen by following instructions in a program routine.

SoHo _ *Small office/Home office* (users)

Solarization _ A special effect to make color changes by reducing the number of available colors from 16 million to 10-100 in discrete steps.

Solid Modeling _ A mathematical technique for representing solid objects. Unlike wireframe and surface modeling, solid modeling systems ensure that all surfaces meet properly and that the object is geometrically correct. Solid models allow for interference checking, which tests to see if two or more objects occupy the same space. Solid modeling is the most complicated of the CAD technologies, because it simulates an object internally and externally. Solid models can be sectioned (cut open) to reveal their internal features, and they can be stress tested as if they were physical entities in the real world.

Solid State _ A generic term given to integrated circuits and other electronic systems containing no moving parts for their prime function. For data storage, solid state devices are much faster and more reliable than mechanical disks and tapes, but are more expensive. Although solid state costs continually drop, disks, tapes and optical disks also continue to improve their cost/performance ratio.

Solid State Disk _ A disk drive made of memory chips used for high-speed data access or in hostile environments. Solid state disks are used in battery-powered, handheld devices as well as in desktop units with hundreds of megabytes of storage that contain their own UPS systems.

Solid State Recorders _ Recording devices storing data entirely on integrated circuits, normally DRAMs. Used with video, these can offer random access to any stored frame but the relatively high cost for the large storage areas required has, so far, limited store size.

Solitaire _ A CRT film recorder line manufactured by Management Graphics, Inc., Minneapolis, MN.

Sonet _ *Synchronous optical network* - A set of standards for the digital transmission of information over fiber optics. Based on increments of 51 Mbps. It was developed to cost effectively support broadband services and multi-vendor internetworking.

SONY _ Humorous abbreviation for *Soon, Only Not Yet.*,

Sound Bandwidth _ A range of sound frequencies. The human ear can perceive approximately from 20 to 20,000Hz, but human voice is confined to within 3,000Hz.

Sound Card _ This is an expansion card that is usually plugged into the motherboard of the computer thus enabling game sound effects and music etc to be played when required. All modern computers are supplied with a basic sound card installed which can be upgraded if necessary.

Sound Digitizer _ A device that records sounds and stores them as computer files.

Sound Stage _ A listening term, refers to the placement of a stereo image in a fashion that replicates the original performance. A realistic sound stage has proportional width, depth and height. Models with a broad sound stage produce spacious, dramatic sound.

Sound-pressure Level (spl) _ A measure of acoustic wave force. The force that sound can exert against an object; our ear drums as an example. It is measured in dB's and is "0" referenced to 1 dyne per square centimeter.

Source _ The source or origin of your media, usually a camcorder or VCR. Audio CDs are great sources for music clips.

Source Clip _ A clip that refers directly to physical media.

Source Code _ The high-level language version of a program in e.g. C or Pascal, understandable without great difficulty by the human mind. Source code is the input to the compiler to produce object code

Spam _ The slang for junk E-Mail. Also known as "unsolicited commercial e-mail" (UCE), "unsolicited bulk e-mail" (UBE), "gray mail" and just plain "junk mail," the term is both a noun (the e-mail message) and a verb (to send it). Spam is used to advertise products or to broadcast some political or social commentary. Like viruses, spam has become a scourge on the Internet as hundreds of millions of unwanted messages are transmitted daily to almost every e-mail recipient as well as to newsgroups. Unfortunately for users and fortunately for spammers, as an advertising medium, spam does produce results. Even if only an infinitesimal number of users reply, it is still cost effective since e-mail is a very inexpensive way to reach people.

Span _ In raster graphics architecture a primitive is formed by scan conversion where each scan line intersects the primitive at two ends, P left and P right. A contiguous sequence of pixels on the scan line between P left and P right is called a Span. Each pixel within the span contains the z, R, G, and B data values.

Spatial Compression _ A compression method that reduces the data contained within a single video frame by identifying areas of similar color and eliminating the redundancy.

Spatial Resolution — Spatial resolution is a measurement of the total number of pixels displayed in an entire image, usually noted in terms of horizontal by vertical (640 x 480).

SPDIF _ *Sony/Philips Digital Interface* - This is a consumer interface used to transfer digital audio. A serial, self-clocking scheme is used, based on a coax or fiber interconnect. The audio samples may be 16-24 bits each. 16 different sampling rates are supported, with 32, 44.1, and 48 kHz being the most common.

Speed _ **a)** The playback rate of a video or audio clip compared to the rate at which it was recorded. _ **b)** Speed, Frame Rate and Rate are synonymous. Time code speed is counted in frames-per-second (fps). SMPTE time code has two speeds 30 fps and 29.97 fps. EBU time code is 25 fps. Film time code is 24 fps.

SPG _ *Sync Pulse Generator* - An electronic device which generates reference sync pulses or color black.

SPIFF _ *Still Picture Interchange File Format*; proposed by the ISO as a standard file format for the transfer of still images.

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

Splice _ The physical act of cutting a medium, such as film or audio tape, to add new tape to it or take out portions of it. In computer editing, it describes the same function, but not the same physical process.

Spline _ An equation computed by the system that defines the acceleration and deceleration aspects of the image as they change from one keyframe to another.

Spline-based Modeling _ Representing 3D objects as surfaces made up of splines.

Split Edit _ A technique resulting in a clip's video and audio beginning or ending at different times.

Split Screen _ Split screen refers to a mode exclusive to multiplayer games wherein all players play on the same screen. It splits the screen evenly among the number of players currently playing the game. Split-screen mode is notorious for making a game more difficult, as it reduces the visible area of the game and sometimes warps the players" surroundings. You can usually split the screen horizontally or vertically, depending on your preference.

Split Sync Scrambling _ Split sync is a video scrambling technique, usually used with either horizontal blanking inversion, active video inversion, or both.

Splitter _ This is a program that is able to split one big movie into smaller files, which should later be combined again if you wish to see it without changing files again.

Spooler _ A means of placing multiple jobs in a queue to send to an output device in quick succession. The system will then batch process and output them sequentially.

Spooling _ Temporarily storing information onto a hard drive (or even a remote drive) to return the control of a program to the user. It is often used in the background to feed data to a printer while the user continues to work.

Sport Video Games _ As the name implies, a sports game re-creates the rules and playing conditions of a real sport inside a video game world. Nearly every sport popular in the United States, Japan, or Europe has had several games devoted to it; among the sports are football, soccer, baseball, and track and field. Diverse sports such as snowboarding and skateboarding and, much to many players" chagrin, deer hunting have recently been represented. Some popular sports games include the Madden series of football games and Tony Hawk's Pro Skater.

SPP _ *Song Position Pointer* - a system-common message that specifies where in a sequencer a device should begin to play.

Spray Brush _ Interactive deposit of specific color over certain areas of a picture, i.e. airbrushing.

Spreadsheet _ A software application which is capable of creating sheets of figures or data and applying calculations to them automatically as and when new data is added to the individual fields. The most popular of these is currently Microsoft Excel which is part of the MS Office Suite of applications.

Sprites _ a) In MPEG-4, static background scenes. Sprites can have dimensions much larger than what will be seen in any single frame. A coordinate system is provided to position objects in relation to each other and the sprites. MPEG- 4's scene description capabilities are built on concepts used previously by the Internet community's Virtual Reality Modeling Language (VRML). _ **b)** A flat 2D object in a video game. A sprite can be a single frame of animation, or it can contain hundreds of frames. Sprites can be manipulated onscreen to perform any function, such as representing a character or power-up.

Spyware _ Software that sends information about your Web surfing habits to its Web site. Often quickly installed in your computer in combination with a free download you purposefully selected from the Web, spyware, also known as "parasite software," transmits information in the background as you move around the Web. The license agreement that most everyone accepts without reading may clearly indicate what the software does, or it

may not. It may state that the program performs anonymous profiling, which means that your habits are being recorded, but not you individually. Such software is used to create marketing profiles; for example, people who like Web sites that feature product "A" often go to Web sites that feature product "B" and so on. Spyware can be clever enough to deliver competing products in real-time. For example, if you go to a Web page and look for a minivan, an ad for a competitor's minivan might pop up. Very prestigious merchants place ads with spyware advertisers, because they feel their promotions are more targeted. In fact, many feel that the Internet has opened up the most intelligent customer targeting system the world has ever seen. Merchants say that rather than overload everyone with spam, they are targeting prospects who are really interested in the kinds of products they sell. Spyware organizations argue that as long as they are not recording names and personal data, but treat the user as a numbered individual who has certain preferences, they are not violating a person's right to privacy. Nevertheless, many users feel that their privacy has been violated, and some become quite annoyed. The bottom line is that once you detect a spyware program in your computer, it can be eliminated, albeit sometimes with much difficulty. The downside is that people become suspect of every piece of software they install, and some even go so far as to "read the dreaded software license.

Square Pixels _ A "square pixel" is one that has the same number of active samples both horizontally and vertically, for a 1:1 aspect ratio. Computers and HDTV use square pixels. Using 480 active scan lines for NTSC, if the display had a 1:1 aspect ratio, square pixels would mean there would be 480 active samples per line. Since the display has a 4:3 aspect ratio, the number of active samples is (480)*(4/3) or 640. To get 640 active samples per line, you need a 12.27 MHz sample clock. Using 576 active scan lines for PAL, if the display had a 1:1 aspect ratio, square pixels would mean there would be 576 active samples per line. Since the display has a 4:3 aspect ratio, the number of active samples is (576)*(4/3) or 768. To get 768 active samples per line, you need a 14.75 MHz sample clock.

Square Wave _ A symmetrical rectangular waveform. Square waves contain a series of odd harmonics.

SRAM _ *Static Random Access Memory*. This type of memory chip in general behaves like dynamic RAM (DRAM) except that static RAMs retain data in a six transistor cell needing only power to operate (DRAMs require clocks as well). Because of this, current available capacity is lower than DRAM - and costs are higher, but speed is also greater.

SRC _ *sample rate converter.*

SRS Surround Sound _ A dynamic audio playback system that simulates a three-dimensional sound field using only two speakers. This process works whether the signal is mono, stereo, or surround-encoded.

SSA _ *Serial Storage Architecture*, authoritative network architecture forged by Siemens and IBM. SSA makes it possible to network printers, scanners and magnetic storage media or even workstations, servers and PCs with a high-speed and efficient connection. SSA is based on loop architecture (circular networking) and can work with up to eight controllers (e.g. workstations) per loop.

SSFDC _ *Solid State Floppy Disk Card* Toshiba's removable flash RAM memory cards. Used to store portable digital camera files.

SSL _ A security system that allows information such as credit card details to be sent over the Net.

Stabilizer _ a) Simplified version of a time-base corrector . With simplified switchings, the stabilizer ensures that the video signals passing through it are freed from jitter and other instabilities, but does not offer the, at times, comprehensive functional range of a full TBC. **_ b)** In some compositing systems, motion information which was acquired with the help of a (multi) tracker can be used in order to stabilize distorted original recordings during postediting.

Standard Cells _ Pre-defined logic elements that may be selected and arranged to create a custom IC more easily than through original (custom) design

Standard MIDI file _ a standardized form of data used for exchanging MIDI files between programs.

Standard Platform _ A computer and operating system built for general purpose use. It cannot be used on its own but must be fitted with any, or many, of the very wide range of specific application software and additional hardware packages available. For example the same standard platform may be used for accounting, word processing and graphics

but each runs from a different software applications package and may need special hardware. The term has become somewhat confusing in that a standard platform can be anything from a PC to a super computer. Also some applications are mutually exclusive - when the computer's hardware is configured for one it has to be re-configured to run another. It is then arguable whether this is still a standard platform or has it metamorphosed into a dedicated system?

Standard-definition TV _ There are two main digital formats - HDTV and SDTV. SDTV typically produces better quality images than that of traditional analog TV. However, because SDTV signals occupy less space on the allocated spectrum than HDTV signals, SDTV can bring viewers multiple channels of programming from the same station even though its images are not nearly as sharp as the images from the ultimate form of Digital Television - High-definition TV. SDTV also incorporates stereo sound plus a wide range of data services. SDTV signals may be broadcast in 4:3 or 16:9 formats and may or may not include Dolby Digital audio.

Standards _ Standards is the most important issue in the computer field. As an unregulated industry, it has wound up with thousands of data formats and languages, but few standards that are universally used. This subject is as heated as politics and religion to vendors and industry planners. In order to truly understand this industry, it is essential to understand the categories for which standards are created. No matter how much the industry talks about compatibility, new formats and languages appear routinely. The standards makers are always trying to cast a standard in concrete, while the innovators are trying to create a new one. Even when standards are created, they are violated as soon as one vendor adds a proprietary extension. While many become bona fide standards endorsed by recognized standards organizations such as ANSI and the IEEE, some of the most widely used are de facto standards. Intel and Microsoft standards are the most obvious examples. While the Internet is helping immensely, it will by no means solve all issues. As we forge ahead with new technologies, there is some point where we can no longer cling to the old designs for compatibility. At that time, the new has to break from the past, as the previous infrastructure only holds us back. It's no different than constructing a new

building on top of a weak foundation. It seems to be the way of things.

Start Menu _ This is the Windows "pop-up menu" of options that appears every time you click on Start.

Static IP Address _ Every computer on the Internet is identified by a unique number called an IP Address. Every time you connect to the Internet your computer is assigned an IP Address. If yours is Static, you will get the same number every time you connect.

Static Media _ Refers to design elements that do not incorporate motion or sound such as still photos or graphics.

Statistical Multiplexing _ This increases the overall efficiency of a multi-channel digital television transmission multiplex (several TV channels carried within one data stream over a 6, 7 or 8 MHz broadcast channel) by varying the bit-rate of each of its channels to take only that share of the total multiplex bit-rate it needs at any one time. The share apportioned to each channel is predicted statistically with reference to its current and recent-past demands. For example, football - generally with much action and detail (grass and crowds) - could use a higher data rate than a chat show with close-ups and far less movement. The data streams for each program are monitored and their bit rates varied accordingly.

Status Bar _ This is the small narrow strip at the bottom of a window that displays information about that window's contents. Sometimes the Status Bar will show you the size of file being viewed and at other times it will show how many items have been selected. Status Bar information varies from computer to computer according to what type of system or application is running.

Status Byte _ the first byte of a MIDI message that specifies what type of message it is.

Stencil _ A key signal used in graphics systems. It can be drawn, derived from picture information, or both. It can be used to define the area of an object, obscure part or all of an object, may be transparent and control the application of paint... and more.

Step _ To move forward or backward one frame at a time.

Step Time _ Entering notes one by one, as opposed to real-time recording in a sequencer.

Stereo _ From the Greek meaning solid. The purpose of stereo is not to give you separate right and left channels but to provide the illusion of a three-dimensional, holographic image between the speakers.

Stereoscopic _ Where an image or scene is presented differently for each eye allowing a true 3D perspective. Some head-mounted displays offer stereoscopic vision to increase the effect of being in an artificially created environment.

Still _ In video, the term "still" is used as opposed to "motion" because there can be a difference in the way these two types of video are processed for the best viewing results, especially when the video is line-doubled or line-quadrupled. Still video includes text and slide presentations, while motion would include movies and TV programs.

Storage Capacity (for video) _ Using the 4:2:2 digital coding standard for SD, each picture occupies a large amount of storage space - especially when related to computer storage devices such as DRAM and disks. Storage capacities for SD video can all be worked out directly from the 601 standard. Bearing in mind that sync words and blanking can be re-generated and added at the output, only the active picture area need be stored. Every line of a 625/50 or 525/60 TV picture has 720 luminance (Y) samples and 360 each of two chrominance samples (Cr and Cb), making a total of 1,440 samples per line. In the **625-line standard** there are 576 active lines per picture, this giving 1440 x 576 = 829,440 pixels per picture. Sampled at 8 bits per pixel a picture is made up of 6,635,520 bits or 829,440 8-bit bytes - generally written as **830 kB.** With 25 pictures a second there are 830 x 25 = 20,750 Kbytes or **21 Mbytes per second.** The **525/60** picture has 487 active lines so there are 1,440 x 487 = 701,280 pixels per picture. With each pixel sampled at 8-bit resolution this creates 5,610,240 bits, or **701.3 Kbytes.** At 30 frames per second creates a total of 21,039 Kbytes, or **21 Mbytes per second.** Note that both 625 and 525 line systems require approximately the same amount of storage for a given time - 21 Mbytes for every second. To store **one hour takes 76 Gbytes.** Looked at another way each gigabyte (GB) of storage will hold 47 seconds of non-compressed video. If compression is used, simply divide or multiply the numbers by the compression ratio. For example, with 5:1 compression (DV) 1 GB will hold 47 x 5 = 235 seconds, and 1 hour takes 76/5 = 18 GB (approx).

Storage Device _ Here, storage device refers to many kinds of hardware used to save data. These all come with an amount of memory, which is available on either a portable disk, a hard-drive disk or digital tape.

Store and Forward _ The method by which authorized theatres receive the digitized programs and keep them in local storage while still encrypted and compressed. At each showing, the digitized information is retrieved from the local storage, decrypted with a set of separately delivered program keys, decompressed and displayed using state-of-the-art, cinema-quality digital high definition projectors.

Storyboard _ A storyboard is a visual representation of your movie. Individual clips are represented as image thumbnails on the timeline.

Streaming _ Sending live or on-demand video or audio broadcast over the Internet. Popular streaming video formats include RealVideo, QuickTime and WMV.

Streaming Audio _ A one-way sound transmission over a data network. It is widely used on the Web as well as private intranets to deliver audio on demand or an audio broadcast (Internet radio). Unlike sound files (WAV, MP3, etc.) that are played after they are downloaded, streaming audio is played within a few seconds of requesting it, and the data is not stored permanently in the computer. Listening to momentary blips in music or in a conversation is very annoying and the only way to compensate for that over an erratic network such as the Internet is to get extra audio data in before you start. In streaming audio, just as in streaming video, both the client and server cooperate for uninterrupted sound. The client side buffers a few seconds of sound before it starts sending it to the speakers and tries to keep ahead of itself throughout the streaming session.

Streaming Games _ A technology which allows games to be streamed in real-time via a high midband connection to games devices whilst not actually transferring the whole game. The technology precludes the need for either CD-ROM or hard drives.

Streaming Media _ Refers to supplying a constant service, often real-time, of a medium. Although broadcast TV has done this from the beginning and SDI streams data, the term is one more usually associated with delivery by networks, including the Internet. The transmission comprises a stream of data packets which can be viewed/heard as they arrive though are often buffered to compensate for any short interruptions of delivery. For the Internet, media is usually highly compressed to offer acceptable results with 28 kb/s for audio and upwards of 64 kb/s for video. As Internet transfers are not deterministic, pictures and sound may not always be constantly delivered.

Streaming Video _ A one-way video transmission over a data network. It is widely used on the Web as well as private intranets to deliver video on demand or a video broadcast. Unlike movie files (MPG, AVI, etc.) that are played after they are downloaded, streaming video is played within a few seconds of requesting it, and the data is not stored permanently in the computer. Watching momentary blips in a video are annoying, and the only way to compensate for that over an erratic network such as the Internet is to get extra data in before you start. In streaming video, both the client and server cooperate for uninterrupted motion. The client side buffers a few seconds of video data before it starts sending it to the screen and speakers and tries to keep ahead of itself throughout the streaming session. If the streaming video is broadcast live, then some might considered it "real-time video." However, real-time means no delays, and there is a built-in delay in streaming video.

Stretch Algorithm _ A 4:3 picture from cable, satellite or over-the-air TV can be stretched to fill a 16:9 TV using stretching algorithms. Most manufacturers accomplish this by stretching the sides of the picture more than the center, reducing noticeable distortion.

Stretch Blt _ An enhanced type of bitblt used for resizing video images. The function expands or contracts the number of bits while moving them from main memory to the display memory.

Striping a Tape _ Preparing a tape for editing by recording continuous control track, time code, and a video signal (such as black or color bars).

Structure - borne Acoustics _ When mounted in a digital device, the hard drive generates additional noise as a result of vibration. This type of noise, caused by the hard drive's proximity to other system components, is referred to as structure-borne acoustics.

Stylus _ a pen-shaped object for pressing, not making ink or graphite (the carbon in pencils) marks. Sumerian people, thousands of years ago, would use a stylus to press the marks of their alphabet into soft writing surfaces. In computing, we use a stylus to make specific contact with a screen or graphics tablet which is sensitive to the position and pressure of the stylus. Graphic artists use a stylus to draw and/or edit using a computer - finer than a mouse "pointer", and able to "press" harder or more softly on the specially-designed graphics tablet (another input device), the stylus allows the artist to draw freely, as with a pencil, and to make minute (very fine) changes in the appearance of the picture.

Sub Bass _ Frequencies below the range of typical monitor loudspeakers. Some define sub-bass as frequencies that can be felt rather than heard.

Sub Carrier _ The frequency on which color information is modulated in a color TV system - 4.43 MHz in Europe, 3.58 MHz in USA/Japan.

Subcarrier Phase Shifter _ Special circuitry that controls the phase relationships of the two parts of the encoded color signal, ensuring the relationship is correct during recording, transmission, and reproduction.

Subchannels (or subcodes) _ Audio CDs have 8 subchannels of non-audio data interleaved with the audio data, called the P, Q, R, S, T, U, V, and W channels. You can think of them as small, separate streams of data running alongside the audio, that can be read by a player at the same time as the audio, if the player is "smart" enough to interpret them. For example, CD+Graphics CDs (karaoke) store rudimentary graphics and text in the subchannels, but you need a special player to read and display this information. The P and Q channels are used to tell an audio player how to play back an Audio CD. The Q channel contains the index markers. In the pause (gap) before a track begins, the index marker is set to 0 (zero). When a track begins, the index marker changes to 1. (If a track con-

tains subindexes, these are incremented by 1 sequentially during the track. In this case the Q channel might contain 1, 2, 3, 4, and so on.) When the track ends, the Q channel index marker goes back to 0, then re-starts at 1 when the next track begins.

Subdomain _ A lower-level component of a domain name. For example, **www.my-company.com** and **support.mycompany.com** are subdomains of **mycompany.com**, which is known as a "second level domain."

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

Sub-pixel _ A spatial resolution smaller than that of pixels. Although digital images are composed of pixels it can be very useful to resolve image detail to smaller than pixel size, i.e. sub-pixel. For example, the data for generating a smooth curve on the screen needs to be created to a finer accuracy than the pixel grid itself - otherwise the curve will look jagged. Again, when tracking an object in a scene or executing a DVE move, the size and position of the manipulated picture must be calculated, and the picture resolved, to a far finer accuracy than the pixels - otherwise the move will appear jerky. Moving an image with sub-pixel accuracy requires picture interpolation as its detail, that was originally placed on lines and pixels, now has to appear to be where none may have existed, e.g. between lines. The original picture has to be effectively rendered onto an intermediate pixel/line position. The example of moving a picture down a whole line is achieved relatively easily by readdressing the lines of the output. But to move it by half a line requires both an address change and interpolation to take information from the adjacent lines and calculate new pixel values. Good DVEs work to a grid many times finer than the line/pixel structure.

Subsampled _ Subsampled means that a signal has been sampled at a lower rate than some other signal in the system. A prime example of this is the 4:2:2 Y':Cb:Cr color space used in ITU-R BT.601. For every two luma (Y") samples, only one Cb and Cr sample is present. This means that the Cb and Cr signals are subsampled.

Subsystem _ A secondary or component part of a system, as a hard drive is a subsystem of a personal computer.

Subtractive Synthesis _ The process of creating a new sound by filtering and shaping a raw, harmonically complex waveform.

Subwoofer _ A speaker designed to deliver extremely low-frequency sound (usually below 100 Hz). A true subwoofer should be able to at least reach into the bottom octave (20-40Hz). Active subwoofers have built-in crossover circuitry to filter the low-frequency signal. Passive subs draw power from an amplifier or receiver, while powered subs have their own amplifier.

Super Black _ Video that is darker than the standard black level.

Super Nintendo Entertainment System _ The SNES (also known as Super Famicom) console was released in 1990 and sold some 30 million units world-wide. Now superseded by the newer systems.

Super VideoCD _ A standard for storing video and audio on a CD that provides better video quality than VCD and standard VHS. Defined by the China National Technical Committee of Standards on Recording, holds 35-70 minutes of digital audio and video information. MPEG-2 video is used, with a resolution of 480 x 480 (29.97 Hz frame rat_e) or 480 x 576 (25 Hz frame rate). Audio uses MPEG-1 layer 2 or MPEG-2 at a bit rate of 32-384 kbps, and supports four mono, two stereo, or 5.1 channels. Subtitles use overlays rather than subpictures (DVD-Video) or being encoded as video (VideoCD). Variable bit-rate encoding is used, with a maximum bit rate of 2.6 Mbps. Super Video CDs will play back on some DVD settop players.

Super White _ Video that is brighter than the standard white level.

SuperAudioCD _ A new optical audio storage standard that competes against DVD-Audio in order to replace the good old audio CD.

Supercomputer _ The fastest computer available. It is typically used for simulations in petroleum exploration and production, structural analysis, computational fluid dynamics, physics and chemistry, electronic design, nuclear energy research and meteorology. It is also used for real-time animated graphics.

Supplements _ "Extras" included on special edition DVDs besides the movie itself. Examples include commentary tracks, theatrical trailers, TV spots, "making-of" documentaries, cast bios and production notes.

Surface Mapping _ Very often, when objects are to be rendered, in order to achieve a more realistic look, a surface map is applied to an object or a part of an object. A surface map is really just a picture which is wrapped around an object in one or more fashion. A surface map can be a decal placed onto a bumper of a car or a brick texture put on a wall in order to make it look more realistic. Surface maps are sometimes referred to as textures. Sometimes simple projection of a surface map will not do a trick. If actual texture needs to be seen, a bump map can be used. When rendering a bump map, the computer looks at the different black and white values of the image and makes the surface of the rendered object look as if it had such a texture. There are also other ways of applying surface maps. Some make parts of an object transparent and are referred to as opacity maps. Others can make an object shiny or dull. Depending on the software package, there may be a few other effects which can be created using surface maps.

Surface Modeling _ A mathematical technique for representing solid-appearing objects. Surface modeling is a more complex method for representing objects than wireframe modeling, but not as sophisticated as solid modeling. Surface modeling is widely used in CAD (computer-aided design) for illustrations and architectural renderings. It is also used in 3-D animation for games and other presentations. Although surface and solid models appear the same on screen, they are quite different. Surface models cannot be sliced open as can solid models. In addition, in surface modeling, the object can be geometrically incorrect; whereas, in solid modeling, it must be correct.

Surfing _ Nothing to do with beaches, tides or Miami. It's the metaphor used to describe what you are doing when you are browsing the Net.

Surrogate Image _ A representation of the original image, used for study.

Surround _ Generic term for various room sound procedures. Surround systems are geared towards achieving a more natural spatial sound reproduction, during which the listener is not only exposed to acoustic irradiation from the front, but sits in the center of sound events.

Sustained Transfer Rate _ The rate that a hard drive can transfer data continuously. For a digital video stream from a camcorder, the sustained transfer rate has to be greater than 3.6 MB/sec.

SVGA _ *Super video graphics array* - A term used to denote resolutions higher than VGA (640 x 480). SVGA computer graphics cards have a resolution of 800 x 600 (480,000 pixels) but may be able to output resolutions of up to 1280 x 1024 and 16 million colors.

S-VHS _ This stands for "Super-VHS" and is an analog videotape format providing approximately 400 lines of resolution on SDTV. S-VHS is based on VHS videotape and is the same physical size as VHS but S-VHS records a higher image quality. It was invented by JVC, who also invented the original VHS format.

S-Video _ Separate video, also called Y/C video. Separate luma (Y") and chroma (C) video signals are used, rather than a single composite video signal. By simply adding together the Y" and C signals, you generate a composite video signal. S-Video connections provide a superior image quality compared to standard, component home RCA connections. Also know as a Y/C connection.

Swapping _ In the world of video games, swapping is an alternative method of defeating copy protection or territorial lockout, usually used early in a system's life, before a mod chip or other more convenient method has been devised. Swapping involves booting a system with a known-good game and replacing it with the foreign or illegitimate disc at the precise time when the system isn't checking the disc.

Sweetening _ Electronically improving the quality of an audio or video signal, such as by adding sound effects, laugh tracks, and captions.

SWF _ The SWF graphic file format is a version of the Macromedia Flash Player vector-based graphics format introduced in 1997. The SWF file format is ideal for presenting vector-based interactive and animated graphics with sound for the Web. Vector images are ideal for graphics with solid areas of color and distinct object definitions. Because a SWF file is vector-based, its graphics are scalable and play back smoothly on any screen size and across multiple platforms. A vector animation usually has a smaller file size than a bitmap animation.

SXGA _ *Super extended graphics array* - A graphics standard with a resolution of 1280 x 1024 (1,310,720 pixels). This exceeds XGA (1024 x 768, at 786,432 pixels).

Symbian OS _ An open standard operating system for data-enabled mobile phones (smart phones) from Symbian Ltd. It supports Java, PC synchronization, Bluetooth local wireless access and GPRS packet-switched data. The first phone to use Symbian OS was the Nokia 9210 Communicator in 2001. Evolving from the EPOC operating system, the company was originally the Psion Software division of Psion PLC. In 1998, Ericsson, Nokia, Motorola and Psion created the company to support the EPOC OS as an independent entity.

Sync _ *Synchronization* - In video, sync is a means of controlling when things happen with respect to other things. This is accomplished with timing pulses to insure that each step in a process occurs at exactly the right time. For example, horizontal sync determines exactly when to begin each horizontal line (sweep) of the electron beam. Vertical sync determines when to bring the electron beam to the top left of the screen to start a new field. There are many other types of sync in a video system. Also called "sync signal" or "sync pulse".

Synchronous Data Transfer _ Carries separate timing information (clock data) for keeping send and receive operations in step. The data bits are sent at a fixed rate so transfer times are guaranteed but transfers use more resources (than asynchronous) as they cannot be shared. Applications include native television connections, live video streaming and SDI. Operation depends on initial negotiation at send and receive ends but transfer is relatively fast.

Synthesized Music _ Synthesized music is a little bit like a player piano - the composer writes the music as he normally would, and the computer plays it out automatically, like a piano. The difference here is that a variety of instruments can be represented by samples of their real counterparts.

Synthesizer _ A device that generates sound by creating waveforms electronically (such as subtractive or FM synthesis) or from stored samples of musical instruments (wave table synthesis). Although rudimentary electronic instruments were developed as far back as the 1920s, it was Robert Moog who popularized the synthesizer in the 1960s. The term itself was coined after his devices, which were the first to combine an electronic (piano-style) keyboard with extremely flexible sound creation capabilities. In the 1970s, the Minimoog portable synthesizer was widely accepted.

Synthespian _ The electronic characters in the film *Toy Story* and the dinosaurs in *Jurassic Park* show that computer imaging systems can generate extraordinarily plausible animated images. The next stage, presaged by that eighties creation named for a multi-storey car park sign, *Max Headroom*, is to simulate human actors with accurate depiction of movements and expressions; such a character is portrayed by William Gibson in his recent novel *Idoru*. It is said that minor characters in the backgrounds of some films are already computer-generated, but realistic close-ups of faces, for example, are still beyond the capabilities of the art. But nobody in the industry doubts realistic electronic actors will come soon, though the technique raises moral and intellectual rights issues. The word being used in the industry for such creations is *synthespian*, a blend of *synthetic* and *thespian*. In the USA, the word has been a trademark since the late 1980s of the Kleiser-Walczak Construction Co., whose principals, Jeff Kleiser and Diana Walczak, worked on *Toy Story*, *Judge Dredd*, and many other films, and have pioneered many of the techniques. Other terms sometimes used are *cyberhuman* and *vactor* (for virtual actor).

System _ An assembly of hardware and software, i.e., input device, workstation and output component.

System Conflict _ this is bad news, and may continue happening until the operating system collapses and has to be reinstalled from scratch. System conflicts or crashes occur when a piece of software, whether it is part of a large program or one of the new control panels and extensions you have loaded recently, gives it instructions that don't fit with the normal operating system instructions, so the computer "freezes", or quits, and has to be restarted. System conflicts can best be avoided by only loading the software you really need, and by avoiding "buggy" programs, ones that don't suit your operating system well, and are involved often enough in these potentially damaging crashes, for you to become suspicious of them.

System Files _ The files needed to run an Operating System.

System Palette _ A color palette chosen by a computer system and applied to all digital images.

System Software _ Programs used to control the computer and develop and run application programs. It includes operating systems, TP monitors, network operating systems and database managers.

T120 _ CCITT standard for digital computer data interchange videoconferencing.

Table 2 (ATSC) _ Digital television offers new opportunities for the delivery of audio to the home. The digital audio compression system documented in the ATSC standard for Digital Television is AC-3. The services may contain complete program mixes or only a single program element. Potentially this means that a viewer can choose from a wide range of audio services as long as the receiver has the capability of decoding them.

Table 3 (ATSC) _ Table 3 of the ATSC DTV Standard, Annex A, summarizes the picture formats allowable for DTV transmission in the USA. Any one of these may be compressed and transmitted. An ATSC receiver must be able to display pictures from any of these formats. For each frame size, a range of alternative frame rates is available to provide compatibility with existing transmission systems and receivers. 29.97 Hz is needed to keep step with NTSC simulcasts. This frame rate is not required once NTSC is no longer transmitted! 30 Hz is easier to use, and does not involve considerations such as drop-frame timecode. 24 Hz progressive (24p) offers compatibility with film material. A choice of progressive or interlaced scanning is also available for most frame sizes . Table 3 is concerned with video formats to be handled in the ATSC system rather than defining standards for video production. ATSC's Table 1 of annex A refers to the standardized video production formats likely to be used as inputs to the compression table.

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

Tablet _ The pad or digitizing tablet used in conjunction with a styles or mouse to give instructions to the computer.

Tablet Computer _ A complete computer contained in a touch screen. Tablet computers can be specialized for only Internet use or be full-blown, general-purpose PCs with all the bells and whistles of a desktop unit. The distinguishing characteristic is the use of the screen as an input device using a stylus or finger. Starting in 2000, Microsoft promoted a version of its Windows XP for tablet computers, branding them "Tablet PCs."

Tag _ A programming language tool that contains formatting directions.

Tag Files _ Tag Files are image information that is "tagged" or attached to the JPG image. Tag files contain information on quality, resolution, aperture, shutter speed, ISO, Strobe, histogram, etc according to the settings in the camera at the time that the image was captured. This information can be used by some image editing software to enhance color accuracy.

Tagged Queuing _ The ability of the drive to receive multiple I/O processes from each initiator.

Tailgate (1394 to EIDE Bridge Controller) _ Specification defining the requirements for a low-cost bridge device that allows existing legacy EIDE/ATAPI devices to be connected to the 1394 (FireWire) bus using EIDE protocol.

Targa (TGA) _ An image file format widely used in computer systems. It was developed by Truevision Inc.

Taskbar _ Unless you're really clever and know how to move it elsewhere, it's usually set to be at the very bottom of your Windows Desktop. There's only one Taskbar on your PC (but lots of Toolbars). The Start Button is on it, and if the Quick Launch Taskbar is active, it may also contain several other Shortcut Icons to your favorite programs or applications.

TBC _ *Time Base Corrector* - A TBC balances out time faults in video signals which, for example, may occur due to flutters. Such time faults may take the form of a jittering picture or jittering object edges in the picture. In general, professional video recorders, switchers or other video devices are equipped with an integrated TBC. However, stand-alone TBCs are also avail- able which can be synchronized with the remaining studio equipment via a reference signal (Genlock).

TC _ Time Code - An 80 bit digital signal used to identify each frame of the videotape.

TCP/IP _ These two protocols (*Transmission Control Protocol/Internet Protocol*) were developed by the U.S. military to allow computers to talk to each other over long distance networks. IP is responsible for moving packets of data between nodes. TCP is responsible for verifying delivery from client to server. TCP/IP forms the basis of the Internet, and is built into most every common operating system. It was designed for transferring data files rather than television or film pictures which are large - 1 MB or more each. Thus although TCP/IP has the advantage of being widely compatible it is a relatively inefficient way of moving picture files.

TDM _ Time division multiplex - The management of multiple signals on one channel by alternately sending portions of each signal and assigning each portion to particular blocks of time.

Tearing _ A lateral displacement of the video lines due to sync instability. Visually it appears as though parts of the images have been torn away.

Techie _ A technical person.

Technology _ Applying a systematic technique, method or approach to solve a problem. Much of today's technology implies the use of computers.

Technophile _ A person who enjoys learning about and using electronics and computers.

Technophobic _ Afraid of technology.

Technorealism _ Dealing with technology in a realistic manner. It seeks to attain a balance between the two extremes of either believing technology will make the world a utopia or thinking that it will destroy everything.

TEI _ Text Encoding Initiative - An international project to develop guidelines for the preparation and exchange of electronic texts for scholarly research. The TEI has created a set of SGML DTDs for the encoding of humanities and social science-related texts.

Telecommunications _ An electronic method of transmitting information from one location to another over a telephone network.

Telecommunity _ A society in which information can be transmitted or received freely between all members without technical incompatibilities.

Teleconferencing _ A meeting between people at two or more locations who can communicate by audio and/or visual devices often via telephone and/or closed-circuit television.

Telesync _ One of the multiple terms used by movie pirates to describe the source material that was used to make a bootlegged pirate copy, normally distributed in VideoCD, SVCD or DivX format. Precisely Telesync means a copy which was shot in an empty cinema or from the projection booth with a professional camera, directly connected to the sound source.

Teletext _ A method of transmitting data with a video signal. For digital transmissions such as HDTV and SDTV, the teletext characters are multiplexed as a separate stream along with the video and audio data. It is common practice to actually embed this stream in the MPEG video bitstream itself, rather than at the transport layer. Unfortunately there is no wide-spread standard for this teletext stream - each system (DSS, DVB, ATSC, DVD) has its own solution. The practical place in MPEG to stick teletext data is in the user data field, which can be placed at various frequencies within the video stream. For DVD, it is the group of pictures header, which usually proceed intra pictures (this happens about 2 times a second).

Telnet _ This is a terminal emulation program that allows an authorized user to access another computer on the Internet, and use that computer as if it were a local computer.

Template _ A work pattern in a software program. It includes predefined formats and settings to save user's efforts and reduce risks of making mistakes. Saving basic documents as templates saves a lot of time.

Tempo _ the rate of speed at which a musical composition proceeds (i.e. the beat). Usually uses a quarter note as the timing reference.

Temporal _ Relating to the sequence of time or to a particular time.

Temporal Aliasing _ A defect in a video picture that occurs when the image being sampled moves too fast for the sampling rate. A common example occurs when the rapidly rotating spokes of a wagon's wheels appear to rotate backwards because of video scanning that moves more slowly than the spokes.

Temporal Compression _ A compression method that reduces the data contained within a single video frame by identifying similar areas between individual frames and eliminating the redundancy.

Temporal Resolution _ The ability of the display to reproduce adequate detail to allow the visual system to distinguish the separate parts or components of an object that is moving through the display.

Terabyte _ TB - A measurement of data storage capacity on a computer. 1024 Gigabyte, 1 trillion -1,099,511,627,776 bytes.

Terminal _ a) a point of connection for closing an electrical circuit or in computer "speak, _ **b)** a piece of hardware that allows commands to be sent to a main frame computer from a keyboard and VDU.

Terminal Emulator _ Allows a computer to emulate (which means imitate or copy) several terminal types.

Termination _ A load, or impedance at the end of a cable or signal line used to match the impedance of the equipment that generated the signal. The impedance absorbs signal energy to prevent signal reflections from going back toward the source. For video signals termination impedance is typically 75 ohms; for sync signals it is usually 510 ohms.

Terrabyte _ 1 trillion bytes.

Terrestrial _ A broadcast signal transmitted "over the air" to an antenna.

Terrestrial Broadcasting _ This is a broadcast signal transmitted "over-the-air" to an antenna.

Territorial Lockout _ A method of preventing a video game designed for one territory (Japan, the United States, and Europe) from working on a system intended for another territory. Such a lockout can be implemented in a number of ways. On CD-based systems, a country code on the disc is usually checked by the system's BIOS and then accepted or refused. International cartridge systems usually contain variations in the dimensions of their actual casings so that foreign cartridges won't fit into the systems" slot.

Tessellation _ Processing 3D graphics can be pipelined into three-stages - tessellation, geometry, and rendering. Tessellation is the process of subdividing a surface into smaller shapes. To describe object surface patterns, tessellation breaks down the surface of an object into manageable polygons. Triangles or quadrilaterals are two usually used polygons in drawing graphical objects because computer hardware can easy manipulate and calculate these two simple polygons. An object divided into quads and subdivided into triangles for convenient calculation.

Texel _ A texture element. A texel is obtained from texture memory and represents the color or the texture to be applied to a corresponding fragment.

Text-to-speech _ Converting text into voice output using speech synthesis techniques. Although initially used by the blind to listen to written material, it is now used extensively to convey financial data, e-mail messages and other information via telephone for everyone. Early text-to-speech (TTS) systems had a very robotic sound; however, with the advent of high-speed chips and advanced software techniques, text-to-speech has become more natural.

Texture _ Textures are 2D skins that are wrapped around a 3D frame too allow, for example, a polygon head to have facial expressions portrayed upon it.

Texture Anti-aliasing _ An interpolation technique used to remove texture distortion, staircasing or jagged edges, at the edges of an object.

Texture Filtering _ Removing the undesirable distortion of a raster image, also called aliasing artifacts, such as sparkles and blockiness, through interpolation of stored texture images.

Texture Mapping _ The process of applying a texture to 3D surfaces. It is based on a stored bitmap consisting of texture pixels, or texels and consists of wrapping a texture image onto an object to create a realistic representation of the 3D object in space. The object is represented by a set of polygons, usually triangles. The advantage is complexity reduction and rendering speed, because only one texel read is required for each pixel being written to the frame buffer. The disadvantage is the blocky image that results when the object moves.

TFT _ *Thin-Film Transistors* are a core component of active matrix liquid crystal displays (LCD monitors). TFT LCDs offer low power consumption, fast response, and high image quality equivalent to that offered by

CRT displays. High production costs were initially the main disadvantage of TFT LCDs, but costs have continued to drop with the dramatic increase in production volume. This increase reflects the growing number of color notebook PCs that employ TFT LCDs. Most of the LCD screens available today are based on a TFT. TFT is a Twisted Nematic (TN) type LCD whose two polarized layers are placed at 90 degrees to each other. It is controlled by the TFT that matches up with each pixel. Amorphous silicon TFT, which first appeared in 1979, is the most commonly used of today's TFT LCDs. But the polysilicon TFT, which is integrated with the liquid crystal driver circuit, is gaining in popularity.

TFT LCD _ *The Thin-Film Transistor Liquid Crystal Display* - refers to an LCD device that is based on a TFT. Since the TFT LCD offers low power consumption and high image quality, most of today's notebook PCs employ a TFT LCD for their monitor screen. However, this is not necessarily the case for low-end models. In recent years, an increasing number of TFT LCD monitors are being sold as monitors for desktop PCs. Compared to the conventional CRT monitors, TFT LCD monitors offer considerable space savings due to their significantly smaller depth dimension.

tga _ The old True Vision *Targa* File used as a storage format for bitmapped video images and handles 16-, 24- and 32-bit color.. It is not seen very often nowadays since jpeg's, gif's and bitmaps have become more popular and taken over the limelight.

Thin Client Architecture _ A computer system in which data is stored centrally, with only limited storage capacity at the various points of use.

Three-point Editing _ An editing feature for replacing footage in a program that lets editors insert a clip into an existing program where only three of the four In and Out points of the clip to be inserted and the portion of the program to be replaced are known. The three-point editing feature automatically specifies the fourth point.

Throughput _ The speed with which a computer processes data. It is a combination of internal processing speed, peripheral speeds (I/O) and the efficiency of the operating system and other system software all working together.

Thumb culture _ Refers to handheld, wireless devices and mobile phones that users often work with their thumbs.

Thumbnail _ A small, low-resolution version of a larger image file that is used for quick identification or speedy editing choices.

Thunderbird _ In mid-2000 AMD introduced an enhanced version of the Athlon processor, codenamed "Thunderbird". Fabricated using AMD's 0.18-micron process technology, the new core replaced the K75 chip's 512KB of off-die Level 2 cache by 256KB of cache integrated onto the die itself and running at the full clock speed of the processor. This is in contrast to the original Athlons that operated their L2 cache at a certain fraction of the core clock speed; for example, in the case of the Athlon 1GHz, its external L2 cache ran at a maximum of 330MHz. As well as boosting performance, moving the cache on-die also allowed AMD to follow Intel's lead in moving from slot-based processors in favor of a socket form factor - in AMD's case, a 462-pin format, christened Socket A. The last Athlon processors based on the Thunderbird core were released in the summer of 2001, by which time speeds had reached 1.4GHz. Hereafter, the Athlon was to be replaced by the Athlon XP family - "XP" standing for "extra performance" - based on the new Palomino core.

THX _ *Tomlinson Holman Experiment* - processing specifications for audio components (i.e. amplifiers, processors, speakers, etc) for both home and theatre established by Lucasfilm. THX specifications are designed to provide consistent audio reproduction as close as possible to what was originally intended. Professional and home audio equipment can carry the THX logo after obtaining THX certification from Lucasfilm. THX-certified theatres use professional Dolby cinema processors for playing Dolby soundtracks (which is why both logos can appear on the same cinema marquee), and THX-licensed home theater systems are based on Dolby Surround Pro Logic and Dolby Digital decoding.

tiff _ *Tagged Image File Format* - A flexible bitmap image file format that is lossless and produces no artifacts as is common with other image formats such as JPG. This file type will work on both a PC or Apple Mac. It supports almost any color depth and allows various forms of compression. A tiff file is

usually quite large because it retains the maximum amount of information about the image that can possibly be saved. TIFF is a image format supported by virtually all paint, image-editing, and page-layout applications. Also, virtually all desktop scanners can produce TIFF images. The TIFF format supports CMYK, RGB, and grayscale files with alpha channels, and Lab, indexed-color, and Bitmap files without alpha channels. TIFF also supports LZW compression.

Tiling _ The process of breaking down an image or page into sections for editing purposes. This is necessary for editing large files in most imaging systems.

Timbre _ The quality of a sound that distinguishes it from other sounds of the same pitch and volume. The distinctive tone of an instrument or a singing voice. Tone color.

Time Base Corrector _ *TBC* An electronic device that, when connected to the output of a VTR, corrects the stability and timing of the VTR's playback video. This is achieved by stripping the unstable horizontal and vertical sync pulses from the video signal, and replacing them with new, clean sync pulses.

Time Base Error _ Slight errors in the line-to-line position of video information which occur between recording and playback. At the time of playback, these appear as serrations, tending to make the edges of the image waver.

Time Base Generator _ A sync generator that puts a clock signal on the video tape to refer to for precise horizontal lock-up of an image.

Time Code _ A sequential code number assigned to successive video frames on tape. Each frame has its own time code, which is electronically encoded on the tape in the form hours _minutes _seconds _frames.

Time Code Generator _ A special signal generator designed to generate and transmit time code at one of the international formats and rates.

Time Code Reader _ A counter designed to read and display time code.

Time Code Type _ The word "type" is the key to understanding this phrase. Type defines the counting method that is employed by the reader. There are two SMPTE types - 30 (also called non-drop "ND" or non-drop frame "NDF") and DF (drop frame). EBU and film

types are the same as their respective speeds, 25 and 24.

Timecode Editing _ Using timecode as a precise reference for editing. Each frame has its own individual timecode number, which enables fast and frame accurate editing as well as automatic editing via an edit controller.

Time-Lapse _ Capturing a series of images at preset intervals.

Timeline _ The graphical representation of program length onto which video, audio and graphics clips are arranged. In nonlinear editing, the area in which audio and video clips are applied, typically giving duration in frames and seconds. The relative size of clips on the timeline gives you an accurate idea of the length of your media clips. Also seen in animation and composition software.

Timeout _ A facility whereby after a certain period of user inactivity the connection to a Web Server is automatically terminated.

Tint _ A relative measure of the amount of white in a given color.

TIRIS _ *TI Registration and Identification System* uses radio frequency identification to electronically control, detect and track objects by manipulating radio signals. Applications include traffic management, logistics systems, antitheft devices and security systems.

TIVO _ or *Replay TV* - Two brand names for a consumer video file server. These units will continually record what you are watching on television, allowing you to immediately replay parts of the program, pause the program, or record for viewing later. It is expected that these units will eventually be incorporated into Set-Top Boxes and are already available in some STBs used for Direct TV.

tmp file _ *Temporary Files* - These are created on your hard disk when you surf the Internet, install new software or expand archived (zipped) files. Sometimes they are deleted automatically after a couple of days but more likely than not they're taking up valuable disk space in your c :\windows\temp (yellow) folder. All .tmp files in this folder can safely be deleted when off-line and all applications are closed.

Toggle _ An on/off switch, allowing the user to switch back and forth between a function.

Token Ring _ Method used to administer a network to ensure it is clear before transmitting a message. A single "token" is continuously passed around the network and only the node that has it can transmit. Two forms exist - Standard Token Loop (as above) and Early Token Release, where the token is attached to the end of the transmitted message so creating a train of data within the loop.

Tonal Range _ The range of light and dark areas in an image. Tonal range can be divided into three different areas - shadows, midtones, and highlights. Shadows are the darkest areas of an image, highlights are the lightest areas, and midtones are the areas with tones between the lightest and darkest areas.

Toolbar _ It's the rectangular strip usually at the top of your screen that contains icons and shortcuts to various events in the application that is currently running. By clicking on a Toolbar Icon you get immediate access to that particular feature.

Toolbox _ The floating palette of tools (mostly in graphic software) for selecting, painting and editing images.

Top Plane _ The plane created by the x and z axes.

Touch Panel _ also *Touch Screen* A display screen that is sensitive to the touch of a finger or stylus. Touch screens are very resistant to harsh environments where keyboards might eventually fail. They are often used with custom-designed applications so that the on-screen buttons are large enough to be pressed with the finger. Applications are typically very specialized and greatly simplified so they can be used by anyone. However, touch screens are also very popular on PDAs and full-size computers with standard applications, where a stylus is required for precise interaction with screen objects. There are two primary technologies used for touch screens and both use a clear glass panel overlaid onto the CRT or LCD screen. The resistive method is completely pressure sensitive. It uses a plastic layer on top of a metallic-coated glass layer, separated by spacers. When pressed, it shunts the current in the glass panel, and the X-Y coordinates pick up the location on the screen. The capacitive method uses a metallic coated glass panel, but without the plastic overlay. It senses the change in current from the charge in the your finger or a stylus. The stylus used with this technique must emit a charge and is thus wired to the computer.

Touchpad _ a small touch sensitive pad that acts as an alternative to your mouse.

TOV _ *Threshold of visibility* -The impairment level (or D/U in d_ B) beyond which a source of impairment or interference may introduce visible deficiencies in more sensitive program material.

Track _ a) The term dates back to multitrack tape where the tracks are physical stripes of recorded material, located side by side along the length of the tape. _ **b)** A horizontal band across the time line window in your NL edit program that graphically represents a series of clips. The time line window has multiple tracks containing different types of media. _ **c)** Every time you write to CD, you create at least one track, that is preceded by a gap. Any session may contain one or more tracks, and the tracks within a session may be of the same or of different types (for example, a Mixed-Mode CD contains data and audio tracks. _ **d)** A concentric magnetic circle pattern on a disk surface used for storing and reading data.

Track Envelope _ rubberband control of audio level.

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

Trackball _ A controlling device for various functions on a image workstation.

Tracking _ The angle and speed at which tape passes the video heads.

Tracking Image _ Following a defined point, or points, in a series of pictures in a clip. Initially this was performed by hand, using a DVE. Not only was this laborious but it was also difficult, or impossible to create sufficiently accurate results - usually due to the DVE keyframe settings being restricted to pixel/line accuracy. More recently image tracking has become widely used, thanks to the availability of automatic point tracking operating to sub-pixel accuracy. Used within an integrated system the tracking data can be applied to control DVE picture moving for such applications as removal of film weave, replacing objects in moving video etc.

Track-to-Track Seek Time _ The time that elapses when the read/write heads of the hard disk move from one track to an adjacent track.

Transcode _ a) The process of converting a file or program from one formator resolution to another. _ **b)** Converting from one video component set to another (e.g., from Hi8 to Betacam SP.

Transfer Rate _ The rate at which the hard drive sends and receives data from the controller. Processing, head switches, and seeks are all figured into the transfer rate in order to accurately portray drive performance. The burst mode transfer rate is separate from transfer rate, as it refers only to the transfer of data into RAM.

Transformation _ Translation, scaling, and rotation of a geometric object. A series of mathematical operations that act on output primitives and geometric attributes to convert them from modeling coordinates to device coordinates.

Transient _ Usually the brief initial (or attack) portion of a waveform. Transients provide important cues that help our ears recognize sounds, but they are often difficult for an audio system to reproduce because of their high amplitudes and short rise times.

Transient Response _ The ability to respond quickly and accurately to transients. Transient response affects reproduction of the attack and decay characteristics of a sound.

Transistor _ A small chip of semiconductor material that amplifies or switches electrical current. Known as discrete (single function) semiconductors, transistors replaced vacuum tubes and started the solid state revolution

Transition _ A change in video from one clip to another. Often these visual changes involve *effects* where elements of one clip are blended with another.

Translation _ The process of changing the position of an object without changing its shape, size or orientation.

Transmit _ to deliver information between two or more locations. Transmitted information occurs through media such as Local Area Networks/Wide Area Networks and cable, coax, fiber optics and twisted pair wires, in addition to satellites and radio or optical wireless devices.

Transparency _ a) Percentage of opacity of a video clip or element. An opaque object is one that entirely blocks light coming from its far side, relative to the player's position. A transparent object is not entirely opaque; it can be seen, but things directly behind it are also visible. Fog in a 3D game is a good example of a transparent effect _ **b)** Listening term used to describe audio quality where the high frequency detail is clear and individual sounds are easy to identify and separate. The more transparent the sound, the clearer the auditory picture.

Transpose _ To shift a musical signal by a fixed number of semitones.

Trapping _ An overlay between abutting colors/elements. Traditionally done by using chokes and spreads, but graphics software gives users the ability to do traping for type and objects.

Trashware _ Software that is so poorly designed that it winds up in the garbage can.

Tremelo _ A rapid alternation of two tones, usually a third apart. On a synthesizer, this effect can usually be controlled by the modulation wheel or modulation amount.

Triangle Wave _ Symmetrical triangular shaped wave containing odd harmonics only, but with a lower harmonic content than the square wave.

Tri-linear MIP Mapping _ A method of reducing aliasing artifacts within texture maps by applying a bilinear filter to four texels from the two nearest MIP maps and then interpolating between the two.

Trim Handles _ The frames before and after the In and Out points for a source clip to allow for trimming and transitions.

Trimming _ Trimming is the exact fitting of the length of a clip at a cutting point. For non-linear systems, this can be implemented at any point in time of the cut. In many systems, this can also be done by means of a trim editor which would, ideally, provide the relevant functionality.

Triple Buffering _ Triple buffering is a technique of dividing the frame buffer into three areas - two drawing buffers and one display buffer.

True Color (24-bit color) Images _ Images displayed in 24-bit color (which is also referred to as Photo Realistic Color) are composed of three 8-bit color channels. Each one is similar in characteristics to an to an 8-bit grayscale image in that it contains up to 256 colors. When combined, the red, green and blue channels can provide up to a 16.7 million colors.

True Random Access _ The ability to continuously read any frame, or sequence of frames, in any order at or above video (or real-time) rate. A true random access video store (usually comprising disks) allows editing which offers rather more than just quick access to material. Cuts are simply instructions for the order of replay and involve no copying, so adjustments can be made as often and whenever required. This results in instant and very flexible operation. At the same time technical concerns associated with fragmentation do not arise as the store can operate to specification when fully fragmented, ensuring full operation at all times. This aspect is particularly important for server stores.

True Streaming _ Affording real-time access to content via the Internet or an intranet, true streaming is enabled by a specialized server application, that relies on streaming protocols to adjust the rate of transmission to accommodate available bandwidth.

TrueType (fonts) _ The TrueType vector font format was originally developed by Apple Computer, Inc. The specification was later released to Microsoft. TrueType fonts are therefore supported on most operating systems. Most major type libraries are available in TrueType format. There are also many type design tools available to develop custom TrueType fonts.

Truncation _ Removal of the lower significant bits on a digital word--as could be necessary when sending a 16-bit word on an 8-bit bus. If not carefully handled it can lead to unpleasant artifacts on video signals.

TTL _ a) *Transistor-to-transistor logic -* A digital signal, usually 4 to 5 volts peak-to-peak. The distance limitation is 6-10 feet (1.8-3.0 meters). Signal splitting is acceptable. TTL signals are either on or off, and are characteristic of low resolution computers (CGA/EGA). **_ b)** Through the Lens, used when talking about either an autofocus or auto exposure system that works through the camera's lens.

Tunneling _ The use of specially designed paths to carry multicast traffic over the Internet.

Turnkey _ You just turn the key and it works! A computer (or other) system that comprise all the hardware and software needed.

Turtling _ A fighting game practice in which the player with the most energy takes up a defensive (or turtlelike) position at one end of the arena, blocks or dodges the other player's attacks, and waits for the clock to run out to score a win. Turtling, like camping in first-person shooters, is frowned upon.

TV Crossover Links _ A type of enhancement which notifies users that there is enhanced or Web content associated with a program or an advertisement. A TV Crossover Link appears as a small icon in the corner of the TV screen at a point in time determined by content producers. Clicking the link displays a panel, giving the viewer an option to go to the content enhancement (Web site) or continue watching TV. If the viewer chooses to go to the Web site, the receiver connects to the site, while the current program or advertisement remains on-screen. Pressing the View button on the remote control or keyboard returns to TV viewing.

TWAIN _ *Technology Without An Industry Name* - An acquire interface developed as a standard for communications between scanners, imaging devices, digital cameras and the computer software. TWAIN allows you to import (acquire) an image into your software. This is the generally the interface of choice on the Windows platform.

Tweak _ To adjust or fine-tune.

Tweeker _ A small screwdriver for making sensitive adjustments to audio/ visual and other electronic equipment.

Tweening _ In animation, the process of adding frames between keyframes to produce smooth motion. It's also known in-betweening.

Tweeter _ A speaker used to reproduce the higher range of frequencies. To form a full-range system, a tweeter needs to be combined with a woofer, (2-way system), or a woofer and midrange, (3-way system).

txt file _ Usually a text file created within a text editor such as WordPad or Notepad when using an OCR device such as a scanner. If you want to attach a Word document to an E-mail, save it as a .txt file. It'll be about a twentieth of the size and therefore take a lot less time to send!

Type I, II, III _ Denotes various PC ATA storage devices both flash memory and removable hard disk drives. Type I and II fit in the single-height card slots, Type III only fit in the double-height slots.

U

U-Bit _ Users Bit. A portion of the timecode signal which allows the user to program alpha-numeric information.

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

UDP _ *User Datagram Protocol* like TCP, runs on top of IP networks. Unlike TCP/IP, UDP/IP provides very little error recovery, offering instead a direct way to send and receive datagrams over an IP network. It is primarily used for streaming over the Internet.

UHF _ **Ultra high frequency** - A television broadcast frequency range between 300 and 3000 MHz. Also the name for a type of connector used for video cables.

ULSI _ *Ultra Large Scale Integration* - More than one million transistors on a chip.

Ultimatte _ A trade name for a television matting process especially suitable for film work.

Ultra ATA _ A hard drive interface used with EIDE drives that allows data transfer at rates of up to 33.3 megabytes per second.

Ultra DMA _ A Protocol for transferring data between a hard drive through the Bus to the computer's RAM. Also known as Ultra ATA/33.

Ultra SCSI _ Provides 20 MB/s transfers over an 8-bit bus or 40 MB/s transfers over a 16-bit Wide SCSI bus. Note that these are peak rates. Continuous rates will be considerably less. Also, achieving this will depend on the performance of the connected device. Also known as Fast-20 SCSI.

Ultrasonic _ A frequency higher than can be heard by the human ear. Usually higher than 20kHz.

U-matic _ Old-fashioned videotape format which records video signals and two sound Tracks to a 3/4" tape (19 mm) in the color-under procedure. In Europe, the procedures used included related formats U-matic High Band, U-matic Low Band and U-matic SP. U-matic devices are no longer produced.

Unbalanced Audio Signals _ Signals that are carried on two-conductor cables, one "hot" and one ground. Unbalanced connections save costs, but are more prone to picking up hum and interference with low-level signals.

Uncommitted Editing _ Editing where the decisions are made and the edits completed but any can still be easily changed. Digital video editing offers this ability. This is only possible in a true random access edit suite where the edits need only comprise the original footage and the edit instruction. Nothing is rerecorded so nothing is committed. This way, decisions about any aspect of the edit can be changed at any point during the session, regardless of where the changes are required.

Uncompressed Video _ Raw digitized video displayed or stored in its native size.

Uncorrectable Error _ An error that cannot be overcome using Error Correction Code (ECC) or by re-reading the data when host retries are enabled.

Undercranking _ A process based on the film camera technique of recording frames slower than the anticipated playback rate to create "fast-motion". This process provides unique control of motion images in the camera where motion-blur and other techniques can be incorporated in the process. Panasonic has developed an electronic recording system capable of over/undercrank recording using a process that produces results very much like the film technique, this Panasonic system is known as "VariCam." Sony has utilized a system where interlaced frames can be interpolated to create progressive frames, creating a look of undercranking.

Underscan _ A decreasing of the raster size (H & V) so that all four edges of the picture are visible on the screen. Underscanning allows viewing of skew, tracking, VITC, blanking intervals, copy protection signals, etc., which would not be visible in normal (over-scanned) mode. It is also helpful when aligning test charts to be certain they touch all four corners of the raster. Likewise, when checking the alignment of multiplexer images from a film chain, underscan allows proper framing of the projected image going into the video camera. Underscan is common in computer displays.

Unformatted Capacity _ The total number of usable bytes on a disk, including the space that is required to record location, boundary definitions, and servo data.

Unicast _ The technique whereby a single stream is transmitted to a single end-user; i.e., each end-user gets a unique stream. Bandwidth-hogging unicasting is not as efficient as *multicasting*.

Uninstall _ When you uninstall a program or application, you remove it and all of it's associated setup or data files from your computer. The safest way to do this is within Windows. Always restart (i.e. reboot) your computer after uninstalling a large application or program.

Uninstaller _ A utility program that is specifically designed to be used for safely removing any unwanted software applications from your computer's hard disk. Software application files often get spread all over the place and are difficult to find when you want to manually remove them. Uninstallers track down these "scattered files" wherever they are, and safely delete them.

Uniprocessor _ A single processor. As more and more computers employ multiprocessing architectures, such as SMP and MPP, the term is used to refer to a system that still has only one CPU. Although most desktop computers are uniprocessor systems, it is expected that dual processor systems will become commonplace on the desktop in the coming years.

Unison _ To play the same melody using two or more different instruments or voices.

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.

Universal Remote Control _ A remote that is pre-programmed to operate different-brand components – from VCRs to set-top boxes, stereo receivers to DVD players, even satellite systems.

Unix _ An Operating System specially designed for multi-user environments. It has TCP/IP built in, so it's therefore one of the most popular operating systems for servers using the Internet. Unix works across a wide range of computers, from mainframes and workstations to personal computers. A myriad of commercial applications run on Unix servers, and many Web sites run under Unix. Over the years, there have been many different versions of the OS, and, except for the PC world, where Windows dominates, almost every hardware vendor offers Unix as its primary or secondary operating system. Unix is made up of the kernel, file system and a shell, which is the command line interface with more than 600 commands for manipulating data and text. The major shells are the Bourne shell (original), C shell and Korn shell. Many commands are cryptic, but just as Windows hid the DOS prompt from users, the Motif GUI added a friendly image to Unix. Linux desktops offer a GUI, and many pundits claim that Apple created the best GUI for Unix with its OS X operating system

Unrecoverable Error _ A read error that cannot be overcome by an ECC scheme or by rereading the data when host retries are enabled.

Unsharp Mask _ A method of enhancing the perceptive sharpness of an image by increasing the contrast at the edges of shapes in an image.

Unzip _ This is what you do when you open up (or expand) a previously archived (i.e. compressed) file.

Up Converting _ The process which increases the number of pixels and/or frame rate and/or scanning format used to represent an image by interpolating existing pixels to create new ones at closer spacing. The process does not increase the actual resolution of the image. Up converting is done from standard definition to high definition.

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

Uplink _ The carrier used by Earth stations to transmit information to a satellite.

Upload _ The transfer or uploading of files from a local (host) computer to a specified remote computer at a designated IP Address is known as Uploading. To do this you will need a ftp program.

UPnP _ *Universal Plug and Play* - A set of standards for interoperability of networking devices from Microsoft and the UPnP Forum (www.upnp.org). Announced in mid-1999 as a counter to Sun's Jini technology, UPnP extends the Plug and Play concept to network devices so that they can be installed and set up without manual intervention. For example, the UPnP Internet Gateway specification enables residential Internet gateways to be automatically configured to handle multiple PCs in a home network.

URL _ *Uniform Resource Locator* - is the "address" used to find a document or resource on the World Wide Web. The first part of the address specifies the protocol (typically HTTP for Web pages, FTP for files not residing on a Web server, or RTSP for streaming files); the second part specifies the IP address, or domain name; and the rest specifies the directory structure for finding the discrete file on the host computer.

URL flip _ A coded marker embedded in the timeline of video or audio that calls up a link to a Web page during playback.

URN _ *Universal Resource Name/Number* A storage-independent scheme to name all resources on the Internet with a unique and fixed name. URNs are likely to supersede URLs for identification and referencing of networked resources.

USB _ *Universal serial bus* - USB was developed by seven PC and telecom industry leaders (Compaq, DEC, IBM, Intel, Microsoft, NEC and Northern Telecom). The goal was easy plug-and-play expansion outside the box, requiring no additional circuit cards. Up to 127 external computer devices may be added through a USB hub, which may be conveniently located in a keyboard or monitor. USB devices can be attached/detached without removing computer power. The number of devices being designed for USB continues to grow, from keyboards, mice, and printers to scanners, digital cameras, ZIP drives, etcetera. USB ports are about 10 times faster than a typical serial connection. USB has a maximum bandwidth of 12 Mbits/sec (equivalent to 1.5 Mbytes/sec. Fast devices can use the full bandwidth, while lower-speed ones can transfer data using a 1.5 Mbits/sec subchannel. USB's hot swap capability allows everything to be plugged in and unplugged without turning the system off. USB ports began to appear on PCs in 1997,

and Windows 98 fully supports it. Devices are plugged directly into a four-pin socket on the PC or into a multi-port hub that plugs into the PC or into a device that also functions as a hub for other devices. The USB bus distributes 0.5 amps (500 milliamps) of power through each port. Thus, low-power devices that might normally require a separate AC adapter can be powered through the cable. Hubs may derive all power from the USB bus (bus powered), or they may be powered from their own AC adapter. Powered hubs with at least 0.5 amps per port provide the most flexibility for future downstream devices. Port switching hubs isolate all ports from each other so that one shorted device will not bring down the others. USB ports on the PC and hubs use a rectangular Type A socket. All cables that are permanently attached to the device have a Type A plug. Devices that use a separate cable have a square Type B socket, and the cable that connects them has a Type A and Type B plug.

USB 2.0 _ The newest USB standard, close in throughput speed to FireWire now. Up to 400MB/s.

USB Drive _ A flash memory card that plugs into the computer's USB port. Also known as a "pen drive," "keychain drive," "key drive," "memory key" or "thumb drive. These small devices provide up to 512MB of storage for users on the move.

Usenet _ It's short for Users Network which is a specialized Network linking thousands of Newsgroups that cover every imaginable subject of interest world wide, both on and off the Internet.

User Interface _ The combination of menus, screen design, keyboard commands, command language and online help, which creates the way a user interacts with a computer. If input devices other than a keyboard and mouse are required, this is also included. In the future, natural language recognition and voice recognition will become standard components of the user interface. The user interface is the most important, yet least-understood area in the software industry as programmers are often the ones responsible for designing everything the user interacts with. This is generally a formula for disaster, because most programmers do not have a clue how to do it. Every application has only a handful of basic functions that users need all the time, yet they are buried in arcane menus

and submenus that must be memorized. Since the most popular applications are often the hardest to learn, users have come to expect that software is just plain difficult, when in fact, it could be downright simple if educated user interface designers were involved. Because of the steep learning curves users have gone through, many are afraid to change applications. While the industry touts "productivity gains" for almost every software product, the lost hours frustrating over how to do something, combined with the general reluctance to try something else that could truly be an improvement, all results in lost productivity that cannot be measured. If we are ever to make computers usable for the masses, this issue must be addressed.

Username _ To access an E-mail account you will have to identify yourself with a username (which was provided when the account was set up) then supply the correct pass-word. These two security items prevent unauthorized access.

Utility Program _ A program that supports using the computer, an application or a development environment. Utility programs, or "utilities," that support everyday use of the computer include file management (creating, moving and renaming folders, copying and deleting files), searching for files, comparing file contents as well as performing diagnostic routines to check performance and current health of the hardware. Utilities that support a development environment can perform a myriad of tasks.

UXGA _ *Ultra extended graphics array* - A graphics standard resolution of 1600 x 1280 (2,048,000 pixels). This exceeds SXGA (1280 x 1024 = 1,310,720 pixels).

V

V2000 _ One of the three competing video formats in early 1980"s, developed by Philips in order to beat the crap out of Sony's Betamax and VHS. It has some unique features that other VCR formats didn't have - the cassette can be flipped over, just like a regular C-cassette and it also had linear stereo already in early '80s. It used a system of "Automatic" tracking with it's Dynamic Track Following system. This meant that the tracking was always 100% perfect even on still pause and picture search modes. It achieved this by having the video heads mounted on piezo electric actuators which followed the tracks as they were scanned. It is not manufactured any more. It had many other achievements, including a smaller cassette for portable devices. Unfortunately, Philips ceased the development of this format in late "80s.

VAIO _ *Video Audio Integrated Operation* Sony's trade name for its desktop and laptop PCs. In mid-1998, Sony introduced its 505G series of sub notebooks that were the first in ultra-thin Pentium portables. Numerous models from Sony and similar models from other companies soon followed.

Vandal _ A program that performs a clandestine or malicious function such as extracting a user's password or other data or erasing the hard disk. A vandal differs from a virus, which attaches itself to an existing executable program. The vandal is the full executing entity itself which can be downloaded from the Internet in the form of an ActiveX control, Java applet, browser plug-in or e-mail attachment.

Vaporware _ Software or hardware that is promised or talked about but is not yet completed - and may never be released. At times, major software vendors are criticized for intentionally producing vaporware in order to keep customers from switching to competitive products that offer more features. However, today's commercial software is more difficult than ever to program, and programmers are notorious for being terrible estimators of project time. As a result, shipping dates often slip over and over again. There is often just as large a gap between management and technical staff in software companies than there is user organizations, private or public

Variable Area _ The technical term for the analog optical soundtrack whose width varies with the sound. A Dolby analog optical soundtrack sometimes is referred to as an SVA track, for "stereo variable area." An earlier type of optical track, variable density, varied the track's photographic shading (rather than its width) with the sound.

Variable Bit Rate _ Variable bit rate (VBR) means that a bitstream (compressed or uncompressed) has a changing number of bits each second. Simple scenes can be assigned a low bit rate, with complex scenes using a higher bit rate. This enables maintaining the audio and video quality at a more consistent level.

Variable Bit Rate Recording _ Dynamically varies the bit rate depending upon picture content. Improves overall picture quality, and enables more efficient use of disc space. Future digital coding/encoding systems may be designed using a variable data rate with a separate header or sideband that contains information to program the decoder for the highest quality decompressed image.

Variable Bit-rate Compression _ While most video compression schemes are designed to produce fixed data rates irrespective of the complexity of the picture, VBR offers the possibility of fixing, or controlling, picture quality by varying the bit-rate. This allows the images that require little data, like still frames in MPEG-2, to use little data and to use more for those that need it, to maintain quality. The result is an overall saving in storage - as on DVDs - or more efficient allocation of total available bit-rate in a multichannel broadcast multiplex.

VariCam Format _ A Panasonic camcorder system that provides electronic over and under-crank recording of high definition video. The system records 720-progressive video at 60-frames per second. Using a system of frame markers in the Timecode User Bits, Varicam can provide variable frame rate recording so that in-camera motion control is possible in an electronic camcorder. Film camera systems have been able to accomplish over/under crank recording for many years, and is a staple of film cinematography.

V-box _ An interface device that can be connected to a personal computer using an RS-232 serial interface. The V-box enables the computer to control LANC-compatible video devices and translates the computer's VISCA commands into LANC protocol.

VCAP _ *Video Capable Audio Player* An audio player that can read the limited subset of video features defined for the DVD-Audio format.

VCD _ *Video Compact Disc* A CD-ROM disc that contains video and audio. A VCD is another distribution option, like VHS tapes but on Compact Disc media - so they are somewhat like DVDs, but with poorer quality. They are typically made by converting an AVI file into MPEG-1, and then burning a VCD using a video editing software program. Typically, a VCD can hold about 74 minutes (650MB) of video and stereo-quality audio. The video and audio are stored in MPEG-1 format and follow certain standards (White Book). VCD video quality is roughly the same as VHS video. VCD Video Parameters Settings Frame Size - 352x240 (NTSC) or 352x288 (PAL) Frame Rate - 29.97 frames/second (NTSC) or 25 frames/second (PAL) Video Data Rate - 1152 kbps Audio Settings - Stereo, 44.1kHz and 224kbps audio bit rate

V-chip _ Technology that blocks content. The chip reads transmitted ratings from television programs and blacks them out at the level set by the TV owner.

VCR _ *Video Cassette Recorder* also known as a VTR. A VCR can be anything from a small, portable unit to a machine used in home video recording to a large, industrial editor. The format is also subjective. The term VCR can be applied to any machine which plays a videotape. In Europe, however, VCR is a trademark for a particular ½" video format developed by Philips of The Netherlands. The system, which is not manufactured any more, used unique coaxial video cassette.

VDI _ *Video Device Interface* - An Intel standard for speeding up full-motion video performance.

Vector _ A term given to a graphic drawing, specified as a color, start and end point, and applied to line segments, type and tints.

Vector Art _ A type of computer data format used for illustration. Images are comprised of graphic shapes that scale to any size without displaying the "Jaggies". Vector art is not used to display scanned photos. Freehand and Illustrator are vector art illustration programs.

Vector Based _ Effects or graphics which are not stored in the form of pixel patterns, but are based on geometric construction regulations instead. Vector graphics can be enlarged and reduced to almost any extent without object edges showing step effects.

Vector Fonts _ Fonts that are stored as vector information - sets of lengths and angles to describe each character. This offers the benefits of using relatively little storage and the type can be cleanly displayed at virtually any size. However it does require that the type is Ripped before it can be used - requiring significant processing power if it is to be used interactively for sizing and composing into a graphic.

Vector Graphics _ Graphics that are stored as vector information - sets of lengths and angles between virtual points, to describe each shape. This offers the benefits of using relatively little storage and the shape can be cleanly displayed at virtually any size. However it does require that the image goes through a RIP before it can be used in video production. The RIP requires significant processing power if it is to be used interactively for sizing and composing into a production.

Vectorscope _ An oscilloscope that only displays the chroma information of the video signal.

Velocity _ a measure of the speed with which a key on a controller is pressed. Used to determine volume characteristics of note.

Velocity Scan Modulation _ Commonly used in TVs to increase the apparent sharpness of a picture. At horizontal dark-to-light transitions, the beam scanning speed is momentarily increased approaching the transition, making the display relatively darker just before the transition. Upon passing into the lighter area, the beam speed is momentarily decreased, making the display relatively brighter just after the transition. The reverse occurs in passing from light to dark.

Ventriculation _ Actually the generation of ventricles, i.e. hollows or chambers. In digital video technology, ventriculation refers to an effect that may occur during multiple copying of digital data. When using specific calculation regulations, minor copying faults may result which are reflected in distortions and alienation of the original picture content. Disturbances may occur in extreme cases.

Veronica _ *Very Easy Rodent Oriented Net Wide Index to Computerized Archives* - It's a system that provides access to information resources held on most of the world's gopher servers and Veronica includes references to many resources provided by other types of information servers on the Web plus it has access to Usenet archives and Telnet information worldwide.

Vertex _ A vertex is a collection of three numbers which define its position in the coordinate system. Points are the building blocks of all 3D objects. From points one can build faces, and ultimately meshes.

Vertical Blanking _ Turning off the electron beam in a CRT during the time the beam returns from the bottom of the screen to the top, after scanning each field of a picture. If vertical blanking does not occur, a diagonal "retrace" line will display from lower right to upper left of the screen.

Vertical Blanking Interval _ The blanking time at the beginning of each field. It contains equalizing pulses and vertical sync pulses.

Vertical Interval Timecode (VITC) _ Timecode information is stored on a scan line during each vertical blanking interval.

Vertical Resolution _ Also known as vertical definition. The number of distinct horizontal lines, alternately black and white, that can be seen in a TV image. Vertical resolution is fixed by the number of horizontal lines used in scanning.

Vertical Scan Frequency _ The frequency of the vertical sync pulses or vertical scans. NTSC vertical scan frequency is 59.9 Hz. PAL - 50 Hz

Vertical Sync _ This is the portion of the video signal that tells the decoder where the top of the picture is.

VESA _ *Video Electronics Standards Association* - A nonprofit member organization dedicated to facilitating and promoting personal computer graphics through improved standards for the benefit of the end-user.

Vestigial Sideband _ A method of encoding digital data onto a carrier for RF transmission.

VGA _ *Video Graphics Array* - a resolution type that uses analog signals and is only capable of 16 colors @ 640x480 and 256 colors @320x200 respectively. VGA is considered to be the lowest common denominator in graphics display

VHD _ *Video High Density* (or Video Home Disc) - a grooveless record whose video signals are read by a floating stylus.

VHDL _ Acronym for VHSIC ***Hardware Level Description Language***, an ECAD programming technique that allows designs to be carried out top down by system behavioral description

VHF_ *Very High Frequency* - Commonly referred to as 30 to 300MHz.

VHS _ *Video Home System* - The analog video tape format VHS was developed by JVC in 1977 for the consumer market and has gained comprehensive acceptance there. With the VHS system, recording is implemented with a half-inch (12.7 mm) tape. VHS is not suitable for professional use due to the low resolution.

VHS-C _ To compete with the smaller tape size of 8mm, VHS-C was created. The "C" stands for "Compact" and, although the tape width and the hub of the tape spool is the same size as VHS, the rest of the tape case is smaller. Adapters are available which allow you to use a VHS-C tape in a standard, full-size VHS videotape machine.

VHSIC _ *Very High Speed Integrated Circuit Program* - An advanced development program that is intended to develop advanced semiconductors for US Government defense purposes

Vibrato _ Pitch modulation.

Video _ Refers generally to any method using video tape or television technology to produce an image. The images are decomposed into a series of horizontal scan lines. In this way the signal can be stored, transmitted and reproduced.

Video Accelerator _ A hardware component on a display adapter that speeds up full-motion video. The primary video accelerator functions are color space conversion, which converts YUV to RGB, hardware scaling, which is used to enlarge the image to full screen and double buffering which moves the frames into the frame buffer faster.

Video Amplifier _ A low-pass amplifier with a bandwidth of 2 to 10 MHz, used to strengthen the video signal for TV transmission and reception.

Video Bandwidth _ The maximum display resolution of a video screen, measured in MHz, and calculated by horizontal x vertical resolution x refreshes/sec. For example, 800x600x60 = 28.8MHz. Traditional TV studio recording is limited to 5MHz, and TV broadcasting is limited to 3.58Mhz.

Video Camera _ A camera that takes continuous pictures and generates a signal for display or recording. It captures images by breaking down the image into a series of lines. Each line is scanned one at a time, and the continuously varying intensities of red, green and blue light across the line are filtered out and converted into a variable signal. Most video cameras are analog, but digital video cameras are also available.

Video Capture Card _ Installed inside a computer, adds the functionality needed to *digitize* analog video for use by the computer. Using a hardware or software *codec*, the capture card also compresses video in and decompresses video out for display on a television monitor.

Video Card _ A circuit board that is usually mounted inside the computer that generates signals necessary to drive, or control a specific type of monitor.

Video Carrier _ A specific frequency that is modulated with video data before being mixed with the audio data and transmitted.

Video CD _ A standard for displaying full motion pictures with associated audio on CD. The video and sound are compressed together using the MPEG 1 standard, and recorded onto a CD Bridge CD. Video CDs contains one data track recorded in CD-ROM XA Mode 2 Form 2. It is always the first track on the CD (Track 1). After the data track, video is written in one or more subsequent tracks within the same session. These tracks are also recorded in Mode 2 Form 2. The session is closed after all tracks have been written.

Video Codec _ A hardware circuit that converts analog video (NTSC, PAL, SECAM) into digital code and vice versa incorporating one of several compression techniques, such as MPEG, Indeo, Cinepak or Video1. The term may refer to only the compression and decompression processing, which can be done in software or in hardware and is separate from the A/D and D/A conversion.

Video Coder Overload _ Video coder overload is tested using rapid scene cuts, at most only a few frames apart, to stress digital compression systems by presenting them with a video signal that contains little or no temporal redundancy (frame-to-frame correlation).

Video Compression _ the method of taking a huge video file and shrinking it down so it can fit on a CD, DVD, or the web.

Video Conferencing _ Conducting a conference between two or more locations using video cameras, microphones and video monitors. The participants can be seen, as well as heard. Referred to as a "virtual conference room". Although the first videoconferencing was done with traditional analog TV and satellites, in-house room systems became popular in the early 1980s after Compression Labs pioneered digitized video systems that were highly compressed. While videoconferencing may be any number of end points communicating, the term "video chat" typically means between two end points only. Video frames are typically delivered in CIF format (352 x 288 resolution) over digital lines from 128 Kbps to 784 Kbps. ISDN has been the traditional transport for digital videoconferencing because it provides dedicated channels from end to end and allows bandwidth to be dynamically allocated in multiples of 64 Kbps. Videoconferencing over internal IP LANs and private lines has become very popular because the quality can be controlled. Using the public Internet as the transport also provides reasonable quality. During periods of congestion, systems can throttle down from 30 fps to a lower number of frames per second to eliminate jerkiness. However, the Internet is a cost-free transport, and users accept occasional blips and dropped lines.

Video Digitizer _ Also called a frame-grabber, this is an image capture device that employs a video camera attached to a circuit board in a computer, which converts the video signal into a digital file.

Video Distribution Amplifier _ A special amplifier for strengthening the video signal so that it can be supplied to a number of video monitors or other devices at the same time. Also called a distribution amplifier, or DA.

Video File Server _ A unit which uses computer hard drives rather than magnetic tape to record and playback video and audio. Because these units are "non-linear" a program may be broadcast while the end of the program is still being recorded. They are also very useful in editing television programs, since pieces of the programs can be easily moved about.

Video Filters _ A video filter is a method of changing the appearance of a video clip, like mosaic and ripple.

Video for Windows _ Microsoft's system-level Windows software architecture. Supporting the AVI movie format, Video for Windows (VfW) had to be installed separately in Windows 3.x, but was later built into Windows 95 and subsequent versions. Initially, the Video 1, RLE and Indeo compression methods were included. Windows 95 added Cinepak compression and provided drivers for Sony ViSCA VCRs and Laserdiscs. Video playback quality was rather jerky on 486s and earlier Pentiums.

Video Format _ A standard that determines the way a video signal is recorded onto videotape. Standards include - DV, Digital 8, 1-inch Type C, 3/4" U-Matic, 3/4" U-Matic, 8mm, Beta, Beta ED, Betacam, Betacam SP, D-1, DCT, D-2, D-3, D-5, Digital Betacam, Hi8, M-II, VHS, and S-VHS.

Video Game Console _ A specialized desktop computer used to play video games. The three most popular video game consoles are Sony's PlayStation 2 (PS2), Nintendo's GameCube and Microsoft's Xbox. Game software is available on CDs or DVDs, although earlier game machines used cartridges containing read only memory (ROM) chips. Although video game consoles may be powered by similar CPU chips as desktop computers, the hardware is under the entire control of their respective manufacturers, and the software is specifically geared to the machine's capabilities. There are also handheld video games such as the popular Nintendo GameBoy and earlier Sega GameGear and Atari Lynx machines. These are self-contained battery-operated devices with tiny screens for portable use.

Video Game Controller _ The input device used to control a video game. Controllers have evolved from a single joy stick with one button to devices with joy sticks, pedals and dozens of buttons.

Video Mode _ The ability of a digital still camera to capture short segments of low resolution video intended for use in e-mail or web pages.

Video Modulation _ Converting a baseband video signal to an RF signal.

Video Object Files _ There are two formats for VOB files. One for file display which are the DVD version of the MPG file format. And one for Title playback (actual DVD movie sequence). Some players support playback of standalone VOB files (ATI v1.2 Player, Win98 Media Player, PowerDVD, Xing) while others support only DVD Titles (CineMaster Player - not the engine, the actual player).

Video Overlay _ The placement of a full-motion video window on the display screen. There are various techniques used to display video on a computer's screen, depending on whether the video source has been digitized or is still in analog format.

Video Processor _ A circuit inside digital televisions that translates between video formats.

Video Projector _ A device that projects a video image onto a presentation surface.

Video RAM _ Also called "VRAM," it is the type of memory used in a display adapter. Video RAM is designed with dual ports so that it can simultaneously refresh the screen while text and images are drawn in memory. It is faster than the common DRAM or SDRAM chips used as main memory in the computer.

Video Recording _ The converting of an image, moving or still, into a video signal that can then be recorded. Video recording is usually performed by using of a video camera.

Video Server _ A computer that delivers streaming video for video on demand applications. Video servers may be computers that are specialized for this purpose. The term may just refer to the software that performs this service.

Video Signal _ The dynamic signal representing the varying levels of a video image, but not containing the sync pulses for its display. The video signal can be combined with the sync pulses into a composite signal.

Video Source _ In editing, the players running the original video tapes.

Video Stream _ Refers to any channel of video being transmitted, whether streaming or not streaming, analog or digital.

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 that hold the program streams.

Video8 _ Video 8 format has set the standards in terms of compact size, tape protection and tape length. Good picture quality and its superior HiFi sound have made it the most popular camcorder video format. Uses only metal tape. Video and audio signals are separated.

Videocassette _ A self-contained cartridge for a specific video tape recorder.

Videodisc _ This is a generic term applied to several formats that are used to convey video and audio information on a disc shaped format. The most common formats for which this name is applied are CED, Laserdisc, VHD, and possibly DVD. CED stands for Capacitance Electronic Disc. It was principally supported by RCA. The laserdisc format origins are a combination of work done by 3M Mincom and David Paul Gregg at Gauss Electrophysics. Philips, Pioneer and Sony were also part of the early development of the format. The VHD or Video High Density format is a grooveless capacitance disc. It was supported by the Victor Company of Japan. One other format made a brief appearance in Europe. The TelDec capacitive grooved disc was a joint venture of Telefunken of Germany and Decca of Great Britain. DVD does fall into the general category of videodisc but is usually not called that in an effort to avoid confusion with the laserdisc.

Video-follow-audio _ In videoconferencing, when the video source switches automatically to show the person speaking, regardless of the location.

Video-on-Demand _ or VOD, allows a user to select which program to view at their convenience and playing starts almost immediately. When used over the Internet or other network, it is commonly called *"streaming video"*. For broadcast, satellite and cable networks, it is commonly called *"pay-per-view"* and is usually confined to specific start times. For this reason, it may also be referred to as *"near video-on-demand"* or nVOD.

Videophone _ A telephone with a built-in camera and screen. The videophone was expected to materialize in the 20th century, but the communications infrastructure for universal real-time video was not available. Cable modems and DSL are expected to make videophones and videoconferencing commonplace by 2005 and thereafter.

VideoShift _ A technique used to move a video image around on the screen to prevent "burn-in", or destruction of the phosphors. A typical example would be flight schedule monitors in airport terminals, where the same image stays on the screen for a long period of time.

Videotape _ A magnetic recording medium that can store an electronic signal and is made of backing, binder, and coating. The coating is generally made of iron oxide, but may also be made of metal particle or metal evaporated coatings.

Viewing Angle _ LCD displays have some limitations as to the angle at which you can reasonably be expected to view the screen and see what's on it. The bigger the Viewing Angle the better, with 160° being the accepted maximum.

Viewing Card _ Another term for smartcard, the plastic card the size of a credit card which is inserted into your set top box. It monitors what you have subscribed to and stops you viewing the channels you are not entitled to watch. Depending on the system you choose, you may also need a viewing card to watch some of the free-to-view channels which have been scrambled for copyright reasons.

Vignette _ The transition of color from one set value of hue and saturation to another over a given distance, in vertical, horizontal or circular directions.

Viper Filmstream _ A camera system developed by Thomson that allows for the capture of RGB 22:22:22 10-bit log data directly from the CCD's. The Viper also features multiple aspect ratios and frame sizes, a mechanical shutter, and multiple frame rate support. The dual link 22:22:22 10-bit log data is transferred over a dual link HD-SDI without any electronic manipulation within the camera. This allows for external recording and full control of the coloring of the raw data at a later time.

VIR _ *Vertical Interval Reference* - A signal that was placed on line 19 of the vertical interval designed to provide a reference for luminance and chrominance levels. It isn't used much any more. Much of the television transmission world has replaced it with a reference signal for ghost canceling circuits.

Viral Programming _ Developing programs that replicate themselves. Although known more as the means to write viruses, viral programming is used to develop software agents that replicate themselves throughout the network or Internet for the benefit of the user. Such programs can detect problems in a network or be used to find the best price for merchandise when replicated and snooping around multiple shopping sites.

Virtual _ An adjective that expresses a condition without boundaries or constraints. It is often used to define a feature or state that is simulated in some fashion. For example, one of the first uses of the term was for "virtual memory," in which memory is saved to disk and swapped back and forth as needed, thus memory is essentially "simulated on disk." However, the term has become such a fashionable computer word that it may be a prefix to "virtually" any electronic or Internet-related concept or product without regard to the original meaning of the term.

Virtual Community _ A group of individuals who share a common interest via e-mail, chat rooms or newsgroups (threaded discussions). Members of a virtual community are self-subscribing.

Virtual Desktop _ An infinitely large desktop, which is provided either by a virtual screen capability or a shell program that enhances the user interface.

Virtual Display _ A display technology that creates a full screen image in a small space. It enables a handheld device, such as a pager or handheld fax machine, to simulate a desktop monitor.

Virtual Image _ In graphics, the complete graphic image stored in memory, not just the part of it that is displayed at the current time.

Virtual Keyboard _ a) A representation of a keyboard displayed on a touch screen. Tapping the "virtual keys" with a stylus or finger is the same as pressing a real key on a keyboard. **_ b)** A representation of a keyboard projected onto a flat surface such as a desktop. Using the fingers as you would a normal keyboard, tapping the keys on this image of a keyboard is picked up by an optical or electronic beam. Such a device enables PDAs and other small handhelds to create a full-size keyboard.

Virtual Memory _ A system of managing RAM and disk space through the operating system, or other software, so that a computer appears to have more memory than it actually does. Data is moved back and forth between the system's memory and disk. Since hard drive memory is often less expensive than additional RAM, it is an inexpensive way to get more memory and increase the operating speed of applications.

Virtual Monitor _ In the Macintosh, the ability to dynamically configure to any monitor type and to use multiple monitors of different types including displaying the same object across two or more screens.

Virtual Newscaster _ A machine-created person who broadcasts the news on the Internet. The virtual newscaster is available 24 hours per day to deliver any and all kinds of information and news bulletins. He or she becomes a familiar character that you identify with every time you get the news. The service behind the virtual newscaster is what really differentiates this 21st century system. Such newscasters are expected to be the brand logos of personalized news services that can search the Internet 24 hours a day to bring you personalized news and information.

Virtual Reality _ Interactive supercomputer 3D graphics. Simulates realism to users in application areas ranging from scientific visualization and visual simulation to high-definition design and digital film production.

Virtual Screen _ A viewing area that is larger than the physical borders of the screen. It allows the user to scroll very large documents or multiple documents side by side by moving the mouse pointer beyond the edge of the screen. For example, you might look through an 800x600 screen resolution into a 1,600x1,200 virtual screen.

VirtualHD Video Processing Circuitry _ Circuitry that digitally upconverts conventional sources to HDTV specifications. Includes 3:2 pulldown correction and 26-point Motion Adaptive Interpolation.

Virus _ This is an intruder program that can infect another computer program by modifying it in such a way as to self-replicate itself. It will then infect the rest of the computer system by modifying the files on it. It can hide deep inside the computer for ages and surface when a designated application is launched to infect it. It can also be transmitted over the Internet via E-mail in the form of a file attachment. After the virus code is written, it is buried within an existing program. Once that program is executed, the virus code is activated and attaches copies of itself to other programs in the system. Infected programs copy the virus to other programs. The effect of the virus may be a simple prank

that pops up a message on screen out of the blue, or it may destroy programs and data right away or on a certain date. It can lie dormant and do its damage once a year. For example, the Michelangelo virus contaminates the machine on Michelangelo's birthday. A virus cannot be attached to data. It must be attached to a runnable program that is downloaded into or installed in the computer. The virus-attached program must be executed in order to activate the virus. Macro viruses, although hidden within documents (data), are similar. It is in the execution of the macro that the damage is done. Macro viruses constitute almost all of the viruses currently in circulation. File attachments in e-mail messages are also suspect. If the attachment is an executable file, it can do anything when it is run. Examples of executables are files with extensions such as. To date, more than 60,000 types of viruses have been defined. However, 99% of the infections are from only a few hundred variants found in the wild. Almost all of them are macro viruses.

Virus Hoaxes _ Considering the speed with which messages can be copied and sent via e-mail on the Internet, pranksters love to spread phony warnings just to upset as many people as they can. Virus hoaxes such as the Good Times virus tell people that if they open their e-mail, their hard drives will be erased or some such catastrophe will occur. Another popular hoax is to send an e-mail message to Windows users telling them that a particular file has been downloaded into their computers along with instructions explaining how to delete it. Such files are actually valid Windows components, such as SULFNBK.EXE and JDBGMGR.EXE, which may be required and must be reinstalled.

Virus Scanner _ An antivirus program that searches for binary signatures (patterns) of known viruses that have attached themselves to executable programs. As new viruses are discovered, the signature database has to be updated in order for the antivirus program to be effective. Vendors generally offer downloads via the Web in order to keep current. There are two ways in which scanners work. One type scans every file each time you boot the computer and each time a file is opened. The other takes a blueprint of all existing executables one time and scans the file only when it has changed. The latter method saves time when starting or rebooting the computer since there is no processing performed. In addition, opening files is quicker, because the antivirus software does not scan the file unless it has been changed,

and it can determine if the file has been changed much faster than it can scan it for thousands of viruses.

Virus Signature _ The binary pattern of the machine code of a particular virus. Antivirus programs compare their database of virus signatures with the files on the hard disk and removable media (including the boot sectors of the disks) as well as within RAM.

VISCA _ *Video System Control Architecture* - a device control language for synchronized control of multiple video devices. The VISCA protocol is device - and platform-independent.

Visual Programming _ Developing programs with tools that allow menus, buttons and other graphics elements to be selected from a palette and drawn and built on screen. It may include developing source code by creating and/or interacting with flow charts that graphically display the logic paths and associated code.

Visual Tool _ Any program, utility, routine or function that performs an operation by dragging and dropping icons or by "drawing" the solution. Visual tools are the norm today in virtually every graphics-based (Windows, Mac, etc.) application. The term is mostly used to refer to an operation that has typically been command-line based. For example, a visual tool might simplify a programming function that would otherwise require writing lines of code.

Visualization _ Using the computer to convert data into picture form. The most basic visualization is that of turning transaction data and summary information into charts and graphs. Visualization is used in computer-aided design (CAD) to render screen images into 3-D models that can viewed from all angles and which can also be animated.

VITC _ *Vertical Interval Timecode* - Timecode information in digital form, added into the vertical blanking of a TV signal. This can be read by the video heads from tape at any time pictures are displayed, even during jogging and freeze but not during spooling. This effectively complements LTC ensuring timecode can be read at any time.

Viterbi Detection _ An Algorithm used in read channel technology that detects an entire sequence of data bits at a time and determines the most likely sequence of data bits by comparing actual sequence of data bit samples with sequences of possible data bit sample to accurately detect that data written to disk.

VLB _ *Video Loopback* - A feature in some switchers that allows a video signal to exit to another device, such as a decoder or scan-doubler, and the output of that device is then used as another input to the same switcher. This allows any switcher input to use the decoder or scan doubler, saving the cost of buying separate units.

VMG _ *Video Manager* - In DVD-Video, the information and data that controls one or more VTS and VMGM. VMG 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).

VMGI _ *Video Manager Information* - Information required to manage one or more VTS and Video Manager Menu areas. VMGI is non-realtime data located at the start of the Video Manager area.

VMI - *Volume Management Information* Identifies disc side and content type.

VOB _ *Video Object* - A VOB file is a DVD-compatible file which was not yet incorporated into a disk-format according to the DVD standard. VOB files can (in contrast to Program Streams) often be read and played back by standard DVD-software, thus, by using VOB-files, making it possible to use other storage media than the DVD and to use them similar to a DVD in a computer.

Vocoder _ A digital signal processor that imposes a changing spectral filter on a sound based on the frequency characteristics of a second sound. By taking the spectral content of a human voice and imposing it on a musical instrument, talking instrument effects can be created.

VOD _ *Video On Demand* refers to streaming files that are archived on a streaming server and may be accessed by an end-user at any time, as contrasted with live, or real-time, content.

Voice Processing _ The computerized handling of voice, which includes voice store and forward, voice response, voice recognition and text to speech technologies.

Voice Recognition _ is the conversion of spoken words into computer text. Speech is first digitized and then matched against a dictionary of coded waveforms. The matches are then converted into text as if the words were typed on the keyboard. Speaker-dependent systems require that users enunciate samples into the system in order to tune

it to their individual voices. Speaker-independent systems do not require tuning and can recognize limited vocabularies such as numeric digits and a handful of words. For example, such systems have replaced human operators for telephone services such as collect calls and credit card calls. There are three types of voice recognition applications. Command systems recognize a few hundred words and eliminate using the mouse or keyboard for repetitive commands. This is the least taxing on the computer. Discrete voice recognition systems are used for dictation, but require a pause between each word. Continuous voice recognition understands natural speech without pauses and is the most process intensive. Speaker-independent continuous systems that can handle large vocabularies are expected to become mainstream in the 2000s.

Voice Recorder _ A digital, handheld device that is used to record short voice messages. Very lightweight and typically using AAA batteries, such devices use flash memory to hold up to 100 messages or more. Messages can be retrieved sequentially or by direct access by message number.

Volatile Memory _ a Type of memory that loses its contents when the power is turned off. Computer RAM is typically volatile memory

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

Volume Descriptors _ For an ISO 9660 CD, the Volume Descriptors are a set of optional information fields recorded at the beginning of the data area on the CD. They were originally designed for the needs of CD-ROM publishers. The full set of Volume Descriptors is as follows; *System Name*: The operating system under which the application runs. This Volume Descriptor may contain a maximum of 32 a-characters, and its use is optional; *Volume Name*: This is the CD name that is displayed by your operating system when the CD is mounted. It may contain a maximum of 32 a-characters, and its use is recommended; *Volume Set Name*: If the CD you are preparing is part of a set of CDs, every CD in the set may have an identical Volume Set Name, recorded in this field. The Volume Set Name may contain a maximum of 32 d-characters,

and its use is optional; *Publisher's Name*: Identifies the publisher of the CD. Maximum 128 a-characters allowed, and its use is optional; *Data Preparer's Name*: Records the name of author of the content of the CD. Maximum 128 a-characters allowed, and its use is optional; *Application Name*: Records the name of a particular application needed to access the data on the CD, if any. Maximum 128 a-characters allowed, and its use is optional. ; *Copyright File Name*: Authors can protect their work with a copyright notice stored in a file that must be placed in the root directory. The name of this file may be recorded in the Copyright File Name Volume Descriptor. Maximum: 8+3 d-characters, and its use is optional; *Abstract File Name*: This field records the name of a file stored in the root directory that describes the contents of the CD. Maximum: 8+3 d-characters, and its use is optional; *Bibliographic File Name*: This field stores the name of a file (which may be recorded in any directory) containing bibliographic information such as an ISBN number. Maximum: 8+3 d-characters, and its use is optional; *Date Fields*: There is a Volume Descriptor field for each of four dates (Creation, Modification, Expiration, Effective), in the format: year, month, day; hour, minute, second. All these fields are optional.

Voxels _ A voxel is a "volume pixel," a cubic unit (one that has height, width, and depth) of space in a 3D world. Just as pixels are uniformly sized flat units that make up a screen, voxels are cubic pixels that can be arranged to create a 3D world. Very few games take advantage of voxels right now, as use of the technology is limited by processing and memory capacities. The PC game Outcast, also scheduled for the Dreamcast, uses a voxel engine.

VR _ *Virtual Reality* - A term that now has a number of meanings. Most commonly it refers to a virtual environment created by a computer, enabling the user to experience and interact with objects in the virtual environment. However, VR originally implied a greater sense of immersion; where the images and objects generated by the computer appear real to the user i.e. the user can touch, feel and hear the objects in the virtual environment.

VRAM _ *Video Random Access Memory* - a special high-speed type of RAM that is used temporarily to store visual information being transferred to the display hardware in a computer. Faster than normal computer RAM, the amount of VRAM also determines how many colors a given video system can display.

VRML _ Virtual reality modeling language. An ISO standard for 3-D multimedia and shared virtual worlds on the Internet.

VSB _ *Vestigial Sideband Modulation* - This is the digital modulation technique used in terrestrial transmission of digital television signals. There are several variations. Broadcasters are using an 8-VSB approach, providing about 19.5 Mbps of data. Cable companies have developed a 16-VSB system that also operates in the standard 6 MHz TV channel bandwidth, but provides nearly twice the data rate capability.

VTR _ *Video Tape Recorder* - A VTR can be anything from a small, portable unit to a machine used in home video recording to a large, industrial editor. The format is also subjective. The term VTR can be applied to any machine which plays a videotape. It refers to both, reel-to-reel and cassette recorders (e.g., VCRs).

VU meter _ *Volume unit meter* - For audio systems or recorders, a VU meter is a device that indicates the relative levels of the audio being recorded or played. It is usually calibrated to show a maximum recording level to avoid tape saturation and distortion. Zero VU is referenced to 1 milliwatt of power into a 600 ohm load. The reference level of -20 dB in this program is 0 VU.

Wafer _ A round slice of silicon crystal from which, after processing is complete dice or chips are cut

Wafer Fab _ also known as a semiconductor fabrication plant, is where all of a semiconductor's electronic components are interconnected onto a single die of silicon - from raw wafers through a series of diffusion, etching, photolithographic, and other steps to finished wafers. It must be 1,000 times cleaner than the cleanest hospital operating room because a single microscopic dust particle can render an entire die circuit useless.

Wafer Foundry _ A semiconductor manufacturer who provides wafer processing services for an external customer on a sub-contract basis

WAN _ *Wide Area Network* - A group of computers located geographically apart, nearly always belonging to a single company, and connected together by using dedicated phone lines or by satellite. The Internet is a WAN.

WAP _ *Wireless Application Protocol* allows you to use your mobile phone to access certain features of the Internet. It's limited though, because the browser isn't a full Web browser like the one you're used to on your computer and the images are somewhat condensed (well they'd have to be wouldn't they to fit on such a tiny screen). Also, the sites that are available have been specially selected.

Warmth _ A listening term. The opposite of cool or cold. The bass and low mid frequencies have depth and where the high frequencies are smooth sounding rather than being aggressive or fatiguing. In terms of frequency, generally considered the range from approx. 150Hz-400Hz. A system with the proper warmth will sound natural within this range.

Watermark _ These are bits altered within an image to create a pattern that indicates proof of ownership. Unauthorized use of a water-marked image can be traced.

Watt _ A unit of electrical power used to indicate the rate of energy produced or consumed by an electrical device. One watt is one joule of energy per second.

wav _ *waveform* - An audio data file format developed by Microsoft and IBM that can be coded in many different formats. The WAV file can be recorded at 11 kHz, 22 kHz, and 44 kHz, and in 8- or 16-bit mono and stereo. Metadata in WAV files describes the coding used. To play a WAV file requires the appropriate decoder to be supported by the playing device. This format is the standard for Windows and can be played by most applications that can support sound. It is not a compressed format, so WAV files are usually very large. It is often used as an intermediate format when recording from a CD. WAV files can be compressed as MP3 files.

Waveform _ A graphic representation of the way in which a sound wave or electrical wave varies with time.

Waveform Monitor _ A specialized oscilloscope that is used to display and evaluate video signals. The horizontal axis of a waveform monitor is driven by a time base synchronized to the video signal. The vertical axis of the display is driven by the amplitude of the video signal.

Wavelength _ The distance the sound wave travels to complete one cycle. The distance between one peak or crest of a sine wave and the next corresponding peak or crest. The wavelength of any frequency may be found by dividing the speed of sound by the frequency. (Speed of sound at sea level is 331.4 meters per second, that's 1087.42 feet per second).

Wavelet _ A compression technique in which the signal is broken down into a series of frequency bands. This can be very efficient but, as the processing is slow, it is not well suited to video. However, some early trials on D-cinema have made use of wavelet compression.

Wavelet-based Compression _ An asymmetrical image compression technique that is scalable and can provide high quality. The drawback is that it becomes more computationally expensive as the picture resolution and frame rates go up. The encode and decode are asymmetrical in that one side is a lot more expensive computationally than the other.

Wavetable _ A storage location that contains data used to generate waveforms digitally.

Wavetable Synthesis _ The technique used by MIDI for creating musical sounds by storing digitized samples of the actual instruments. It provides more realistic sound than the FM synthesis method, which generates the sound waves entirely via electronic circuits. The more notes sampled in the wavetables, the better the resulting sound recreation.

Web Application _ Software based on the Web. This can refer to almost anything Web related, including a Web browser or other client software that can access the Web. It can refer to software that runs on Web sites or software that is stored on Web sites and downloaded to the user.

Web Browser _ The program that serves as your front end to the Web on the Internet. In order to view a site, you type its address (URL) into the browser's Location field. The home page is an index to other pages on that site that you can jump to by clicking an underlined hyperlink or an icon. Links on that site may take you to other related sites. Browsers have a bookmark feature that lets you store references to your favorite sites. Instead of having to type in the URL to visit the site again, you select the bookmark. Mosaic was the browser that put the Web on the map in 1993, but by the mid 1990s, Netscape Navigator (commonly known as "Netscape") had 80% of the market. Vying for top spot, Netscape and Microsoft's Internet Explorer (I_ E) constantly added new features and functions that fragmented Web sites into competing camps. Today, IE, which is included with every Windows PC, has more than 90% of the market. Netscape is still popular among devotees, and other browsers such as Opera have their followings.

Web Bug _ A tiny transparent .gif file placed on a Web page in order to supply information to the person who put it there. Often put there by Web Servers so they can track your browsing experiences as you move from page to page or from site to site. Sounds sneaky, but don't worry. A Web Bug can't do any snooping that couldn't be done by a cookie or visible image. It just attracts bad publicity because it's hidden from view and therefore more suspicious.

Web Cam _ A camera that links to a Web site and displays frequently updated images.

Web E-mail _ This is E-mail that you send and receive by using your Web Browser instead of your normal E-mail program. The main difference between Web E-mail and normal E-mail is that the E-mail messages are not downloaded. You read them online from the Web Server.

Web Publishing _ Creating a Web site and placing it on the Web server. A Web site is a collection of HTML pages with the home page typically named INDEX.HTML. Web sites are designed using Web authoring software which provides a graphical layout capability or by hand coding in HTML or both. Distributing the site requires copying the resulting HTML pages and graphic elements into the appropriate directories on the server.

Web Rings _ These are free Internet services that provide a structure for linking Internet sites that cover the same, or similar topics.

Web Server _ A computer that delivers Web pages to browsers and other files to applications via the HTTP protocol. It includes the hardware, operating system, Web server software, TCP/IP protocols and site content (Web pages and other files). If the Web server is used internally and not by the public, it may be called an "intranet server." "Web server" may refer to just the software and not the entire computer system. In such cases, it refers to the HTTP server (IIS, Apache, etc.) that manages requests from the browser and delivers HTML documents and files in response. It also executes server-side scripts (CGI scripts, JSPs, ASPs, etc.) that provide functions such as database searching and e-commerce. A single computer system used to provide all the Internet services for a department or a small company would include the HTTP server (Web pages and files), FTP server (file downloads), NNTP server (newsgroups) and SMTP server (mail service). This system with all its services could be called a Web server. In ISPs and large companies, each of these server services could be in a separate computer or in multiple computers. A datacenter for a large public Web site could contain hundreds and thousands of Web servers. Web servers are also often used for vertical applications. Any network device, such as the print server in the example below, can contain an internal Web server (HTTP server) as the means for configuring the unit.

Web Services _ Web-based applications that dynamically interact with other Web applications using open standards that include XML, UDDI and SOAP. Such applications typically run behind the scenes, one program "talking to" another (server to server). Microsoft's .NET and Sun's Sun ONE (J2EE) are the major development platforms that natively support these standards. Web services have been initially successful in private environments where large enterprises need to exchange data with their divisions and subsidiaries or with partners and clients. In such controlled situations, agreement on the data being passed between Web service components is more easily obtained. In addition, since Web services use open standards, vendors can supply customers with client side software to add to their applications no matter what the platform. Web services over the public Internet are expected to materialize within the next several years. Using the UDDI discovery system, the goal is to register the service on the Internet, allow an application to search for and find the service and then to seamlessly exchange data with it. If the service is fee based, payment processing could be included. For global services to be successful, industries must define the details of every function that such a service must provide before it is put into operation. Web services enable software components to interact with each other around the world. In the past, this has only occasionally been realized within private networks using the industry standard CORBA and Microsoft's DCOM distributed component platforms. However, Web services use XML-based protocols that are lightweight and simpler and thus have a better chance of being widely implemented. Although the term became the hot buzzword at the turn of the century, Web services still require cooperation and agreement among people to define business transactions and processes.

Web Site _ A page or pages on the Web consisting of words, pictures, video and sound clips identified by the prefix www, meaning *World Wide Web*.

Web Space _ In simple terms, it's the "home" of any Web site you create. Lots of free Internet Service Providers offer free Web Space to their account holders, and this is where they store their Web pages for the world to access. In theory, there's nothing to stop you uploading your Web site to several ISP's free Web Space.

Web Squatting _ If someone opens an E-mail Account with an ISP just to get access to the free Webspace that they offer and upload their Web Site onto it (but then never again uses this E-mail Account because they prefer to use another) they are Web Squatting.

Web White Pages _ Web sites that provide searchable databases of individual e-mail addresses and other "people-finding" tools. They typically include residential telephone numbers and street addresses. However, unlike phone company white pages, there is no single source for this information, and you may have to try several sources. There's no guarantee that a person's e-mail address is available in any of these directories. Following are some of the popular white pages sites.

Web Yellow Pages _ Web sites that provide searchable databases of business listings. Some also include additional information such as maps, driving directions, and Web addresses. Following are some of the popular yellow pages sites.

Webcast _ The act of broadcasting streaming media content over the intranet, extranet, or the Internet. Typically refers to a live broadcast but it can also refer to an archive of a past event. The advantage to webcasting over traditional broadcasting is that a webcast can be archived and replayed at any time, by anyone, anywhere in the world. The term marries the "web" or "Internet" with "broadcasting" or video transmissions.

Webisode _ (web episode) A short audio or video presentation on the Web. Webisodes are used to promote a product, preview music, deliver news events and present all sorts of information. Flash animation is often used for Webisodes.

Webmaster _ A person responsible for the implementation of a Web site. Webmasters must be proficient in HTML as well as one or more scripting and interface languages such as JavaScript and Perl. They may also have experience with more than one type of Web server.

WebPDA _ A wireless, handheld personal digital assistant (PDA) that serves as a platform for an Internet appliance. Based on M32R/D processor, it uses the pSOSystem 2.2 operating system from Integrated Systems, Inc. and Sun's PersonalJava virtual machine.

WebTV _ Originally, a general term for a whole category of products and technologies that enable you to surf the Web on your TV. Most WebTV products today consist of a small box that connects to your telephone line and television. It makes a connection to the Internet via your telephone service and then converts the downloaded Web pages to a format that can be displayed on your TV. These products also come with a remote control device so that you can navigate through the Web. More recently, the name WebTV has been trademarked by Microsoft.

WetPC _ A waterproof body-worn computer that is used underwater to collect marine data. Packaged to withstand high underwater pressure and developed by the Australian Institute of Marine Science, it includes an eyepiece that creates a floating display in front of the diver and a five-button device shaped for the hand (the Kord Pad). The screen and Kord Pad buttons are synchronized to enable scrolling, menu selection and alphanumeric input. Back on land, data is transferred from the PC/104-based WetPC to a desktop computer via serial cable.

Wetware _ organic thinking, not done by a machine - in futuristic writing, people speculate that we will "grow" intelligence in labs, and/or be part of computer systems ourselves (really plugged in!)

White Balancing _ A color correction technique that adjusts the color levels of an image or video clip using white or gray as a color reference point. White balancing assumes that when a white object can be made to look white, the other color levels will also be accurate. White balancing is used to correct improper color levels of an image that are due to varying lighting conditions or incorrect camera settings.

White Level _ is the top end of the gray scale. It should be set below the point of any blooming in the picture and is adjusted using the Contrast control.

White Noise _ Noise with random amplitude (strength) over a wide frequency range. Used to test speakers for resonance and sensitivity. Low levels of white noise can be used to cover up other random noises, for example in an open office environment.

WIBNI _ *Wouldn't it be nice if...* A wish - usually referring to the desire for a new feature on a piece of equipment.

Wide Screen and Letterbox Titles _ As a rule, all T.V. screens and Computer monitors maintain a Width/Height aspect ratio of 4 : 3 (4 pixels wide for every 3 pixels high). However, Movie titles don't follow this rule and are usually wider, mostly conforming to a 16 : 9 aspect ratio (16 pixels wide for every 9 pixels high), but not always. Most contemporary theatrical movies are shot on film that is from 25 percent to 90 percent wider than a standard TV display. For example, a film shot in a 2.35 : 1 aspect ratio loses almost half the original picture when it is cropped to fill your TV screen, which is 1.33 : 1. The black bars at the top and bottom of the screen are normal for this format. Even though the image is smaller, you can actually see more of the picture. Certain DVD titles contain both a Wide-Screen and a Full-Screen versions on the same DVD Disc, while others only contain one of the two. Some people detest watching Wide-Screen movies while others prefer it because the image is not truncated when converted to full screen by the DVD author. Another benefit of Wide-Screen is that if the title is encoded correctly it can be viewed on a wide-screen television without the black stripes.

Wideband _ A relative term indicating a high bandwidth.

Widescreen _ A TV picture display that has a wider aspect ratio than the normal 4 : 3 and uses the normal 525 line/60 field (NTS_ C) or 625 line/50 field (PAL) scans. Widescreen 16 : 9 is also the aspect ratio used for HDTV. The widescreen aspect ratio is usually 16 : 9 but there are some intermediate schemes, such as 14 : 9. Widescreen is used on some analog transmissions as well as many digital transmissions.

Widget _ A popular word for a generic "thing" when there is no real name for it. It is often used to describe examples of made-up products along with other fictitious names; for example, "10 widgets, 5 frabbits and 2 dingits."

Width _ The size of the video display area in a horizontal direction.

Wi-Fi _ is *Wireless Fidelity* and is based on the IEEE 802.11 specifications for wireless local area networks (WLAN) developed by a working group of the Institute of Electrical and Electronics Engineers (IEEE). There are four specifications in the family: 802.11, 802.11a, 802.11b, and 802.11g. All four use the Ethernet protocol and CSMA/CA (carrier sense multiple access with collision avoidance) for path sharing.

Wild Wooly Web _ Slang for the World Wide Web. It refers to the open nature of the Web where text, images, video and Web page source code can be extracted verbatim and copied around the world in seconds without authorization. In time, many expect that the resources on the Web that are free today will be available only for a subscription fee.

Win Zip _ A Windows software tool used to compress and decompress files in an archive. Zip allows file sizes to be compressed in order to allow faster transfer of data on line. Other common terms are "zip", "pack", or "unzip" and "unpack".

Winchester Disk _ Former code name for an early IBM hard drive model, sometimes still used to refer to the technology and design of most traditional hard drives.

Window _ a) Video containing information or allowing information entry, keyed into the video monitor output for viewing on the monitor CRT. A window dub is a copy of a videotape with time code numbers keyed into the picture. **_ b)** A video test signal consisting of a pulse and bar. When viewed on a monitor, the window signal produces a large white square in the center of the picture. **_ c)** A graphical user interface that presents icons and tools for manipulating a software application. Lots of windows can be opened and then cascaded across your screen, then each one can be maximized or minimized as and when required to be viewed or worked on.

Window Dubs _ In off-line editing, the transfer of material onto a more affordable tape format with the timecode burned in on the picture. Window dubs enable you to view the timecode on a VCR without a timecode reader, and ensure frame accuracy during off-line editing when a non-frame-accurate edit controller is in use.

Windows 1 - Version 1.0 of Windows was introduced in 1985, but barely made a dent in the market. Subsequent versions (Windows 2.0, Windows/386) began to make some inroads, and a handful of companies adopted them as their operating environment. However, it wasn't until Version 3.0 that Windows had any impact. The PCs of the time were also terribly underpowered for a graphics-based interface.

Windows 2000 (2000) _ An updated version of Windows NT 4 (originally thought to be named NT 5.0). It added numerous enhancements including Plug and Play and Active Directory. Windows 2000 comes in one workstation version (Windows 2000 Professional) and three server versions, the latter supporting as much as 64GB of memory and as many as 32 CPUs in a single system.

Windows 3.0 (1990) _ "First Real Windows" Windows 3.0 put Windows on the map. Its built-in DOS extender stretched the amount of memory DOS could manage from one megabyte to 16MB, a huge increase for that time. DOS still had to be booted first, but Windows then added multitasking, cut, copy and paste between applications and centralized printer and font management, all of which were sorely lacking in DOS for years. The newly designed Program Manager user interface was widely accepted, and within a couple of years, Windows would become the major desktop operating system worldwide.

Windows 3.1 (1992) - An upgrade to Windows 95 that provided a more stable and faster environment. It added multimedia support, TrueType fonts, drag & drop commands and OLE compound documents. Windows for Workgroups was later introduced with built-in networking, allowing PCs to share data and programs when fitted with network adapters. Windows for Workgroups 3.11 was the last 3.x version. Windows 3.1 is rarely used anymore.

Windows 95 (1995) and OSR2 - Windows 95 introduced a new user interface that added more Macintosh features. It included preemptive multitasking, which allows programs to be timeshared together more effectively than in Windows 3.1, and Plug and Play, which makes adding new peripherals much easier than Windows 3.1. Unlike Windows 3.1, which was loaded after booting up with DOS, Windows 95 was a self-contained 32-bit operating system that boots with its own version of DOS. Windows 95 ran most Windows 3.x and DOS applications, and within a couple of years, support for earlier 16-bit Windows applications was dropped by most vendors. In 1996, an upgrade known as Win95B or OS Release 2 (OSR2) added support for FAT32 files and 32-bit CardBus PC cards.

Windows 98 (1998) and Second Edition - An upgrade to Windows 95 that tightly integrated the Internet Explorer Web browser with the OS. It added support for the Universal Serial Bus (US_ B) and dual monitors. In

1999, Windows 98 Second Edition fixed numerous bugs by incorporating Service Pack 1 with upgraded applications including Internet Explorer 5 and Outlook Express 5.

Windows CE _ Microsoft Windows CE is a 32-bit real-time embedded operating system (RTOS) designed from the ground up to empower the development of a new range of emerging computing appliances, including set-top boxes, digital versatile disc (DVD) drives, entertainment consoles, smart phones, highly portable and personal computing devices like handheld computers, and home appliances. Windows CE is modular, allowing use of a minimum set of software components needed to support receiver requirements. This uses less memory and improves operating system performance.

Windows ME (2000) _ An upgrade to Windows 98. ME has a shorter boot time but no longer could be booted into DOS only (DOS sessions could still be run in a Windows window).

Windows Media _ Offered by Microsoft, one of the three dominant architectures for distributing media on the Web, including streaming media. . It includes the Windows Media Player, the client component that plays Microsoft and other multimedia formats, and Windows Media Services, the set of server programs used to publish streaming audio and video over intranets and the Internet. Microsoft's DirectX programming interfaces are used by developers to integrate support for Windows Media formats in their applications.

Windows Media Player _ Delivers the most popular streaming and local audio and video formats, including ASF, WAV, AVI, MPEG, Quick-Time, and more. Windows Media Player can play anything from low-bandwidth audio to full-screen video.

Windows Media Streaming Formats _ Windows uses the ASF (Active Streaming Format) for delivering audio and video over the Web or private intranets. Microsoft's Windows Media Player and RealNetworks" RealOne player are popular client programs that play this format. Three file extensions are used for Windows streaming, and all use the same uncompressed ASF file format. If an audio file is compressed by the Windows Media Audio codec, it is given a .WMA extension. If a video file is compressed with the Windows Media Video codec, it is named a .WMV file. Any other compression method produces an

.ASF file. To accommodate earlier streaming players, .WMA and .WMV files can be renamed .ASF files. In addition to the content files, there are several playlist metafile formats that are used to hold descriptions of the content and the location of the files on remote servers. The playlist metafiles also serve as playlists for locally stored files.

Windows Metafile _ The native vector graphics file format in Windows. Windows Metafiles also can hold bitmaps and text. The original 16-bit format uses the .WMF file extension. The subsequent 32-bit format, which supports more sophisticated graphics functions, generates .EMF (Enhanced MetaFile) files. WMF and EMF files are made up of actual Windows drawing commands (GDI calls) which results in an efficient format that renders illustrations very quickly. Metafiles are also used by programs to hold data between sessions, and Windows uses it for temporary storage. The standard WMF file uses an 18-byte header followed by GDI command records. There are two additional WMF variations that place another header in front of the standard header. A Placeable Metafile uses a 22-byte header containing x-y coordinates for positioning the image on the page. A Clipboard Metafile uses an 8- or 16-byte header. In an EMF file, all header information, including Placeable and Clipboard data, is stored in the first GDI command record.

Windows NT (1993) _ Windows NT 3.5 was introduced two years before Windows 95. It was an entirely different and self-contained operating system and offered separate versions for client and server. Providing greater crash protection than Windows 3.1, its first user interface was the Windows 3.0 Program Manager. In 1996, Version 4.0 was introduced with the Windows 95 interface, but did not include Win 95"s Plug and Play capability. Windows NT Server gained significant market share as a server operating system, although the workstation version did not compete very much with other Windows versions.

Windows XP (2001) _ A client version of Windows 2000 with a redesigned user interface and .NET capability. XP comes in a Home Edition and Professional version, the latter adding more security and administrative capabilities and the capability of being run remotely. XP has improved support for digital photography, gaming, instant messaging and wireless networks. A 64-bit version is also available for Intel's Itanium CPUs.

Windoze _ A disparaging term for Windows by OS/2, Linux and other non-Windows aficionados. It reflects the long time it takes for Windows to boot up as well as the sluggishness often found in Windows applications most noticeable with earlier, slower PCs.

Winsock _ A Windows utility program that allows users connected by SLIP, PPP or other direct connections to communicate with other computers on the Internet via TCP/IP protocol.

Wintel _ *Windows & Intel* - Refers to the world's largest computer environment, which is Windows running on an Intel CPU.

Wireframe _ A wireframe is a version of a 3D model without any kind of texture mapping or shading applied. It is a model at its most basic. The edges of each polygon in the model are represented by lines, but the actual face of the polygon is transparent, thus the model appears to be constructed by wires, hence the name. Compared to surface and solid modeling, wireframe modeling is the least complex method for representing 3-D images.

Wirehead _ A person who loves to build, fix and generally tinker with electronics, much like a motorhead enjoys working with cars and engines.

WMA _ *Windows Media Audio* -A proprietary audio format owned by Microsoft, part of Microsoft's Windows Media technology.

WMF _ *Windows Metafile Format* is a vectored Windows format that may also contain a raster image. When read many applications turn the image to a raster image.

WMV _ *Windows Media Video* - developed and controlled by Microsoft. WMV is a generic name of Microsoft's video encoding solutions and doesn't necessarily define the technology what it uses - since version 7 (WMV7) Microsoft has used its own flavor of MPEG-4 video encoding technology (not very surprising, it's not compatible with other MPEG-4 technologies..). DivX video format is originally based on hacked WMV codec.

Wobble Cam _ Fashionable shaky cinematography.

Woofer _ A speaker used for low-frequency reproduction. Usually larger and heavier than a midrange or tweeter.

Word _ a) Two bytes that are processed together in a single operation. **_ b)** One sample of audio data.

Word Clock _ The precise and accurate timing of digital audio samples is critical to the correct operation of interconnected digital audio equipment. The metronome that governs sample timing is called the word clock (sometimes conjoined to word clock or abbreviated to wclk). However, word clock does more than merely beat time; it also identifies the start and end of each digital word or sample, and which samples belong to the left or right channels. Although most digital interconnect protocols are self-clocking, it is more reliable to use a dedicated line for your word clock signal. This is especially important in a multitrack environment where up to eight channels of digital data may be multiplexed on one cable.

Workstation _ A personal computer with exceptional capacity and performance capabilities for use mainly in engineering, design and audiovisual applications demanding immediate access to data and the ability to manipulate it in technically sophisticated ways.

World Wide Wait _ What many have called the Web while waiting patiently for the next page to download. The World Wide Wait is caused by any combination of a slow modem, overloaded Web server at the site you are accessing or any clog in one of the routers or switches at a national, regional or local ISP.

World Wide Web _ Specialized Internet Service allowing users to connect to remote sites with information presented as text with hypertext links. WWW documents are marked up in HTML. Cross references or hyperlinks between documents are recorded in the form of URLs. These links can often be used to refer to almost any other resource on the Internet. Graphics can be embedded into Web pages but can only be viewed using a graphical Web browser. Other applications supported are sound files, animated images, flash movies and standard movie files. The Web page, or Web document, contains text, graphics, animations and videos as well as hypertext links. The links in the page let users jump from page to page (hypertext) whether the pages are stored on the same server or on servers around the world. In the last half of the 1990s, the Web became "the" center of Internet activity, because the Web browser provided an easy, point and click interface to the largest collection of online information in the world. Ever since the Web became the focal point of the Internet, the amount of information has increased at a staggering rate. The Web has also turned into an online

shopping mall as almost every organization has added electronic commerce (e-commerce) capabilities. In addition, the Web has become a multimedia delivery system as new browser features and plug-in extensions allow for audio, video, telephony, 3-D animations and videoconferencing. Most browsers also support the Java language, which allows applications to be downloaded from the Net and run locally. The fundamental Web format is a text document embedded with HTML tags that provide the formatting of the page as well as the hypertext links (URLs) to other pages. HTML codes are common alphanumeric characters that can be typed with any text editor or word processor. Numerous Web publishing programs provide a graphical interface for Web page creation and automatically generate the HTML codes. Many word processors and publishing programs also export their documents to HTML, thus basic Web pages can be created by users without learning any coding system. The ease of page creation has helped fuel the Web's growth. Web pages are maintained at Web sites, which are computers that support the Web's HTTP protocol. When you access a Web site, you generally first link to its home page, which is an HTML document that serves as an index, or springboard, to the site's contents. In fact, the default home page for most Web sites is named INDEX.HTML. Large organizations create their own Web sites, but the actual Web servers (computer systems) that store the Web pages are often housed (co-located) at third-party facilities that provide space, power and access to the Internet. Smaller Web sites are generally hosted on servers run by their Internet service providers (ISPs). Countless individuals have developed personal Web pages as many ISPs include this service with their monthly access charge. Individuals can post their resumes, hobbies and whatever else they want as a way of introducing themselves to the world at large. The Web spawned the intranet, an in-house, private Web site for internal users. It is protected from the Internet via a firewall that lets intranet users out to the Internet, but prevents Internet users from coming in. A Web server can support non-browser applications as well and be a storehouse for any kind of file delivered to a client application via the HTTP protocol.

WORM _ **a)** An acronym for ***Write Once Read Many*** applied to a type of optical discs or CD ROM. Being optical, WORMs offer very high recording densities and are removable making them very useful for archiving.

_ **b)** It's a search utility on the Web that locates resources following user-determined guidelines. _ **c)** The name given to a certain strain of computer virus.

Wrap-around _ A video problem that occurs when the left picture information is displayed on the right side of the screen and the right picture information displays on the left side of the screen, separated by a vertical bar.

Write _ *Write to disc* or *transfer from disc to tape*, or to *print*.

Write Cache _ High speed RAM used to buffer data transfer from the host to the hard drive.

Write Coalescing _ Allows the drive to combine write commands that write data to sequential portions of the media into one operation.

Write Verify _ Immediately after writing data to the disk, a drive with the Write Verify feature will verify that it can read the data it just wrote to the disk to ensure that it will be able to retrieve it later. If the drive is unable to read the data, it writes it to another area of the disk, where it attempts to write verify it again.

WSXGA _ defines a class of SXGA displays with a width resolution sufficient to create an aspect ratio of 16:9. A WSXGA display has 1920 to 1600 horizontal pixels and 1080 to 900 vertical pixels respectively that are used to compose the image delivered by the projector.

WWW _ The "www-dot" prefix on Web addresses is placed in front of the domain name in order to provide a recognizable address for the world at large. Web addresses (URLs) are read from right to left, so that the WWW is the last component of the address. However, the WWW is quite often optional. Try typing in the name of your favorite Web site without the "www-dot" prefix and you might find it works just as well.

WXGA _ defines a class of XGA displays with a width resolution sufficient to create an aspect ratio of 16 : 9. A WXGA display has 1366 to 1280 horizontal pixels and 768 to 720 vertical pixels respectively that are used to compose the image delivered by the projector.

WYSIWYG _ ***What You See Is What You Get***. Refers to the ability to output data from the computer exactly as it appears on the screen.

X

X3 Image Sensor _ Foveon's full-color image sensor for still and video cameras that captures red, green and blue data at every pixel. Introduced in 2002, the CMOS-based X3 chip is more analogous to film than the CCD and CMOS chips in common use, because it stores all three colors (red, green and blue) in each pixel. In addition, traditional sensors capture only one third of the color per pixel, using a checkerboard-like mosaic of red, green and blue pixels that have to be interpolated by complex processing.

x86 _ Also 80x86. Refers to the Intel 8086 CPU family used in PCs, which includes the 8086, 8088, 80186, 80286, 386, 486, Pentium, Pentium MMX, Pentium Pro, Pentium II, III and 4. This is the largest installed base of computers worldwide.

Xbox _ A gaming machine from Microsoft intended to compete with Sony's PlayStation and Nintendo's GameCube. Introduced in 2001 with a 733MHz Pentium III CPU, 5x DVD drive and custom-designed graphics processor, the Xbox also includes four game controller ports, Ethernet networking and Internet connectivity. The Xbox is expected to be later expanded into a home entertainment center.

XCD _ New data CD format which uses CD Mode 2/XA to store data on CD. Basically you can fit more data on single CD than using regular Mode 1, because Mode 2 doesn't use triple error correction like Mode 1 does. Mode 2 is normally used for VideoCDs and AudioCDs.

xD-Picture Card _ *Extreme Digital Picture Card* Flash memory card standard that was co-developed by Fujifilm and Olympus. Rumored to be replacing SmartMedia which has stalled at 128MB. xD is scheduled to go as large as 8GB in a form factor the size of a postage stamp.

XGA _ *Extended graphics array* card – IBM's graphics standard that includes VGA and extended resolutions up to 1024 x 768 (interlaced 35 kHz) with 65k colors. This card uses a 15-pin HD VGA-style connector.

XGA-2 _ *Extended graphics array card, 2nd generation* – Capable of scanning from 31 to 68 kHz and resolutions up to 1600 x 1200 pixels, this card uses a 15-pin HD VGA-style connector.

XML _ *eXtensible Mark-up Language -*XML is a standard to create electronic documents on the Internet. The first application of XML is to create Web pages, similar to existing ones but more dynamic. XML is not limited to only Web pages; potential documents include forms, EDI messages, channel definition (for push technology), application descriptions, etc.

XML Parser _ A parser is a library that reads and interprets XML documents for applications.

XMODEM _ A rather slow file transfer protocol.

XR-System _ Sony's exclusive 8mm XR (eXtended Resolution) technology variably extends the luminance bandwidth for greater image detail and clarity. XR enhances Video 8 and Hi8 picture resolution by up to 10%.

XSVCD _ *Extended Super Video CD* XSVCD is same for SVCD as XVCD is for VCD -- an unofficial hack for an existing format, in this case, for SuperVideoCD. XSVCD is a regular SVCD disc, but instead of staying within SVCD bitrate limits, it pushes the bitrate limits up to the same level as DVD-Video does, up to 9.8Mbit/sec. With XSVCD you can also use full PAL/NTSC resolution instead of SVCD's regular 480x576 / 480x480 resolution. XSVCD is based on the idea that if standalone DVD player supports SVCD discs, it can read the material from the disc and in other hand, when DVD player supports regular DVD-Video discs, it must be able to read higher bitrates of MPEG-2 video as well (both, SVCD and DVD-Video are based on MPEG-2 encoding, so it is the same chip that decodes both formats). XSVCD's cons include the fact that only very small amount of video can be stored in one CD and the fact that some DVD players don't support it as it is a hack and not a real format.

XVCD _ *eXtended VideoCD* - It is not a real format unlike VideoCD and SuperVideoCD are, but instead it is a hack/extension of VideoCD format. Instead of using VideoCD's constant bitrate of 1150kbit/sec, the video can use up to 3,5Mbit/sec bitrate, providing

better video quality. Also the resolution can be higher than VideoCD's CIF resolution -- full PAL/NTSC resolution can be used instead. The problem with XVCD is the fact that it is not a real standard and therefore only some standalone DVD player can play these discs. And of course using higher bitrate causes the problem that one CD can contain less video and your movies end up taking more CDs (VCD uses 1,1Mbit/sec bitrate and if you use 3,5MBit/sec, obviously the CD can only contain appx. 1/3 of the length VCD can -- average of 25 minutes per CD).

XviD _ An open source video codec project which was launched in 2001 to continue Project Mayo's open source DivX codec. Basically a short piece of history is required in here to understand this fully. Original DivX codec was not developed from the scratch, but was just a hacked version of Microsoft's WMV video codec. This version, best known as DivX ;-) v3.11 alpha (which was the last official version of the hacked codec), quickly became ridiculously popular among videofreaks all over the world. After its success, group of people, most notably the hacker behind the DivX codec, started developing a legal version of the codec which would be a real codec instead of basic hack of existing Microsoft codec. They launched an open

source project, dubbed as Project Mayo (also known as OpenDivX) to develop this codec. After a while the codec matured, but the original developers wanted to push it further and started a company called DivXNetworks which started developing its own closed source version, based on the work of the Project Mayo. Eventually this closed source codec was released as DivX 4.Now, open source guys didn't want to abandon the work of the Project Mayo and they continued to develop the codec further and the XviD was born.

X-Y matrix _ A group of rows and columns. The X-axis is the horizontal row, and the Y-axis is the vertical column. An X-Y matrix is the reference framework for two-dimensional structures, such as mathematical tables, display screens, digitizer tablets, dot matrix printers and 2-D graphics images.

XY Zoom _ Horizontal and vertical panning feature of a digiscan telecine chain.

x-y-z coordinate system _ A 3D positioning system that includes a third (z) axis running perpendicular to the horizontal (x) and vertical (y) axes. The x-y-z coordinate system is used in computer graphics for creating models with height, width, and depth, and for moving models in 3D space.

Y _ In S-video "Y" is an abbreviation for luma of a color video signal. ("C" is for chroma.)

Y to C delay _ Relative delay or timing of the luminance channel compared to the chrominance channel in a video system.

Y, (R-Y), (B-Y) _ These are the analogue luminance (Y) and color difference signals (R-Y) and (B-Y) of component video- Y is pure luminance information whilst the two color difference signals together provide the color information. The later are the differences between a color and luminance: red - luminance and blue - luminance. The signals are derived from the original RGB source (camera or telecine).

Y, Cr, Cb _ The digital luminance and color difference signals in ITU-R 601 coding. The Y luminance signal is sampled at I3.5 MHz and the two color difference signals are sampled at 6.75 MHz co-sited with one of the luminance samples. "Cr" is the digitized version of the analog component (Red and Yellow), likewise "Cb" is the digitized version of the analog component (Blue and Yellow).

Y, U, V _ PAL luminance & color difference components. U and V are the names of the B-Y and R-Y color difference signals (respectively) when they are modulated onto a subcarrier.

Y/C _ A video interface which breaks the video signal into 2 separate channels - color and brightness (a.k.a. "chroma" and "luma") - for transmission over a wire. Y/C connections provide a superior image quality compared to standard, component home RCA connections. Also know as a S-Video connection.

Y/C _ Video signal standard with which color and brightness information is transmitted separately. (Luminance Y, chrominance C). The quality achieved by this method is better than that achieved with composite signal. The Y/C socket (Hosiden, four-pole mini DIN) was introduced as a signal interface between SVHS and HI8. The Y/C connection is frequently referred to as SVideo.

Y/C Separator _ A Y/C separator is what's used in a video decoder to separate the luma and chroma in a NTSC or PAL system. This is the first thing that any video decoder must do. The composite video signal is fed to a Y/C separator so that the chroma can then be decoded further.

YCC _ A video signal comprising luminance (Y) and two chrominance (C) components.

Year 2038 Problem _ Yet another date problem, which results from computing dates into the year 2038 and beyond in 32-bit operating systems. Unix and other C applications represent time as the number of seconds from January 1, 1970. The 32-bit variable (time - t) that stores this number overflows in the year 2038 and becomes January 1, 1970 again. However, even today, any date calculations forecasted beyond that time will be erroneous. Switching to 64-bit computing solves the problem.

Yellow Book _ The book that sets out the standard developed by Philips and Sony for the physical format of CDs to be used for information storage (CD-ROM).

YIQ _ Convenient shorthand commonly - but incorrectly - used to describe the analogue luminance and color difference signals in component video systems. Y is correct for luminance but I and Q are the two subcarrier modulation axes (I - In-phase and Q - Quadrature) used in the NTSC color coding system. Scaled and filtered versions of the R-Y and B-Y color difference signals are used to modulate the NTSC subcarrier in the I and Q axes respectively.

YUV _ Convenient shorthand commonly - but incorrectly - used to describe the analogue luminance and color difference signals in component video systems. Y is correct for luminance but U and V are, in fact, the two subcarrier modulation axes used in the PAL color coding system. Scaled and filtered versions of the B-Y and R-Y color difference signals are used to modulate the PAL subcarrier in the U and V axes respectively.

YUV12 _ Intel's notation for MPEG-1 4:2:0 YCbCr stored in memory in a planar format. The picture is divided into blocks, with each block comprising 2 x 2 samples. For each block, four 8-bit values of Y, one 8-bit value of Cb, and one 8-bit value of Cr are assigned. The result is an average of 12 bits per pixel.

YUV9 _ Intel's 4:1:0 YCbCr format. The picture is divided into blocks, with each block comprising 4 x 4 samples. For each block, sixteen 8-bit values of Y, one 8-bit value of Cb, and one 8-bit value of Cr are assigned. The result is an average of 9 bits per pixel.

YUY2 _ Intel's notation for 4:2:2 YCbCr format.

Z-buffer _ A method used by high end computers to depict depth of objects on a computer screen. The Z-buffer is implemented within the hardware rendering engine of a computer, typically used on 3D modeling computers.

Z-buffering _ A process of removing hidden surfaces using the depth value stored in the Z-buffer. Before bringing in a new frame, the rendering engine clears the buffer, setting all Z-values to "infinity". When rendering objects, the engine assigns a Z-value to each pixel : the closer the pixel to the viewer, the smaller the Z value. When a new pixel is rendered, its depth is compared with the stored depth in the Z-buffer. The new pixel is written into the frame buffer only if its depth value is less than the stored one.

Zero Crossing Point _ The point at which a signal waveform crosses from being positive to negative or vice versa.

Zero Wait State _ A wait state is a delay to the processor while it waits on slow memory. If the memory is fast enough for no delay to occur, no waiting is necessary. This is known as zero wait state.

zip _ Any files that have been compressed using a utility program called PKZIP will have this filename extension. They will need to be decompressed (or uncompressed) using the PKUNZIP utility program. WinZip does the same.

Zip Compression _ A type of file compression that decreases the total size of a file and allow larger amounts of data to be transferred in fewer bytes. A zip file typically ends with a .zip extension.

Zipper Noise _ Audible steps that occur when a parameter is being varied in a digital audio processor.

Zits _ Popular slang for short term errors in a digital picture.

ZMODEM _ The fastest and most popular file transfer protocol due to its excellent efficiency.

Zombie _ A computer system that has been covertly taken over in order to transmit phony messages that slow down service and disrupt the network. A "pulsing zombie" is when the bogus messages are sent in periodic bursts rather than continuously.

Zoom _ a) On a camera, to change the focal length to/from wide-angle and telephoto. **_ b)** In post-production, an editing filter that simulates the effect of having a camera move in very close to the subject, objects, or areas in a frame; or move away from the subject and display a wide view of the entire frame. **_ c)** A computer function of focusing down to the element or pixel for editing purposes. **_ d)** To magnify or reduce your view of the current document.

Zoomed Video Port _ Used on laptops, the ZV Port is a point-to-point uni-directional bus between the PC Card host adapter and the graphics controller, enabling video data to be transferred real-time directly from the PC Card into the graphics frame buffer.

Z-sorting _ A process of removing hidden surfaces by sorting polygons in back-to-front order prior to rendering. Thus, when the polygons are rendered, the forward-most surfaces are rendered last. The rendering results are correct unless objects are close to or intersect each other. The advantage is not requiring memory for storing depth values. The disadvantage is the cost in more CPU cycles and limitations when objects penetrate each other.

Zweiton _ A technique of implementing stereo or dual-mono audio for NTSC and PAL video. One FM subcarrier transmits a L+R signal, and a second FM subcarrier transmits a R signal (for stereo) or a second L+R signal.

# #

1 - bit color _ The lowest number of colors per pixel in which a graphics file can be stored. In 1-bit color, each pixel is either black or white.

1- bit DAC _ *1-bit Digital to Analog Converter* - A serial method of converting digital samples back into analog form for amplification. Each bit of the sample is converted into its analog weight rather than all bits of the sample converted in parallel.

1.78 _ The ratio of the horizontal size of a screen to its vertical size as 1.78 units wide to 1.0 units high. This ratio is the most standardized aspect ratio of HDTV and Widescreen SDTV. Also known as 16x9.

1.85 _ The ratio of the horizontal size of a screen to its vertical size as 1.85 units wide to 1.0 units high. This ratio is today the most common screen ratio for motion pictures.

10 - bit _ Quantizing level that results in 1024 levels of grey scale video.

1000/1001 _ When the NTSC color television system was being developed, the designers wanted to make it compatible with all of the old black and white systems that were already in people's homes. To do this, they had to make some compromises. The thing that has probably caused the most problems for our industry over the years is that the field rate was changed by 1/1.001 from 60 to 59.94 per second. This was a small enough change that the older TV's would still receive the new color broadcast and allowed for the new color information to be encoded into the broadcasted signal. This offset gives rise to "niceties" such as drop-frame timecode and audio that also has to run at the right rate. Although having analog origins, it has also been extended into the digital and HD world where 24, 30, and 60 frames/fields per second becomes 23.98, 29.97, and 59.94 to be compatible with existing NTSC formats and workflows.

1080/24p _ One of the possible formats within the DTV standard for the digital broadcasting of TV programs in the US. 1080/24p stands for the vertical resolution of 1080 lines and an aspect ratio of 16:9. The addition 24p determines the image frequency of 24 frames which corresponds to the exact image frequency commonly used in the film industry. Also, one of the HDTV standards.

1080/60i _ Refers to a standardized High Definition production format (SMPTE 274M and ITU 709) having a digital sampling structure of 1920 (H) x 1080 (V) and operating in interlaced scan mode at 60 fields per second. Often used to loosely describe a system that operates at 59.94i as well.

12 bit/32 kHz Audio _ In DV based formats. sound is recorded on 6 audio sectors (= 1/2 frame, 1 Stereo Channel). 32 kHz sampling frequency allows playback frequency of ca.16 kHz. The 12 bit mode is mainly used for audio insert and dubbing: additional stereo tracks, e.g. music or voice can be added to the original 6 audio sectors. Total 2 Stereo Channels (both at 16 kHz playback frequency).

1280x720 _ Refers to a high definition digital sampling structure of 1280 horizontally and 720 vertically. All 1280x720 images are progressively scanned (720P)

13.5 MHz _ This is the sampling frequency of luminance in SD (standard definition) digital television. It is represented by the 4 in 4:2:2. The 4 is pure nostalgia as 13.5 MHz is in the region of 14.3 MHz, the sampling rate of 4 x NTSC color subcarrier(3.58 MHz), used at the very genesis of digital television equipment.

16 bit Per Channel Color _ Used for generating the highest quality output, such as for film effects or HDTV output, a color system that stores and transmits 16 bits of information for each of the Red, Green, and Blue components, or *channels.*

16 bit, 32 bit, 128 bit etc. _ To place a single character on the screen (such as the letter "A") a computer needs to process 8 binary digits - 8 bits of data. (In other words 8 sets of 1's and zeros). A 16 bit computer - is powerful enough to deal with two letters of the alphabet simultaneously. A 32-bit computer can cope with four letters in one go and a 64 bit machine can process eight characters etc...

16 bit/48 kHz Audio _ Sound is recorded on all 12 audio sectors (= 1 frame). Three sampling frequencies: 48 kHz, 44.1 kHz and 32 kHz are possible. Maximal sampling frequency 48 kHz gives 24 kHz at playback. That's the quality of DAT with dynamic range of more than 96 dB.

16:9 _ a) This numerical sequence refers to the aspect ratio of wide-screen DTV formats for all HDTV and some SDTV (Standard-definition) video. A "16" unit width corresponds to "9" unit height proportionally, regardless of the actual size of the screen. The widescreen 16:9 numerical sequence provides a viewing experience very similar to that of 35 mm movies. Many recording and post-production devices can nowadays be switched from 4:3 to 16:9. _ **b)** DVD-Video was the first domestic format natively to support anamorphic 16:9 video. Previously, widescreen pictures would have been letterboxed within a 4:3 video frame and their proportions changed by the 16:9 TV sets, resulting in reduced vertical resolution. For viewers with 4:3 TV sets the DVD player can create a 16:9 letterboxed image within a 4:3 frame. _ **c)** As far as movies are concerned, they were originally recorded in a 4:3 aspect ratio (sometimes called Full Frame), similar to regular (non-widescreen) television sets (the true aspect ratio was 1.37:1 rather than the 1.33:1 of modern TV sets). In 1954, studios switched to the Academy Flat (1.85:1) ratio, in an effort to draw the public away from their TV sets and back into movie theaters. Academy Flat movies are wider than the old 4:3 movies, and more naturally approximate the human field of vision, which is wider than it is high. Later movies were even wider, at 2.35:1 (Panavision or Cinema-Scope). Most movies made today are filmed at 2.35:1, although there is a wide range in the available material.

16:9 Enhanced Mode _ Allows "widescreen" content to be viewed in the best possible picture quality. With "anamorphic" DVDs and HD content all scanning lines are concentrated to scan in the widescreen area only. No image quality is lost by scanning the non-usable portion ("black bars" top and bottom.)

1920x1080 _ Refers to a digital sampling structure of 1920 horizontally and 1080 vertically. 1920x1080 images can be scanned either interlaced (1080i) or progressively (1080P).

2.35 _ A highly popular widescreen motion picture film format of 2.35 units wide by 1 unit high.

22:11:11 _ Defines high definition video signals, where the luminance (Y) is sampled at 74.25 MHz and the color difference samples (R-Y,B-Y) channels are each sampled at 37.125 MHz. Note that it has become commonplace to denote HDTV Y,R-Y,B-Y also as 4:2:2. While technically incorrect, it is popularly used in a great deal of published literature.

22:22:22 _ Denotes a high definition system where all signals (R,G,B) are sampled at 74.25 MHz. Note that it has become commonplace to denote HDTV RGB also as 4:4:4. While technically incorrect, it is popularly used in a great deal of published literature.

23.98 or 23.976 _ Refers to a video image rate of 23.976 (truncated to 23.98) frames per second – which is deliberately offset from 24 frames so that a simple 3:2 process will produce the standard 59.94 fields per second interlaced video.

24 - bit color _ Type of color representation used by most computers. For each of the Red, Green, and Blue components, 8 bits of information are stored and transmitted - 24 bits in total. With these 24 bits of information, over a million different variations of color can be represented.

24p _ Refers to 24 frames-per-second, progressive scan. This has been the frame rate of motion picture film since talkies arrived. It is also one of the rates allowed for transmission in the DVB and ATSC television standards - so they can handle film without needing any frame-rate change (3:2 pull-down for 60 fields-per-second systems or running film at 25fps for 50 Hz systems). It is now accepted as a part of television production formats - usually associated with high definition 1080 lines, progressive scan. A major attraction is a relatively easy path from this to all major television formats as well as offering direct electronic support for motion picture film and D-cinema.

24p Advanced _ uses a syncopated 2:3:3:2 pulldown cadence to stuff 24 frames into 60 fields. It's ever so slightly different in its playback; the standard cadence of 2:3:2:3:2: 3:2:3... evenly intersperses the "short" and "long" frames, while 2:3:3:2:2:3:3:2... lumps two "short" frames together followed by two "long" frames. The difference is subtle, but can be seen on smooth pans or on regular in-frame motion, like the passage of a train. In my experience so far, about half the people looking at a 24p Advanced clip can see that the motion is a bit different, and half cannot. But 24p Advanced isn't intended for making

the 60i video look like film; it's designed to allow the best possible recovery of the original 24 frames. You'll note that all four original frames can be recovered from self-contained 60i frames; the green frame in 60i now contains the "extra" B and C fields and can be discarded, since all the information for B is contained in the yellow frame, and all the information for C is in the magenta frame. Extracting a true 24p clip from a 60i recording simply requires copying the raw data for the red, yellow, magenta, and blue frames into a new 24p file, skipping the green frame altogether. No decompression or recompression is required, and all recovered 24p frames retain first-generation quality. No clipping or other loss is incurred; you are still working with all your frames in their first-generation glory in 24p.

24pSf (segmented frame) _ A 24p system in which each frame is segmented - recorded as odd lines followed by even lines. Unlike normal television, so the odd and even lines are from the same snapshot in time - exactly as film is shown today on 625/50 TV systems. This way the signal is more compatible (than normal progressive) for use with video systems, e.g. VTRs, SDTI or HD-SDI connections, mixers/switchers, etc, which may also handle interlaced scans.

29.97P _ Terminology for 29.97 full frames per second digital video progressively captured.

2D Graphics _ The creation, display and manipulation of objects in the computer in two dimensions. Drawing programs and 2-D CAD programs allow objects to be drawn on an X-Y scale as if they were drawn on paper. Although 3-D images can be drawn in 2-D programs, their views are static. They can be scaled larger or smaller, but they cannot be rotated to different angles as with 3-D objects in 3-D graphics programs. They also lack the automatic lighting effects of 3-D programs. Any desired shadows must be created by the artist using color fills or gradients.

2k _ Resolution defined as 2,048 pixels wide by 1,556 high. Also the name of a color enhancement system made by DaVinci Systems that processes Standard Definition, High Definition, and high resolution images.

3 - Point Edit _ Marking three of the four points needed to place a source clip into a program and allowing the editing software to calculate the fourth point. For example, an

editor identifies an In and Out point in the source clip and an In point in the program and allows the editing software to calculate the Out point in the program. This technique allows for complex multi-track synchronized video/audio editing.

3:2 Pull – Down _ For a movie picture, 24 images per second are usually exposed in the camera and projected at the same image frequency. This, however, causes problems as soon as the picture is scanned for later video editing, since video systems use different image frequencies. NTSC works with 525 lines and 60 fields. The 3:2 pull-down is used during film scanning to receive 60 video fields from 24 film images. 3 video fields are generated from the first film image, 2 from the second, and so on. This results in (12 x 3) + (12 x 2) = 60 fields per second.

30P _ Terminology for 30 full frames per second digital video progressively captured. Often used to loosely describe a capture system that operates at 29.97P.

32 - Bit Color System _ A computer system or software capable of displaying and processing 24 bit color with 8 extra bits of information used for transparency effects or masking.

3D _ *3 Dimensional* - Refers to objects that are constructed on three planes (X, Y and Z). A 2-D drawing program can be used to illustrate a 3-D object; however, in order to automatically rotate the object as a self-contained entity, a 3-D drawing program must be used.

3D Accelerator _ Technology which enhances a computer's ability to display 3 dimensional data. Like conventional video cards, this usually comes in the form of add-in cards or chips incorporated onto a system's motherboard. The 3D accelerator market is, to a great extent, being lead by the games sector.

3D Animation _ Animating objects that appear in a three-dimensional space. They can be rotated and moved like real objects. 3-D animation is at the heart of games and virtual reality, but it may also be used in presentation graphics to add flair to the visuals.

3D Audio _ Audio reproduction that simulates sounds coming from all directions. Using signal processing techniques as well as multiple speakers, 3-D audio is used in virtual reality and home theater systems.

3D Digitizer _ A graphics input system that records x, y and z coordinates of a real object. Contact is made with various points on the object's surface by a light sensor, sound sensor, robotic instrument or pen.

3D Graphics _ A way of representing three dimensional data in two dimensional space object so that they appear to have three axes of reference: height, width, and depth (x, y, and z). 3D graphics can be used to create something as simple as a cube to something as complex as an entire feature length film such as *Final Fantasy*, *Antz* or *Toy Story*.

3D Modeling _ The ability to create three-dimensional images.

3D Pipeline _ The process of 3D graphics can be divided into three-stages: *tessellation*, *geometry*, and *rendering*. In the tessellation stage, a described model of an object is created, and the object is then converted to a set of polygons. The geometry stage includes transformation, lighting, and setup. The rendering stage, which is critical for 3D image quality, creates a two dimensional display from the polygons created in the geometry stage.

3DO _ The 3DO Interactive Multiplayer system ("3DO") was the first of the 32 bit CD-based video games consoles, arriving in late 1993 but flopped, achieving world-wide sales of less than 2 million units despite having unprecedented power and attractive development terms. It is no longer manufactured.

3ivX _ Video format based on MPEG-4 video standard with certain modifications. 3ivX can be compared pretty easily to DivX format, but in this comparison 3ivX unfortunately loses in quality. 3ivX is pretty popular format among Apple Macintosh users, because of its extensive support for Mac. In other hand, Windows users have stayed away from this format because in its original format, 3ivX had to be stored in QuickTime file structure instead of AVI file structure.

4 fsc _ Composite Digital video as used in D2 and D3 VTRs. Stands for 4 times the Frequency of Subcarrier, which is the sampling rate used.

4:1:1 _ A sampling frequency ratio used to digitize the luminance and color difference components of component video. For every 4 samples of luminance there is 1 sample each of the color difference signals, R-Y (Red minus Luminance) and B-Y (Blue minus Luminance). Luminance is sampled at 13.5MHz and color difference (R-Y, B-Y) each at 3.37MHz. With the color information sampled at half the rate of the 4:2:2 system, this is used as a more economic form of sampling where video data rates need to be reduced. Both luminance and color difference are still sampled on every line but the latter has half the horizontal resolution of 4:2:2 while the vertical resolution of the color information is maintained. 4:1:1 sampling is used in DVC-PRO (625 and 525 formats) as well as in DV and DVCAM (525/NTSC).

4:2:0 _ A sampling system used to digitize the luminance and color difference components of a video signal. The Y-signal (brightness) is registered in each line, whereas only one of the two color difference signals R-Y or B-Y are registered alternately from line to line(i.e. one line is sampled at 4:0:0, luminance only, and the next at 4:2:2). This is generally used as a more economical system than 4:2:2 sampling for 625-line formats so that the color signals have a reasonably even resolution in the vertical and horizontal directions for that format. 4:2:0 is widely used in MPEG-2 and PAL DV and DVCAM formats.

4:2:2 _ A commonly used term for a component digital video format. For every 4 samples of luminance there are 2 samples each of R-Y (Red minus Luminance) and B-Y (Blue minus luminance). The chroma resolution of formats using 4:2:2 is twice as high as that of formats with 4:2:0 or 4:1:1. The sampling frequency of Y is 13.5 MHz and that of R-Y and B-Y is each 6.75 MHz providing a maximum color bandwidth of 3.37 MHz. This fact is of particular importance in post production, e.g. when chroma keys or layering is supposed to be carried out. D9 by JVC, Digital Betacam by Sony and DVCPRO50 by Panasonic as well as MPEG-2 422 P@ML are just some of the formats using 4:2:2. The format specifies eight bits of resolution.

4:2:2:4 _ Same as 4:2:2, but with the addition of a key channel that is sampled four times for every four samples of the luminance channel.

4:2:2P@ML _ 4:2:2 Profile@Main Level. An international standard video compression profile introduced by MPEG-2. It supports 4:2:2 luminance/chrominance sampling at up to 720 × 608 pixel resolution, and data transfer rates up to 50 Mb/sec (5.96 MB/sec). This profile is used for high-quality distribution and for archiving.

4:3 _ The aspect ratio of conventional video, television, and computer screens, with "4" unit width corresponding to "3" unit height.

4:4:4 _ A sampling ratio that has equal amounts of the luminance and both chrominance channels. Can also be used for RGB sampling, the color space used in most computer programs.

4:4:4:4 _ As for 4:4:4, except that the key signal (aka *alpha channel*) is included as a fourth component, also sampled at 13.5 MHz (74.25 MHz at HD).

48sF _ *48 segmented frames* - The process of taking 24-frame progressive images and deconstructing them to produce 48 interlaced frames each with half of the number of lines of resolution to allow some HDTV processors to pass the signal and for viewing on an interlaced monitor without flicker.

4fsc _ A sampling rate locked to four times the frequency of color subcarrier (fsc). For example D2 and D3 digital VTRs sample composite video at the rate of 4 x color subcarrier frequency (i.e. 17.7 MHz PAL and 14.3 MHz NTSC).

4k _ Resolution defined as 4,096 pixels wide by 3,112 deep.

4 - point edit _ Marking all four points to place a source clip into a program. Often, the speed of the source clip has to be adjusted (speeded up or slowed down) to fit the space allowed for it in the program.

5.1 audio _ The number of channels used to create one kind of surround sound - often synonymous with Dolby Digital, though there are other formats (i.e. DTS). Instead of two speakers, 5.1 uses five speakers and a sub-woofer - considered the ".1" as it is limited in bandwidth. As far as television broadcast is concerned, for the time being, only high end HDTV programs will utilize Dolby Digital audio.

56K Modem _ A modem which transfers data at a rate of 56 Kbps which is about the equivalent of 6.8KB (Kilobytes) per second.

59.94i _ Describes an interlaced video signal where 1/2 of the total lines of the picture are captured and displayed every 1/59.94[th] of a second.

59.94P _ Describes a progressive video signal where all lines of the picture are captured and displayed every 1/59.94[th] of a second.

5C _ A copy protection technology for films and television content, named to designate

the five companies that founded it: Hitachi, Intel, Panasonic, Sony, and Toshiba. The 5C"s Digital Transmission Content Protection System (DTCP) scrambles the image data so that unlicensed copies cannot be made and uses the first all-digital connection for video equipment, i.LINK interface.

6.1 _ Multi-channel surround consisting of a front center, front right, front left, rear right, rear left, and a rear center or "back" channel. The .1 channel is a low-frequency-effects (LFE) sub-woofer channel.

601 _ Common abbreviation for ITUR 601.

60i _ Describes a interlaced video signal where 1/2 of the total lines of the picture are captured and displayed every 1/60th of a second. Often used to loosely describe a capture system that operates at 59.94i.

60P _ Describes a interlaced video signal where 1/2 of the total lines of the picture are captured and displayed every 1/60th of a second. Often used to loosely describe a capture system that operates at 59.94P.

68000 _ A family of 32-bit microprocessors from Motorola that are the CPUs in Macintoshes and a variety of workstations. It is also known as the 68K or 680x0 series.

720/60P _ Refers to a High Definition production format (SMPTE 296M) having a digital sampling structure of 1280 (H) x 720 (V) and operating at 60-frames per second progressively scanned. Often used to loosely describe a capture system that operates at 59.94P as well.

720i _ One of the resolution specs used in the HDTV. 720i stands for resolution of 1280x720 pixels and the magic little "i" means that the video is in interlaced format.

8 Bit Display _ A computer display device capable of displaying 256 (2^8) colors or shades of gray. Additional colors are simulated using a process called dithering.

8/16 Modulation _ The form of modulation block code used by DVD to store channel data on the disc.

8:8:8 _ Defines standard definition video signals, where all signals (usually R,G,B but also Y, R-Y,B-Y) are sampled at 27 MHz. Also the name of a color enhancement system made by DaVinci Systems that processes standard definition video.

8mm _ A compact videocassette format that uses magnetic tape and is eight millimeters wide. 8mm is (was) a world-wide standard

and offers high-quality recording and playback of video and audio. 8mm videotape is about the same resolution as VHS at 240 lines. However, the tape itself is only about the size of a standard audio cassette. Maximum running time is two hours in standard play and four hours in long play. It is the superior FM audio system (mono and stereo) that sets 8mm apart from the formats below

it. Today replaced by Hi 8 and Digital 8 formats.

8-VSB _ The transmission standard for digital television in the U.S., endorsed by the Federal Communications Commission in 2001. The letters indicate that it is the number 8 mode of vestigial sideband modulation. All receivers made in the U.S. are 8-VSB.

To a large extent, this book is a compilation. In the working process, I browsed dozens of internet data banks, on-line glossaries and encyclopedias, manufacturers' web sites and similar resources. All of this material was collected, compared, edited and put together in a book that, hopefully, has some coherency.

In addition to the "pure" digital topics, I also referred to some issues that don't necessarily belong to this environment, but could be interesting to the CILECT community. Consequently, there are some references to the world of audio, never before tackled in our reports, and to Video Gaming and Multimedia, issues we briefly discussed in Oaxaca but never re-visited, and also to some basic computer concepts.

It is difficult to name all of the sources from which I took information but, with my gratitude, here is a short list:

http://desktopvideo.miningco.com/library/glossary/blglossary.htm?PM=ss15_desktopvideo

www.allexperts.com/central/computing.shtml

www.computerhope.com/jargon.htm

www.computerlanguage.com

www.digitalexposure.ca/sub1.html

www.howstuffworks.com

www.infoplease.com/encyclopedia.html

www.pctechguide.com/

www.quantel.com/domisphere/infopool.nsf/html/DFB

www.webopedia.com/

www.yourdictionary.com/diction4.html#computing