Glossary

video terms and acronyms

Tektronix

Enabling Innovation

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▶ 1-9

0H – The reference point of horizontal sync. Synchronization at a video interface is achieved by associating a line sync datum, 0H, with every scan line. In analog video, sync is conveyed by voltage levels "blacker-than-black". 0H is defined by the 50% point of the leading (or falling) edge of sync. In component digital video, sync is conveyed using digital codes 0 and 255 outside the range of the picture information.

0V – The reference point of vertical (field) sync. In both NTSC and PAL systems the normal sync pulse for a horizontal line is 4.7 µs. Vertical sync is identified by broad pulses, which are serrated in order for a receiver to maintain horizontal sync even during the vertical sync interval. The start of the first broad pulse identifies the field sync datum, 0_V.

1/4" Phone – A connector used in audio production that is characterized by its single shaft with locking tip.

1/8th Mini – A small audio connector used frequently in consumer electronics.

1:1 – Either a perfectly square (9:9) aspect ratio or the field:frame ratio of progressive scanning.

100 Field Per Second – Field rate of some European proposals for a world standard for ATV (Advanced Television).

100% Amplitude, 100% Saturation – Common reference for 100/7.5/100/7.5 NTSC color bars.

100/0/75/7.5 – Short form for color bar signal levels, usually describing four amplitude levels.

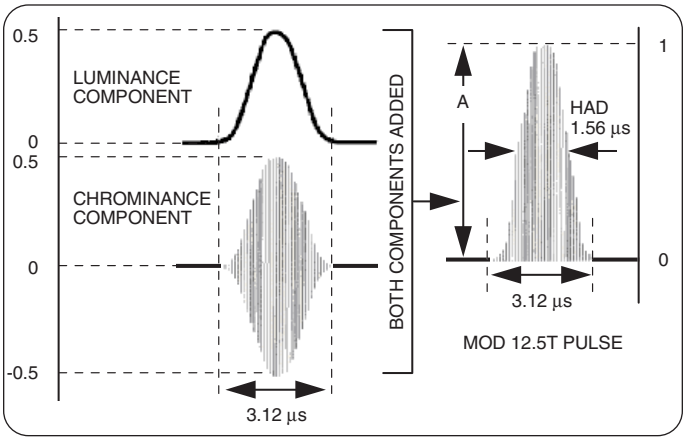
1st number: white amplitude
2nd number: black amplitude
3rd number: white amplitude from which color bars are derived
4th number: black amplitude from which color bars are derived

In this example: 75% color bars with 7.5% setup in which the white bar has been set to 100% and the black to 0%.

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

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

12.5T Sine-Squared Pulse with 3.579545 MHz Modulation – Conventional chrominance-to-luminance gain and delay measurements are based on analysis of the baseline of a modulated 12.5T pulse. This pulse is made up of a sine-squared luminance pulse and a chrominance packet with a sine-squared envelope as shown in the figure below. This waveform has many advantages. First it allows for the evaluation of both gain and delay differences with a single signal. It also eliminates the need to separately establish a low-frequency amplitude reference with a white bar. Since a low-frequency reference pulse is present along with the high-frequency information, the amplitude of the pulse itself can be normalized. The HAD of 12.5T was chosen in order to occupy the chrominance bandwidth of NTSC as fully as possible and to produce a pulse with sufficient sensitivity to delay distortion.



125M – See SMPTE 125M.

1410 NTSC Test Signal Generator – Discontinued analog circuit based Tektronix test signal generator that is used to generate full field composite analog test signals. Has been replaced by the Tektronix TSG-170A.

1450 Demodulator – Tektronix high quality demodulator that provides envelope and synchronous demodulation.

1480 Waveform Monitor – Discontinued Tektronix waveform monitor. It has been replaced by the 1780R.

16 QAM – (16 Quadrature Amplitude Modulation)

16 VSB – Vestigial sideband modulation with 16 discrete amplitude levels.

16 x 9 – A widescreen television format in which the aspect ratio of the screen is 16 units wide by 9 high as opposed to the 4 x 3 of normal TV.

1780R Waveform Monitor/Vectorscope – Tektronix microprocessor controlled combination waveform monitor and vectorscope.

1910 Digital Generator/Inserter – Tektronix VITS test signal generator.

1-H – Horizontal scan line interval, usually 64 µs for PAL or 63.5 µs for NTSC.

2:1 – Either an aspect ratio twice as wide as it is high (18:9) or the field:frame ratio of interlaced scanning.

2:2 Pull-Down – The process of transferring 24-frames/sec film format into video by repeating each frame as two video fields.

2:3 Pull-Down – See Pull-Down.

2-1/2D (Two and One-Half Dimensions) – This term refers to the kind of dimensionality (i.e., 2D, 3D) that can be created using multiplane animation. Since a layer in such animation can lie in front of one cel (or plane), or in back of another layer, the resulting effect is of a 3 dimensional world. This is a limited 3D world, however, because the layers are fixed in relation to each other. For this reason, multiplane animation is referred to as 2-1/2 dimensions. It is a very useful technique, however, even for computer graphics, because by ordering the layers in the way a painter does, you

can save the computer the need to compare objects that are in different layers (that is, compare them for purposes of hidden surface removal).

24 Frames Per Second – International standard for motion picture film shooting and projection, though film shot for television in 625 scanning-line countries is usually shot at 25 frames per second (even if not, it is transferred to television at 25 frames per second). There are moves afoot in the U.S. to increase the film frame rate to 30 for improved temporal resolution. The ImageVision HDEP system and other electronic cinematography systems use 24 frames per second. RCA once proposed an electronic cinematography system with 2625 scanning lines (2475 active), a 2:33:1 aspect ratio, and a frame rate of 23.976023 frames/sec.

24-Bit Color – Color for which each red, green and blue component stores 8 bits of information. 24-bit color is capable of representing over one million different variations of color.

25 Frames Per Second – Frame rate of television in all countries not conforming to CCIR system M (NTSC). Also the frame rate of film shot for television in those countries.

25 Hz HDTV Bitstream – A bitstream which contains only Main Profile, High Level (or simpler) video at 25 Hz or 50 Hz frame rates.

25 HZ HDTV IRD – An IRD (Integrated Receiver Decoder) that is capable of decoding and displaying pictures based on a nominal video frame rate of 25 Hz or 50 Hz from MPEG-2 Main Profile, High Level bitstreams, in addition to providing the functionality of a 25 Hz SDTV IRD.

25 Hz SDTV Bitstream – A bitstream which contains only Main Profile, Main Level video at 25 Hz frame rate.

25 Hz SDTV IRD – An IRD (Integrated Receiver Decoder) which is capable of decoding and displaying pictures based on a nominal video frame rate of 25 Hz from MPEG-2 Main Profile, Main Level bitstreams.

29.97 Frames Per Second – Frame rate of NTSC color television, changed from 30 so that the color subcarrier could be interleaved between both the horizontal line frequency and the sound carrier.

2K – A film image scanned into a computer file at a resolution of 2048 horizontal pixels per line.

2T Pulse – See the discussion on Sine-Squared Pulses.

3.579545 MHz – This is the frequency of the NTSC color subcarrier.

3:2 Pull-Down – a) The technique used to convert 24 frames per second film to 30 frames per second video. Every other film frame is held for 3 video fields resulting in a sequence of 3 fields, 2 fields, 3 fields, 2 fields, etc. **b)** A frame cadence found in video that has been telecined or converted from film to video. This cadence is produced because the frame rates for film and video are different. During the process of compression, some compression hardware recognizes this cadence and can further compress video because of it. Material which is video to start with gains no extra compression advantage. Material edited after being telecined may not gain a compression advantage.

30 Frames Per Second – Frame rate of NTSC prior to color. Frame rate of the ATSC/SMPTE HDEP standard. A potential new film standard.

30 Hz HDTV Bitstream – A bitstream which contains only Main Profile, High Level (or simpler) video at 24000/1001, 24, 30000/1001, 30, 60/1001 or 60 Hz frame rates.

30 Hz HDTV IRD – An IRD (Integrated Receiver Decoder) that is capable of decoding and displaying pictures based on nominal video frame rates of 24000/1001, 24, 30000/1001, 30, 60/1001 or 60 Hz from MPEG-2 Main Profile, High Level bitstreams, in addition to providing the functionality of a 30 Hz SDTV IRD.

30 Hz SDTV Bitstream – A bitstream which contains only Main Profile, Main Level video at 24000/1001, 24, 30000/1001 or 30 Hz frame rate.

30 Hz SDTV IRD – An IRD (Integrated Receiver Decoder) which is capable of decoding and displaying pictures based on a nominal video frame rate of 24000/1001 (approximately 23,98), 24, 3000/1001 (approximately 29,97) or 30 Hz from MPEG-2 Main Profile at Main Level bitstreams.

3D (Three Dimensional) – Either as in stereoscopic television (NHK has suggested alternating 3DTV transmissions with HDTV), or more often, when referring to ATV, relating to the three dimensions of the spatio-temporal spectrum: horizontal, vertical, and time.

3D Axis (Menu) – The 3D function that moves the image away from the center of rotation. The image can be moved along, or off any of the three axes.

3D Space – Three dimensional space is easily imagined by looking at a corner of a rectangular room. The corner is called the origin. Each edge leaving from the origin (there are three of them) is called an axis. Each axis extends infinitely in two directions (up/down, left/right, and front/back). Imagine laying long measuring sticks on each axis. These are used to locate specific points in space. On the Cubicomp, or any other graphics systems, the yardsticks are not infinitely long, and 3D space on these devices is not infinite; it is more like an aquarium.

3-Perf – A concept for saving money on film stock by shooting each 35 mm frame in an area covered by three perforations rather than four. The savings is more than enough to compensate for switching from 24 frames per second to 30. Three-perf naturally accommodates a 1.78:1 (16:9) aspect ratio and can be easily masked to the 1.85:1 common in U.S. movie theaters. It changes the shoot-and-protect concept of using theatrical film on television, however, from one in which the protected area is extended vertically to one in which the shooting area is reduced horizontally.

3XNTSC – A Zenith proposal for an HDEP scheme that would use three times as many scanning lines as NTSC (1575), but would otherwise retain NTS characteristics. It is said to allow easy standards conversion to 525- or 625-scanning line systems and to accept material shot in 1125 scanning lines in a 16:9 aspect ratio without difficulty. 3XNTSC would have 1449 active scanning lines, 2:1 interlace, a 4:3 aspect ratio, and a bandwidth of 37.8 MHz.

4:1:1 – 4:1:1 indicates that Y' has been sampled at 13.5 MHz, while Cb and Cr were each sampled at 3.375 MHz. Thus, for every four samples of Y', there is one sample each of Cb and Cr.

4:2:0 – a) A sampling system used to digitize the luminance and color difference components (Y, R-Y, B-Y) of a video signal. The four represents the 13.5 MHz sampling frequency of Y, while the R-Y and B-Y are sampled at 6.75 MHz – effectively between every other line only. **b)** The component digital video format used by DVD, where there is one Cb sample and one Cr sample for every four Y samples (i.e., 1 pixel in a 2 x 2 grid). 2:1 horizontal downsampling and 2:1 vertical downsampling. Cb and Cr are sampled on every other line, in between the scan lines, with one set of chroma samples for each two luma samples on a line. This amounts to a subsampling of chroma by a factor of two compared to luma (and by a factor of four for a single Cb or Cr component).

4:2:0 Macroblock – A 4:2:0 macroblock has four 8 x 8 blocks of luminance (Y) and two 8 x 8 blocks of chrominance (one block of Cb and one block, of Cr).

4:2:2 – a) A commonly used term for a component digital video format. The details of the format are specified in the ITU-R BT.601 standard document. The numerals 4:2:2 denote the ratio of the sampling frequencies of the single luminance channel to the two color difference channels. For every four luminance samples, there are two samples of each color difference channel. **b)** ITU-R BT.601 digital component waveform sampling standard where the luminance signal is sampled at the rate of 13.5 MHz, and each of the color difference signals, (Cr and Cb) are sampled at the rate of 6.25 MHz each. This results in four samples of the luminance signal for each two samples of the color difference signals. See ITU-R BT.601-2.

10 Bit Y Sample	10 Bit C_r Sample	10 Bit Y Sample	10 Bit C_b Sample	10 Bit Y Sample	10 Bit C_r Sample	10 Bit Y Sample	10 Bit C_b Sample

4:2:2 Profile at Main Level – An MPEG-2 profile that benefits the needs of video contribution applications. Features include high-chrominance resolution.

4:2:2:4 – Same as 4:2:2 with the addition of a key channel sampled at the same frequency as the luminance.

4:2:2p (Professional Profile) – 4:2:2p refers to a higher quality, higher bitrate encoding designed for professional video usage. It allows multiple encodings/decodings before transmission or distribution.

4:3 – The aspect ratio of conventional video, television and computer screens.

4:4:4 – A sampling ratio that has equal amounts of the luminance and both chrominance channels.

4:4:4:4 – Same as 4:2:2 with the addition of a key channel, and all channels are sampled at the same frequency as the luminance.

45 Mbps – Nominal data rate of the third level of the hierarchy of ISDN in North America. See also DS3.

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

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

4C – The four-company entity: IBM, Intel, Matsushita, Toshiba.

4fsc – Composite digital video as used in D2 and D3 VTRs. Stands for 4 times the frequency of subcarrier, which is the sampling rate used. In NTSC 4FSC is 14.3 MHz and in PAL it is 17.7 MHz.

4K – A film image scanned into a computer file at a resolution of 4096 horizontal pixels per line. 4K is considered to be a full-resolution scan of 35 mm film.

5.1 Channel Audio – An arrangement of five audio channels (left, center, right, left-surround and right-surround) and one subwoofer channel.

50 Fields Per Second – Field rate of 25 frame-per-second interlaced television.

520A Vectorscope – Discontinued Tektronix vectorscope. It has been replaced by the 1780R.

525/60 – Another expression for NTSC television standard using 525 lines/frame and 60 fields/sec.

59.94 Fields Per Second – Field rate of NTSC color television.

5C – The five-company entity: IBM, Intel, Matsushita, Toshiba, Sony.

60 Fields Per Second – Field rate of the ATSC/SMPTE HDEP standard.

60 Frames Per Second – Frame rate of Showscan and some progressively scanned ATV schemes.

601 – See ITU-R BT.601-2.

625/50 – Another expression for PAL television standard using 625 lines/frame and 50 fields/sec.

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

75% Amplitude, 100% Saturation – Common reference for 75/7.5/75/7.5 NTSC/EIA color bars.

75%/100% Bars – See Vectorscope.

8 mm – A compact videocassette record/playback tape format which uses eight millimeter wide magnetic tape. A worldwide standard established in 1983 allowing high quality video and audio recording. Flexibility, lightweight cameras and reduced tape storage requirements are among the format's advantages.

8 PSK (8 Phase Shift Keying) – A variant of QPSK used for satellite links to provide greater data capacity under low-noise conditions.

8 VSB – Vestigial sideband modulation with 8 discrete amplitude levels, used in the ATSC digital television transmission standard.

8/16 Modulation – The form of modulation block code used by DVD to store channel data on the disc. See Modulation.

▶ A

A – Abbreviation for Advanced.

A and B Cutting – A method of assembling original material in two separate rolls, allowing optical effects to be made by double printing.

A and B Rolls, Tape – Separation of material into two groups of reels (A rolls and B rolls), with alternate scenes on each reel pair (A reel and B reel) to allow transitions between reels.

A Bus – The top row of the two rows of video source select buttons associated with a given M/E.

A Bus Keyer – A keyer that appears only on top of an "A" bus background video on an M/E.

A/A (A/X/A) Roll Editing – Editing from a single source using effects to transition from the source to itself (source "A" to "A") using a picture freeze at the end of one scene to transition the start of the next scene.

A/B Roll – a) Creating fades, wipes and other transitions from one video source to another. **b)** Typically, A/B roll is an editing technique where scenes or sounds on two source reels (called Roll A and Roll B) are played simultaneously to create dissolves, wipes and other effects. On nonlinear editing systems, A/B roll refers to using two source streams (.avi,.wav,.tga and so on) to create an effect.

A/B Roll Editing – Editing from two source VCRs ("A" and "B") to a third (recording) VCR. Typically a switcher or mixer, such as the Digital Video Mixer, is used to provide transition effects between sources. Control over the machines and process can be done manually or automatically using an edit controller.

A/B Roll Linear Editing – Recording edits from two video sources, such as two VCRs to a third, to achieve transition effects. See also, B-Roll.

A/D – See A-to-D Converter.

A/V (Audio/Video) – Frequently used as a generic term for the audio and video components and capabilities in home entertainment system and related product descriptions and reviews.

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

A/V Edit – An edit that records new audio and video tracks. Also called Straight Cut.

A/V Mixer – See Audio/Video Mixer.

A:B:C Notation – The a:b:c notation for sampling ratios, as found in the ITU-R BT.601 specifications, has the following meaning: **a)** 4:2:2 means 2:1 horizontal downsampling, no vertical downsampling. Think 4 Y samples for every 2 Cb and 2 Cr samples in a scan line. **b)** 4:1:1 ought to mean 4:1 horizontal downsampling, no vertical. Think 4 Y samples for every 1 Cb and 1 Cr samples in a scan line. It is often misused to mean the same as 4:2:0. **c)** 4:2:0 means 2:1 horizontal and 2:1 vertical downsampling. Think 4 Y samples for every Cb and Cr samples in a scan line. Not only is this notation not internally consistent, but it is incapable of being extended to represent any unusual sampling ratios, that is different ratios for the Cb and Cr channels.

AAC (Advanced Audio Coding) – Part 7 of the MPEG-2 standard. It is a multichannel coding standard that defines the highest quality multichannel audio known today. It also has modes that perform extremely well for audio, speech and music at <16 kbps.

AAF (Advanced Authoring Format) – Used to describe the standardized metadata definitions that are used to exchange metadata between creative content workstations. This metadata format can contain much more information than the description implies. Nevertheless, this open standard "format" has been created primarily for post-production use. It is worth noting that the definition of AAF does provide for essence exchange as well as metadata exchange.

AAL (ATM Adaption or Adaptation Layer) – ATM protocols that map large data packets into ATM cells are defined by segmentation and reassembly protocols.

AAL5 (ATM Adaption or Adaptation Layer 5) – Connection-oriented, Unspecified Bit Rate (UBR). Least amount of error checking and retransmission.

AAU (Audio Access Unit) – See Access Unit.

A-B Rolls – Duplicate rolls of videotape information having identical time code; required to achieve effects of dissolves.

ABC – Television network financially supporting development of ACTV and pioneering the use of digital video transmission.

Aberration – A term from optics that refers to anything affecting the fidelity of the image in regards to the original scene.

ABKW – See Audio Breakaway.

Abort – Halts the program and returns control to the operator or operating system.

Absolute Time Code – Absolute time code (ATC) is generally recorded in the subcode or control track region of any digital tape. This is the code that digital tape machines use to locate specific points on a tape for autolocation or other functions. In some machines it is even used to synchronize the tape to other equipment. ATC is precisely accurate and usually conforms to the IEC standard which is easily converted to the more commercially used SMPTE time code. Unlike SMPTE, ATC always begins at zero at the beginning of a digital tape and increments one frame at a time until recording stops. Some DAT machines have the ability to function without ATC on a tape while others simply will not play a tape without it. These days almost all machines record it automatically so it will always be on every tape.

Absorption – In acoustics, the opposite of reflection. Sound waves are "absorbed" or soaked up by soft materials they encounter. Studio designers put this fact to work to control the problem of reflections coming back to the engineer's ear and interfering with the primary audio coming from the monitors. The absorptive capabilities of various materials are rated with an "Absorption Coefficient".

Absorption Coefficient – a) A measurement of the absorptive characteristics of a material in comparison to air. **b)** A measure of the relative amount of sound energy absorbed by the material when a sound strikes its surface.

ABU (Asia-Pacific Broadcasting Union) – The Asia-Pacific Broadcasting Union (ABU) is a professional association of television and radio broadcasters. It has over 100 members in 52 countries. The ABU was established in 1964 to promote the development of broadcasting in the Asia-Pacific region and to organize cooperative activities amongst its members.

AC Bias – The alternating current, usually of frequency several times higher than the highest signal frequency, that is fed to a record head in addition to the signal current. AC bias serves to linearize the recoding process and is universally used in analog recording. Generally, a large AC bias is necessary to achieve maximum long wavelength output and linearity, but a lower value of bias is required to obtain maximum short-wavelength output. The mechanism of AC bias can best be explained in terms of anhysteresis.

AC Coefficient – Any discrete cosine transform (DCT) coefficient for which the frequency in one or both dimensions is non-zero.

AC Coupled – a) AC coupling is a method of inputting a video signal to a circuit to remove any DC offset, or the overall voltage level that the video signal "rides" on. One way to find the signal is to remove the DC offset by AC coupling, and then do DC restoration to add a known DC offset (one that we selected). Another reason AC coupling is important is that it can remove harmful DC offsets. **b)** A connection that removes the constant voltage (DC component) on which the signal (AC component) is riding. Implemented by passing the signal through a capacitor.

AC Erasure – See Erasure.

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.

AC-3 – Audio Coding algorithm number 3. An audio-coding technique used with ATSC. The audio compression scheme invented by Dolby Laboratories and specified for the ATSC Digital Television Standard. In the world of consumer equipment it is called Dolby Digital.

Academy – Pertaining to specifications that meet the Academy of Motion Picture Arts and Sciences standards, such as academy leader, academy format (for film stock), academy countdown, and so forth.

ACATS (Advisory Committee on Advanced Television Service) – A group comprised almost exclusively of presidents, chief executive officers, and chairs of the boards of major broadcasting, CATV, consumer electronics, and entertainment production companies. It is currently supported by a planning subcommittee (with two advisory groups and six working parties), a systems subcommittee (with four working parties), and an implementation subcommittee (with two working parties). ACATS is an entity under the FCC, and is the approving body of advanced TV in the USA. ACTS recommended the ATSC digital TV system to the FCC in November 1995.

ACC – See Automatic Color Correction.

Acceleration – Graphic accelerators function like application-specific microprocessors whose purpose is to work in conjunction with a PC's host microprocessor to display graphics. In general, graphic accelerators control frame memory, color processing, resolution, and display speed. with the advent of the high-speed local buses and higher clock rates, accelerators operate on 32-, 64-, and 128-bit pixel data.

Access Channels – Channels set aside by a cable operator for use by third parties, including the public, educational institutions, local governments, and commercial interests unaffiliated with the operator.

Access Time – a) The time required to receive valid data from a memory device following a read signal. **b)** This is the time it takes from when a disk command is sent, until the disk reaches the data sector requested. Access time is a combination of latency, seek time, and the time it takes for the command to be issued. Access time is important in data intensive situations like hard disk recording, multimedia playback, and digital video applications. Lower access times are better. Keeping your drives in good shape with periodic de-fragging, etc. will ensure that your drive is providing the fastest access times it can.

Access Unit (AU) – a) The coded data for a picture or block of sound and any stuffing (null values) that follows it. **b)** A coded representation of a presentation unit. In the case of audio, an access unit is the coded representation of an audio frame. In the case of video, an access unit includes all the coded data for a picture, and any stuffing that follows it, up to but not including the start of the next access unit. If a picture is not preceded by a group_start_code or a sequence_header_code, the access unit begins with a picture_start_code. If a picture is preceded by a group_start_code and/or a sequence_header_code, the access unit begins with the first byte of the first of these start codes. If it is the last picture preceding a sequence_end_code in the bit stream, all bytes between the last byte of the coded picture and the sequence_end_code (including the sequence_end_code) belong to the access unit.

Access Unit Header (AU Header) – Optional information preceding an Access Unit Payload. This information consists of decoding and/or presentation time stamps. This information may be defaulted, resulting in an empty AU header. The format of the AU header is determined in the ES header.

Access Unit Payload (AU Payload) – The data field of an access unit.

Account – See Login Account.

Accumulator – One or more registers associated with the Arithmetic and Logic Unit (ALU), which temporarily store sums and other arithmetical and logical results of the ALU.

Accuracy – The closeness of the indicated value to the true value.

ACD/ACD – Application Control Data/Application Communication Data

Acicular – Needle-shaped, used to describe the shape of oxide particles.

ACLE (Analog Component Link Equipment) – A form of MAC optimized for remote broadcasting links.

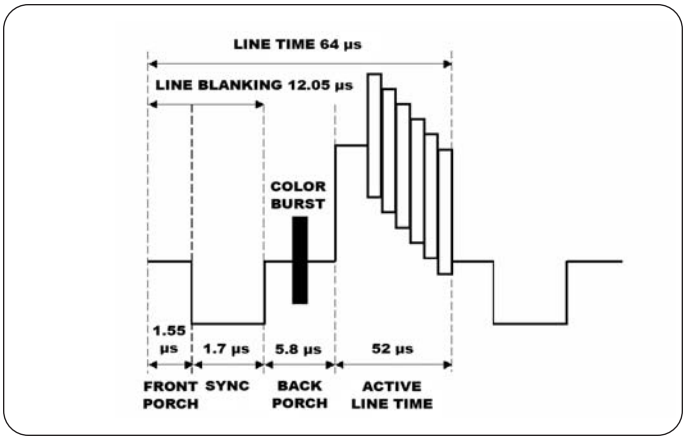
Acoustic Echo Canceller – Full-duplex audio technology; used for the elimination of acoustically-coupled return echoes within a teleconference room. Note that all microphones connected to an AEC are active at all times. Consequently, as more microphones are added, the total transmitted noise level (caused by picking up room ambient noise) increases. See also Tail Time, Echo Suppresser and Echo Return Loss Enhancement.

Acoustic Shadow – An area in which sound waves are attenuated due to the presence of an acoustic absorber or reflector in the path of the sound waves.

Acoustic Suspension – A type of speaker design using a sealed cabinet. Primarily used for low frequency enclosures, acoustic suspension designs use the air mass within the cabinet as a "spring" to help return the relatively massive speaker to the rest position. This allows heavier, longer throw drivers to be used, but results in a less efficient design requiring more amplifier power.

ACT (Anti-Comet-Tail) – This is a complex technique of preventing picture highlights from "comet-tailing" due to lack of beam current in the camera tube. (The usually colored trail behind a moving, very bright light/reflection in a picture is called a "comet-tail" since the effect looks similar to an astronomical comet.) The technique involves a special tube and circuitry to drive it. Basically, the charge due to a very bright object is never allowed to build up to an unmanageable level by discharging the target above a preset level during horizontal retrace time when the ACT action is turned on, with an increased beam current.

Active Line (PAL) – The part of the video waveform (usually 64 µs), which occupies the visible part of the signal (without sync, blanking or burst). The active line time is usually 52 µs. Also called Active Line Time or Active Video.



Active Line Time – The duration of a scanning line minus that period devoted to the horizontal blanking interval.

Active Lines – The total number of scanning lines minus those scanning lines devoted to the vertical blanking interval.

Active Picture – That portion of the ITU-R BT.601 digital picture signal between the SAV and EAV data words.

Active Picture Area – The part of a TV picture that contains actual picture as opposed to sync or other data. Vertically the active picture area is 487 lines for NTSC and 576 lines for PAL. The inactive area is called blanking.

Active Pixel Region – On a computer display, the area of the screen used for actual display of pixel information.

Active Video – The part of the video waveform that is not specified to be blanking, burst, or sync information. Most of the active video, if not all of it, is visible on the display screen.

Active Video Lines – All video lines that are not in the horizontal and vertical blanking intervals.

Active Window – On A PC, the only window that recognizes input (activity) from the keyboard and mouse; only one window is active at a time.

ActiveMovie – Microsoft's architecture for the control and processing of streams of multimedia data and software that uses this architecture to play digital video and sound. It is intended to supersede Video for Windows®.

Activity Detection – Refers to a method built into some multiplexers for detecting movement within the camera's field of view (connected to the multiplexer), which is then used to improve camera recording update rate.

ACTV (Advanced Compatible Television) – Techniques for ATV transmission developed by the DSRC, with support initially from NBC and RCA/GE Consumer Electronics (now Thomson Consumer Electronics) and with later support from such organizations as ABC and HBO. There are two ACTVs. **a)** ACTV I is a channel-compatible, receiver-compatible system utilizing many different techniques to add widescreen panels and increase horizontal and vertical resolution. Among the techniques are the filling of a Fukinuki hole, time compression, seam-elimination, spatio-temporal filtering, and quadrature modulation of the picture carrier. The last prevents direct compatibility with videotape recorders and with ordinary satellite transmission techniques. **b)** ACTV II is ACTV I plus an augmentation channel to improve resolution and sound.

Acuity – See Visual Acuity.

Adaptation – Visual process whereby approximate compensation is made for changes in the luminances and colors of stimuli, especially in the case of changes in illuminants.

Adaptation Field – Ancillary program data (especially PCR) which are uncoded and are transmitted at least every 100 ms after the TS header of a data stream (PID) belonging to a program.

Adaptation Layer Entity (AL Entity) – An instance of an MPEG-4 systems resource that processes AL PDUs associated to a single FlexMux channel.

Adaptation Layer Protocol Data Unit (AL PDU) – The smallest protocol unit exchanged between peer AL entities. It consists of AL PDU header and AL PDU payload. One or more AL PDUs with data from one or more elementary streams form the payload of a FlexMux PDU.

Adaptation Layer Protocol Data Unit Header (AL PDU Header) – Optional information preceding the AL PDU payload. It is mainly used for error detection and framing of the AL PDU payload. The format of the AL PDU header is determined when opening/configuring the associated FlexMux channel.

Adaptation Layer Protocol Data Unit Payload (AL PDU Payload) – The data field of an AL PDU.

Adaptation Layer Service Data Unit (AL-SDU) – An information unit whose integrity is preserved in transfer from one AL user to the peer AL user.

Adaptation Layer User (AL User) – A system entity that makes use of the services of the adaptation layer, typically an elementary stream entity.

Adapter – A device used to achieve compatibility between two items of audio/video equipment.

Adaptive – Changing according to conditions.

Adaptive Bit Allocation – The allocation of more bits to image areas of high activity which does not lend itself to all types of video compression techniques, especially when interframe sampling is used.

Adaptive Compression – Data compression software that continually analyzes and compensates its algorithm, depending on the type and content of the data and the storage medium.

Adaptive Differential Pulse Code Modulation – a) A compression technique that encodes the predictive residual instead of the original waveform signal so that the compression efficiency is improved by a predictive gain. Rather than transmitting PCM samples directly, the difference between the estimate of the next sample and the actual sample is transmitted. This difference is usually small and can thus be encoded in fewer bits than the sample itself. **b)** Differential pulse code modulation that also uses adaptive quantizing; an audio coding algorithm which provides a modest degree of compression together with good quality. **c)** A technique for compressing the transmission requirements of digital signals. ADPCM has been used by ABC between New York and Washington to allow NTSC transmission on a 45 Mbps (DS3) telephone company data transmission circuit. **d)** A pulse code modulation system typically operating at a high sampling rate whereby coding is based on a prior knowledge of the signal to be processed (i.e., greater than, equal to, or less than the previous sample). The system is adaptive in that digital bits of code signify different sizes of signal change depending on the magnitude of the signal.

Adaptive Emphasis – An ATV technique for improving detail of dark parts of the picture by increasing their level. If a complementary de-emphasis is performed at the receiver, noise can be reduced. Dolby B noise reduction (the form of Dolby noise reduction most common in consumer cassette recorders) is a classic example of complementary adaptive emphasis.

Adaptive Filter – A filter which changes its parameters on a continual basis to guarantee a constant or desired output value.

Adaptive Multichannel Prediction – Multichannel data reduction exploiting statistical inter-channel dependencies in audio.

Adaptive Noise Allocation – Variable assignment of coding noise in audio frequency bands based on a psychoacoustic model.

Adaptive Quantization – Varying quantization values are applied based on some model analysis of the data characteristics.

Adaptor – A device that allows an ordinary NTSC television to receive pictures from a non-receiver-compatible ATV system.

ADC – See A-to-D Converter.

Add Edit – An edit added between consecutive frames in a sequence segment with the timeline. An add edit separates segment sections so the user can modify or add effects to a subsection of the segment.

Added Calibrator – This is a feature of some waveform monitors which allows an internal 1 volt calibrator signal to be used as a reference for amplitude measurements.

Adder – Device that forms, as output, the sum of two or more numbers presented as inputs.

Additive – Any material in the coating of magnetic tape other than the oxide and the binder resins; for example, plasticizers (materials used to soften an otherwise hard or brittle binder), lubricants (materials used to lower the coefficient of friction of an otherwise high-friction binder), fungicides (materials used to prevent fungus growth), dispersants (to uniformly distribute the oxide particles) or dyes.

Additive Color – Color produced by "adding" colors, usually the combination of red, green and blue.

Additive Color System – Color specification system in which primary colors are added together to create a desired color. An example is the red/green/blue (RGB) system. Additive systems are generally associated with light emitting devices (CRTs).

Additive Mix – A mix wherein the instantaneous video output signal is equal to the weighted sum of the input video signals. Unless otherwise specified, "mix" is taken to mean "additive mix".

Address – Number that indicates the position of a word in the memory.

Address Bus – Set of wires (typically 32) used to transmit addresses, usually from the microprocessor to a memory or I/O device.

Address Decoding – Process of selecting a specific address or field of addresses to enable unique devices.

Address Dial – See SCSI Address Dial.

Addressable – Capable of being activated or accessed remotely by signals sent from a cable system's headend (usually refers to descramblers and other set-top boxes.)

Addressability – The capability to selectively and remotely activate, disconnect or descramble television signals in individual subscribers' homes. A functionality of pay-per-view systems.

Addressing Modes – Various methods of specifying an address as part of an instruction. See Direct Addressing, Indirect Addressing, Immediate Addressing and Indexed Addressing.

Adhesion – The degree to which the coating adheres to the base film. Anchorage may be checked by measuring the force required to separate the coating from the base film by means of a specially designed plow blade or, more simply, by determining whether the coating can be peeled from the base film by means of ordinary pressure-sensitive adhesive tape.

ADIF (Audio Data Interchange Format) – ADIF is just one header at the beginning of the AAC file. The rest of the data is just the same as a raw Advanced Audio Coding (AAC) file.

Adjacent Channel – A television transmission channel immediately adjacent to an existing channel. For example, channel 3 is adjacent to channels 2 and 4. There are three exceptions to what might otherwise be considered adjacent channels: there is a small gap between channels 4 and 5, there is a large gap between channels 6 and 7, and there is an enormous gap between channels 13 and 14. Adjacent channels figure into ATV in two ways. **a)** First, it is currently illegal to broadcast on adjacent channels in a single location. Some ATV proponents feel that augmentation channels might someday be allowed to be placed in adjacent channels. If half-size (3 MHz) or smaller augmentation channels are used, all current broadcasters could then be allowed an augmentation channel. Some proponents feel the use of a low power digital augmentation channel will allow adjacent channels to be used without interference. **b)** Second, some ATV proposals require that the augmentation channel be adjacent to the transmission channel or require a larger than normal transmission channel, thus occupying a channel and one of its adjacent channels.

Adjust input video timing to match a reference video input. Eliminates the need for manual timing adjustments.

Administrator – See System Administrator and Network Administrator.

ADO (Ampex Digital Optics) – Trade name for digital effects system manufactured and sold by Ampex.

ADPCM – See Adaptive Differential Pulse Code Modulation.

ADR (Automatic Display Replacement) – The process of looping playback of a selected region in a sequence and automatically recording multiple replacement takes.

ADSL – See Asymmetrical Digital Subscriber Line.

ADSR (Attack, Decay, Sustain and Release) – These are the four parameters found on a basic synthesizer envelope generator. An envelope generator is sometimes called a transient generator and is traditionally used to control the loudness envelope of sounds, through some modern designs allow for far greater flexibility. The Attack, Decay, and Release parameters are rate or time controls. Sustain is a level control. When a key is pressed, the envelope generator will begin to rise to its full level at the rate set by the attack parameter, upon reaching peak level it will begin to fall at the rate set by the decay parameters to the level set by the sustain control. The envelope will remain at the sustain level as long a the key is held down. Whenever a key is released, it will return to zero at the rate set by the release parameters.

ADTS (Audio Data Transport Stream) – ADTS headers are present before each Advanced Audio Coding (AAC) raw_data_block or block of 2 to 4 raw_data_blocks. Until the MPEG revision from December 2002 for MPEG-4 AAC ADTS headers, this was basically the same as a MP3 header, except that the emphasis field was not present for MPEG-2 AAC, only for MPEG-4 AAC.

ADTV (Advanced Definition Television) – A term sometimes used for both EDTV and HDTV.

Advance – The separation between a point on the sound track of a film and the corresponding picture image.

Advanced Coding Efficiency (ACE) – The ACE profile supports coding efficiency for both rectangular and arbitrary shaped objects. It is suitable for applications such as mobile broadcast reception, acquisition of image sequences, and other applications where high coding efficiency is requested and a small footprint isn't the prime concern.

Advanced Encoder – A device that changes RGB or DAV into NTSE utilizing some form or forms of pre-filtering to reduce or eliminate NTSC artifacts. Some advanced encoders also offer image enhancement, gamma correction, and the like.

Advanced Real-Time Simple (ARTS) – The ARTS profile provides advanced error resilient coding techniques of rectangular video objects using a back channel and improved temporal resolution stability with the low buffering delay. Use it for real-time coding applications, such as the videophone, teleconferencing and remote observation.

Advanced Television Systems Committee (ATSC) – The US-based organization that is defining the high definition television standard for the U.S.. A sort of NTSE for ATV. It is comprised of three technology groups and a number of smaller committees. **T1 Group** is studying receiver-compatible improved NTSC. **T2 Group** is studying non-receiver-compatible 525 scanning line production, distribution, and display systems. **T3 Group** is studying HDTV.

Advanced TV – Although sometimes used interchangeably, advanced and high-definition television (HDTV) are not one and the same. Advanced television (ATV) would distribute wide-screen television signals with resolution substantially better than current systems. It requires changes to current emission regulations, including transmission standards. In addition, ATV would offer at least two-channel, CD-quality audio.

AEA (American Electronics Association) – An organization of manufacturers more associated with computers and communications than is the EIA. The AEA has established an ATV Task Force, the members of which include: AT&T, Apple Computer, Hewlett-Packard, IBM and Motorola.

AEC – See Acoustic Echo Canceller.

AES (Audio Engineering Society) – The official association of technical personnel, scientists, engineers and executives in the audio field. Of potential interest in electronic production are the following: SC-2, Subcommittee on Digital Audio; SC-3, Subcommittee on the Preservation and Restoration of Audio Recording; and SC4, Subcommittee on Acoustics.

AES/EBU – a) Informal name for a digital audio standard established jointly by the Audio Engineering Society and European Broadcasting Union organizations. **b)** The serial transmission format standardized for professional digital audio signals (AES3-1992 AES Recommended Practice for Digital Audio Engineering – Serial Transmission Format for Two-Channel Linearly Represented Digital Audio Data). **c)** A specification using time division multiplex for data, and balanced line drivers to transmit two channels of digital audio data on a single twisted-pair cable using 3-pin (XLR) connectors. Peak-to-peak values are between 3 and 1-V with driver and cable impedance specified as 110 ohms.

AES/EBU Digital Audio – Specification titled "AES recommended practice for digital audio engineering – Serial transmission format for two channel linearity represented digital audio data". AES/EBU digital audio standard that is the result of cooperation between the US based AES and the European based EBU.

AES3 – See AES/EBU Digital Audio.

AF – See Adaptation Field.

AFC – See Automatic Frequency Control.

AFC/Direct – See Waveform Monitors.

AFI (Authority and Format Identifier) – Part of network level address header.

AFL (After Fade Listen) – Used in mixing boards to override the normal monitoring path in order to monitor a specific signal at a predefined point in the mixer. Unlike PFL, the AFL signal definition is taken after the fader of a channel or group buss such that the level of the fader will affect the level heard in the AFL monitor circuit. AFL is sometimes also taken after the pan pot which also allows the engineer to monitor the signal with the pan position as it is in the mix. AFL is a handy way to monitor a small group of related instruments by themselves with all of their eq, level, and pan information reproduced as it is in the overall mix. An AFL circuit that includes pan information is often called "solo" or "solo in place" depending upon who builds the mixer.

AFM (Audio Frequency Modulation) – The most common form of audio recording found in most consumer and professional video recording decks, especially in VHS and 8 mm recorders. AFM audio is limited to dynamic range and frequency response, and can include stereo and multitrack audio.

AFNOR (Association Francaise de Normalisation) – French standards body.

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. The A-frame is the only frame in the sequence where a film frame is completely reproduced on one complete video frame. Here is the full sequence. (The letters correspond to the film frames.) A-frame = video fields 1&2, B-frame = video fields 1&2&1, C-frame = video fields 2&1, D-frame = video fields 2&1&2.

Aftertouch – MIDI data sent when pressure is applied to a keyboard after the key has been struck, and while it is being held down or sustained. Aftertouch is often routed to control vibrato, volume, and other parameters. There are two types: the most common is Channel Aftertouch which looks at the keys being held, and transmits only the highest aftertouch value among them. Less common is Polyphonic Aftertouch, which allows each key being held to transmit a separate, independent aftertouch value. While polyphonic aftertouch can be extremely expressive, it can also be difficult for the unskilled to control, and can result in the transmission a great deal of unnecessary MIDI data, eating bandwidth and slowing MIDI response time.

AFV – See Audio Follow Video.

AFX (Animation Framework Extension) – AFX is an integrated toolbox that uses existing MPEG-4 tools to create powerful synthetic MPEG-4 environments. This collection of interoperable tool categories (with each tool providing a functionality, such as an audiovisual stream) works together to produce a reusable architecture for interactive animated content.

AGC – See Automatic Gain Control.

AI (Amplitude Imbalance) – The purpose of the AI measurement is to assess the QAM distortions resulting from amplitude imbalance of I and Q signals.

AIFF (Audio Interchange File Format) – This is the format for both compressed and uncompressed audio data.

AIFF-C (Audio Interchange File Format-Condensed) – A sampled-sound file format that allows for the storage of audio data. This format is primarily used as data interchange format but can be used as a storage format as well. OMF Interchange includes AIFF-C as a common interchange format for non-compressed audio data.

Air Tally – The ability of a switcher console to indicate to an operator which video sources and keys are on air at any given time. Ampex switchers have "true" air tally in that they sense actual presence of sources.

AIT (Application Information Table) – Provides information about the activation state of service bound applications.

A-Law – A pulse code modulation (PCM) coding and companding standard that is used in Europe for digital voice communications.

ALC – See Automatic Level Control.

ALC (Automatic Light Control) – A part of the electronics of an automatic iris lens that has a function similar to backlight compensation in photography.

Algorithm – a) A set of rules or processes for solving a problem in a finite number of steps. In audio, video and data coding, the step-by-step procedure (often including repetition) which provides suitable compression and/or encryption for the specific application. When used for compression, this mathematical process results in a significant reduction in the number of bits required for transmission and may be either lossless or lossy.
b) Step-by-step procedure for the solution to a problem. First the problem is stated and then an algorithm is devised for its solution.

Alias, Aliasing – Something other that what it appears to be. Stairsteps on what should be a smooth diagonal line are an example of spatial alias. Wagon wheels appearing to move backwards are an example of temporal alias. Aliases are cause by sampling and can be reduced or eliminated by pre-filtering, which can appear to be a blurring effect. Defects in the picture typi-cally caused by insufficient sampling (violation of the Nyquist sampling rate) in the analog to digital conversion process or poor filtering of digital video. De-fects are typically seen as jaggies on diagonal lines and twinkling or brightening in picture detail. Examples are: Temporal Aliasing – such as rotating wagon wheel spokes appearing to rotate in the reverse direction. Raster Scan Aliasing – such as sparkling or pulsing effects in sharp horizontal lines. Stair-Stepping – stepped or jagged edges in diagonal lines or the diagonal parts of a letter.

Alignment – Most commonly, Head Alignment, but also used to describe the process of adjusting a recorder's Bias and Equalization for optimum results from a specific tape.

Alignment Jitter – The variation in time of the significant instants (such as zero crossings) of a digital signal relative to a hypothetical clock recovered from the signal itself. This recovered clock will track in the signal up to its upper clock recovery bandwidth, typically 1 kHz to 100 kHz. Measured alignment jitter includes those terms above this frequency. Alignment jitter shows signal-to-latch clock timing margin degradation. The allowed specification for SMPTE 292 is 0.2 unit intervals.

Alpha – See Alpha Channel and Alpha Mix.

Alpha Channel – The alpha channel is used to specify an alpha value for each color pixel. The alpha value is used to control the blending, on a pixel-by-pixel basis, of two images:

new pixel = (alpha)(pixel A color) + 1 – (alpha)(pixel B color)

Alpha typically has a normalized value of 0 to 1. In a computer environment, the alpha values can be stored in additional bit planes of frame-buffer memory. When you hear about 32-bit frame buffers, what this really means is that there are 24 bits of color, 8 each for red, green, and blue, along with an 8-bit alpha channel. Also see Alpha Mix.

Alpha Map – The representation of the transparency parameters associated to a texture map.

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 pixels of the little box appear in the frame buffer, an alpha number of "1" is put in the alpha channel. Wherever they don't appear, an alpha number of "0" is placed. 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. Of course, it doesn't matter if a "1" or a "0" is used, but you get the point.

Alpha Plane – Image component providing transparency information.

Alphanumeric – Set of all alphabetic and numeric characters.

ALU – See Arithmetic and Logic Unit.

AM – A form of modulation where the level of the baseband information affects the level of the carrier. See Amplitude Modulation.

A-MAC – A MAC (Multiplexed Analog Component) with audio and data frequency multiplexed before modulation. See also MAC.

Ambient – Natural, or surrounding light in a clip.

Ambient Lighting – Light that emanates from no particular source, coming from all directions with equal intensity.

Ambient Sound – A representative sample of background audio (such as a refrigerator hum or crowd murmur) particular to a shooting location. Ambient sound is gathered in the course of a production to aid the sound editor in making cuts or filling in spaces between dialog. Also called Room Tone.

American Television and Communications – See ATC.

A-Mode – A linear method of assembling edited footage. In A-mode, the editing system performs edits in the order in which they will appear on the master, stopping whenever the edit decision list (EDL) calls for a tape that is not presently in the deck. See also B-Mode, C-Mode, D-Mode, E-Mode, Source Mode.

A-Mode Edit – An editing method where the footage is assembled in the final scene order. Scene 1, scene 2, etc.

Amplitude – a) The height of a waveform above or below the zero line. The maximum value of a varying waveform. **b)** The maximum distance an oscillating body (e.g., a pendulum) or wave travels from a mean point.

Amplitude Modulation (AM) – a) The process used for some radio (AM broadcast, in North American audio service broadcast over 535 kHz-1705 kHz) and television video transmission. A low frequency (program) signal modulates (changes) the amplitude of a high frequency RF carrier signal (causing it to deviate from its nominal base amplitude). The original program signal is recovered (demodulated) at the receiver. This system is extensively used in broadcast radio transmission because it is less prone to signal interference and retains most of the original signal quality. In video, FM is used in order to record high quality signals on videotape. **b)** The process by which the amplitude of a high-frequency carrier is varied in proportion to the signal of interest. In the PAL television system, AM is used to encode the color information and to transmit the picture. Several different forms of AM are differentiated by various methods of sideband filtering and carrier suppression. Double sideband suppressed carrier is used to encode the PAL color information, while the signal is transmitted with a large-carrier vestigial sideband scheme.

Amplitude Non-Uniformity – A term used in connection with magnetic tape testing and refers to the reproduced peak-to-peak voltage and its variation from what was recorded.

Amplitude Versus Frequency Response – Refer to the Frequency Response discussion.

AM-VSB (Amplitude Modulation with Vestigial Sideband) – The form of modulation used in broadcast and cable television transmission. It is more efficient than dual-sideband amplitude modulation and is easier to implement than single-sideband amplitude modulation.

Analog – a) A continuous electrical signal that carries information in the form of variable physical values, such as amplitude or frequency modulation. **b)** A signal which moves through a continuous range of settings or levels. **c)** An adjective describing any signal that varies continuously as opposed to a digital signal that contains discrete levels representing the binary digits 0 and 1. **d)** A signal that is an analogy of a physical process and is continuously variable, rather than discrete. See also Digitization.

Analog Components – Video signals in which a continuously variable voltage or current (rather than a set of digital numbers) represents a pixel.

Analog Interface – An interface between a display controller and a display in which pixel colors are determined by the voltage levels on three output lines (RGB). Theoretically, an unlimited number of colors can be supported by this method (24 bits per pixel allows 16,777,216 colors). The voltage level on any line varies between zero volts (for black) to about 700 millivolts (for maximum brightness).

Analog Monitor – A video monitor which accepts analog signals. Several types of inputs are accepted by analog monitors: composite video, RGB & sync, Y/C, YUV and any combination of these formats. The signals transmitted to an analog monitor are usually between 0 and 1 V and use 75 ohm coaxial cables.

Analog Recording – The common form of magnetic recording where the recorded waveform signal maintains the shape of the original waveform signal.

Analog Signal – Representation of data by continuously varying quantities. An analog electrical signal has a different value of volts or amperes for electrical representation of the original excitement (sound, light) within the dynamic range of the system.

Analog Video – a) A video signal represented by a smooth and infinite number of video levels. **b)** A video signal made of a continuous electrical signal. A television and VCR can be analog video devices. To be stored and manipulated on a computer, analog video must be converted to digital video.

Analysis Filterbank – Filterbank that transforms a broadband signal into a set of subsampled sub-band samples. An audio encoder function.

Analysis-By-Synthesis Coding – A method of coding in which the analysis procedure (encoder) has embedded in it the synthesis procedure (decoder). The reconstructed and original signals are compared and the difference is minimized. Used in many recent speech coding standards.

Anamorphic – a) Unequally scaled in vertical and horizontal dimensions. Applies to lenses used for widescreen movies. **b)** Distortion in viewing of images or geometry related to the difference between computer monitor screen aspect ratio (in which pixels are square) and broadcast, projected or frame aspect ratio (in which image pixels are wider than they are high).

Anamorphic Squeeze – A change in picture geometry to compress one direction (usually horizontal) more than the other. Anamorphic squeeze lenses made CinemaScope possible. Occasionally, when widescreen movies are transferred to video, an anamorphic squeeze will be used (usually only in credits) to allow the smaller aspect ratio of television to accommodate the larger movie aspect ratio. Some ATV proponents have suggested a gentle anamorphic squeeze as a technique to assist in aspect ratio accommodation.

Anamorphic Video – Found on a large number of DVDs, anamorphic video squeezes a 1.78:1 picture shape into a 1.33:1 image area. If you view an anamorphic video image on a 1.33 set, the characters will look tall and thin. This format is designed for the 1.78 aspect ratio TV sets where the horizontal is stretched back out to the full width of the set. Unsqueezing an anamorphic image on a 1.33 set is accomplished by squeezing the vertical size. The advantage of the anamorphic video system is 33% more vertical information in a widescreen picture.

Anchor Frame – A video frame that is used for prediction. I-frames and P-frames are generally used as anchor frames, but B-frames are never anchor frames.

Anchor Point – A bit stream location that serves as a random access point. MPEG I-frames are the most common anchor points.

Anchorage – For recording tape, the degree to which the magnetic tape oxide coating adheres to the base film.

Ancillary Timecode (ATC) – BT.1366 defines how to transfer VITC and LTC as ancillary data in digital component interfaces.

Anechoic – Literally, without echoes. Anechoic refers to the absence of audio reflections. The closest thing to this situation in nature is the great outdoors, but even here there are reflections from the ground, various objects, etc. It is almost impossible to create a truly anechoic environment, as there is no such thing as a perfect sound absorber. At high frequencies, it is possible to create near-anechoic conditions, but the lower the frequency, the harder that is.

Anechoic Chamber – A room which has totally sound absorbent walls, so that no reflected waves can exist and only the direct waves are heard.

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

Angle Menu – Menu used to select the Angle number.

Anhysteresis – The process whereby a material is magnetized by applying a unidirectional field upon which is superimposed an alternating field of gradually decreasing amplitude. One form of this process is analogous to the recoding process using AC Bias.

Animatic – Limited animation consisting of art work shot and edited to serve as a videotape storyboard. Commonly used for test commercials.

Animation – a) Animation is the process of fooling the human eye into perceiving a moving object by presenting the eye with a rapid succession of still pictures. Each still is called a frame. On the Cubicomp, animation consists of moving objects which, in themselves stay unchanged. **b)** The recording of a sequence of still artwork or objects in a way that makes them appear to move on film or video. 24 fps is considered the appropriate speed for animation.

Animation Curve – A curve depicting the interpolation between the various keyframes.

Animation Path – The motion of an object as it flies through space is called its animation or motion path.

Anisotropy – Directional dependence of magnetic properties, leading to the existence of easy or preferred directions of magnetization. Anisotropy of a particle may be related to its shape, to its crystalline structure or to the existence of strains within it. Shape anisotropy is the dominant form in acicular particles.

ANRS, Super ANRS – A noise reduction system used to JVC. ANRS operates on principles similar to those used by the Dolby system. Therefore, there is a degree of compatibility between recordings made with either system.

ANSI (American National Standards Institute) – ANSI is a voluntary and privately funded business standards group in the USA. ANSI seeks to promote and to facilitate consensus standards nationally, and is internationally engaged as the sole US member of the ISO. The members of ANSI consist of about 1,300 American and international companies, 30 government agencies and some 250 organizations of trade, labor, professionals, consumers, etc.

ANSI 4.40 – See AES/EBU Digital Audio.

Answer – Smoothing, removing, or reducing jagged edges along the lines and curves in test, images, or geometry.

Answer Print – The first print combining picture and sound submitted by the laboratory for the customers' approval.

Anti-Alias Filter – A filter (typically a lowpass filter) used to bandwidth-limit the signal to less than half the sampling rate before sampling.

Anti-Aliased Fonts – Computer generated fonts that have been digitally rounded for smooth edges.

Anti-Aliasing – The process of reducing aliasing effects. Aliasing occurs because a raster system is "discrete", i.e., made up of pixels that have finite size. Representing a line with black and white pixels results in "jaggies", or "aliases". These are particularly disturbing during animation. To correct them, "anti-aliasing" techniques are used. These techniques compute the proportion of a pixel to be a blend of the pixel's existing color (background) and the edge's value. This isn't possible in color mapped mode because each color map location is already allocated; there aren't enough map locations.

AOE (Applications and Operational Environments)

A-Only Edit (Audio-Only Edit)

AP – See Active Picture.

Aperture – a) An adjustable opening in a lens which, like the iris in the human eye, controls the amount of light entering a camera. The size of the aperture is controlled by the iris adjustment and is measured in F-stops. A smaller F-stop number corresponds to a larger opening that passes more light. **b)** As applied to ATV, the finite size and shape of the point of the electron beam in a camera or picture tube. As the beam does not come to an infinitesimal point, it affects the area around it, reducing resolution. **c)** The opening of a lens that controls the amount of light reaching the surface of the pickup device. The size of the aperture is controlled by the iris adjustment. By increasing the F-stop number (F/1.4, F/1.8, F/2.8, etc.) less light is permitted to pass to the pickup device.

Aperture Correction – a) Signal processing that compensates for a loss of detail caused by the aperture. It is a form of image enhancement adding artificial sharpness and has been used for many years. **b)** Electrical compensation for the distortion introduced by the (limiting) size of a scanning aperture. **c)** The properties of the camera lens, optical beam-splitting installation, and camera tube all contribute to a reduced signal at higher spatial frequencies generally falling off as an approximate sin (x)/x function. Additionally, it is obvious in a scanning system that the frequency response falls off as the effective wavelength of the detail to be resolved in the image approaches the dimension of the scanning aperture and becomes zero when the effective wavelength equals the dimension of the scanning aperture. Aperture correction normally introduced in all video cameras restores the depth of modulation to the waveform at higher frequencies with the objective of flat response to 400 TV lines (in NTSC) for a subjective improvement in image quality.

Aperture Delay – In ADCs, aperture delay is the time from an edge of the input clock of the ADC until the time the part 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 over time, and that little bit of change is the aperture jitter.

Aperture, Camera – The available maximum dimensions of the optical image on the active surface of the photo-sensor, within which good quality image information is being recorded. The camera aperture determines the maximum usable scene information captured and introduced into the system, and available for subsequent processing and display. These dimensions are usually defined by standards. (Note: Not to be confused with lens aperture, which defines the luminous flux transmission of the optical path.

Aperture, Clean – The concept of a clean aperture in a digital system defines an inner picture area (within the production aperture) within which the picture information is subjectively uncontaminated by all edge transient distortions (SMPTE 260M). Filtrations for bandwidth limitation, multiple digital blanking, cascaded spatial filtering, etc., introduce transient disturbances at the picture boundaries, both horizontally and vertically. It is not possible to impose any bounds on the number of cascaded digital processes that might be encountered in the practical post-production system. Hence, the clean aperture is defined to represent an acceptable (and practical) worst-case level of production.

Aperture, Display – The available maximum dimensions (mapped back into the camera aperture) for the system's ability to display good quality image information. The information available for display is usually cropped from the total captured by the cascade of tolerances that may be incorporated in the system, and also by intentional design features that may be introduced in the display.

Aperture, Production – A production aperture for a studio digital device defines an active picture area produced by signal sources such as cameras, telecines, digital video tape recorders, and computer-generated pictures. It is recommended that all of this video information be carefully produced, stored, and properly processed by subsequent digital equipment. In particular, digital blanking in all studio equipment should rigorously conform to this specified production aperture (SMPTE 260M). The width of the analog active horizontal line is measured at the 50% points of the analog video signal. However, the analog blanking may differ from equipment to equipment, and the digital blanking may not always coincide with the analog blanking.

Aperture, Safe Action – As defined by a test pattern, a safe action aperture indicates the safe action image area within which all significant action must take place, and the safe title image area, within which the most important information must be confined, to ensure visibility of the information on the majority of home television receivers. SMPTE RP 27.3 defines these areas for 35 mm and 16 mm film and for 2 x 2-inch slides.

API (Application Program Interface) – a) The software used within an application program to activate various functions and services performed by the operating system. **b)** The Windows operating system refers to API functions as those which open and close windows, interpret mouse movement, read the keyboard, etc. These control-type functions are called "hooks" to the operating system. **c)** APIs define the interfaces to the library of tools that are made available by the MPEG-4 systems, and the interfaces of the pieces of code that can be downloaded to the MPEG-4 systems.

APL (Average Picture Level) – The average signal level (with respect to blanking) during active picture time, expressed as a percentage of the difference between the blanking and reference white levels.

Apostilb – A photometric unit for measuring luminance where, instead of candelas, lumens are used to measure the luminous flux of a source.

Application – An application runs in a module, communicating with the host, and provides facilities to the user over and above those provided directly by the host. An application may process the transport stream.

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

Application Window – The workspace (window) available to an application. The size can be adjusted by the user and limited only by the size of the monitor's display.

APS (Advanced Photo System) – A new photographic system conceived by Kodak and developed jointly with Canon, Fuji, Minolta, and Nikon. The APS was launched in April 1996. APS also represents the file format used to store data on the new film's magnetic coating.

Apt-X100 – The apt-X100 is a proprietary audio compression algorithm from APT, Ltd., which features an adaptive differential PCM (ADPCM) algorithm in four sub-bands. The algorithm provides a fixed 4:1 compression with low delay and bandwidths ranging from 7.5 kHz to 22.5 kHz and output bit rates from 64 to 384 kbit/s, depending on the sampling rate.

APU (Audio Presentation Unit 13818-1) – A 13818-1 audio frame.

Architecture – a) Logical structure of a computer system. **b)** In digital video, architecture (also known as format) refers to the structure of the software responsible for creating, storing and displaying video content. An architecture may include such things as compression support, 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).

Archive – a) Off-line storage of video/audio onto backup tapes, floppy disks, optical disks, etc. **b)** A collection of several files bundled into one file by a program (such as ar, tar, bar, or cpio) for shipment or archiving. This method is very reliable and can contain large amounts of data. **c)** Long-term off-line storage. In digital systems, pictures are generally archived onto some form of hard disk, magnetic tape, floppy disk or DAT cartridge.

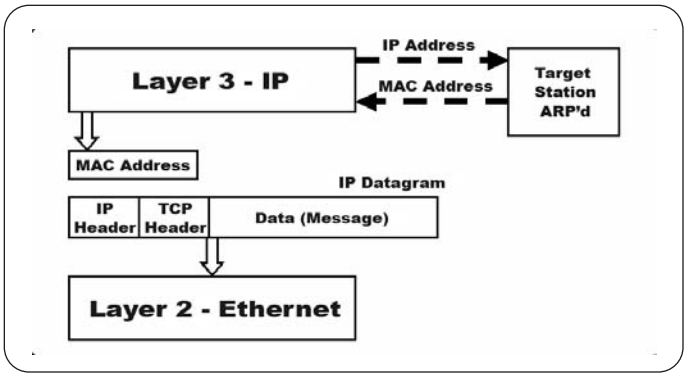
ARIB (Association of Radio Industries and Businesses) – ARIB conducts studies and R&D, provides consultation services for radio spectrum coordination, cooperates with other organizations around the world and provides frequency change support services for the smooth introduction of digital terrestrial television broadcasting.

Arithmetic and Logic Unit (ALU) – One of three essential components of a microprocessor. The other two are the registers and the control block. The ALU performs various forms of addition, subtraction, and logic operations, such as ANDing the contents of two registers or masking the contents of a register.

Arithmetic Coding – Perhaps the major drawback to each of the Huffman encoding techniques is their poor performance when processing texts where one symbol has a probability of occurrence approaching unity. Although the entropy associated with such symbols is extremely low, each symbol must still be encoded as a discrete value. Arithmetic coding removes this restriction by representing messages as intervals of the real numbers between 0 and 1. Initially, the range of values for coding a text is the entire interval (0, 1). As encoding proceeds, this range narrows while the number of bits required to represent it expands. Frequently occurring characters reduce the range less than characters occurring infrequently, and thus add fewer bits to the length of an encoded message.

A-Roll – A method of conforming that requires the compositing of all multilayer effects into a single layer (including laboratory-standard dissolves and fades) before assembly. Also called Single-Strand Editing.

ARP (Address Resolution Protocol) – A TCP/IP protocol used to obtain a node's physical address. A client station broadcasts an ARP request onto the network with the IP address of the target node it wishes to communicate with, and the node with that address responds by sending back its physical address so that packets can be transmitted. ARP returns the layer 2 address for a layer 3 address. Since an ARP gets the message to the target machine, one might wonder why bother with IP addresses in the first place. The reason is that ARP requests are broadcast onto the network, requiring every station in the subnet to process the request.



ARQ – See Application Programming Interface.

Array Processor – A compute engine that efficiently performs operations on large amounts of data with a regular structure (array).

ARS – See Automatic Route Selection.

Artifacts – a) Artifacts can range from noise and snow, to spots. Anything that is visually wrong with the picture is an artifact. Artifacts however do not include picture errors caused by improperly adjusted displays. Artifacts are visual errors caused by the signal being sent to the display. **b)** A defect or distortion of the image, introduced along the sequence from origination and image capture to final display. Artifacts may arise from the overload of channel capacity by excess signal bandwidth. Artifacts may also result from: sampling effects in temporal, spatial, or frequency domains; processing by the transfer functions; compromises and inadequacies in the system employed; cascading of minor defects; basically any other departure of the total system from "complete transparency". **c)** Visible (or audible) consequences of various television processes. Artifacts are usually referred to only when they are considered defects. Artifact elimination is often more apparent than quality increases such as resolution enhancement. **d)** Interference or other unwanted "noise" in video such as flickering, changes in color and macroblocking. Some artifacts, such as macroblocking, can be remedied in video compression and some cannot. The quality of the finished product is, in large part, no better than the source material. See also Filter Artifacts, Impairments, and NTSC Artifacts.

ASA – Exposure index or speed rating that denotes the film sensitivity, defined by the American National Standards Institution. Actually defined only for black-and-white films, but also used in the trade for color films.

ASCII (American Standard Code for Information Interchange) – a) Character code used for representing information as binary data in most computer systems. b) A standard code for transmitting data, consisting of 128 letters, numerals, symbols and special codes each of which is represented by a unique binary number.

ASF (Active Streaming Format) – a) A Microsoft file format for digital video playback over the Internet, or on a standalone computer. Kind of a wrapper around any of a number of compression types, including MPEG. **b)** Part of a NetShow, a proprietary streaming media solution from Microsoft. Biggest competitor is Real Networks. While this 'wrapper' supports many standard formats, ASF files are themselves proprietary.

ASI (Asynchronous Serial Interface) – Transmission standard defined by the digital video broadcast (DVB) used to connect video delivery equipment within a cable, satellite or terrestrial plant.

ASIC (Application Specific Integrated Circuit) – An integrated circuit designed for special rather than general applications.

ASN.1 (Abstract Syntax Notation 1) – OSI language for describing data types independent of particular computer structures and representation techniques. Described by ISO International Standard 8824.

ASPEC (Adaptive Spectral Perceptual Entrophy Coding) – An algorithm developed by Fraunhofer Institut, AT&T, Thomas Brandt, and the CNET. The ASPEC algorithm was later used for developing the MPEG audio Layer 3 specification.

Aspect Ratio – The ratio of the width of the picture to the height. For most current TVs, this ratio is 4:3. For HDTV, the ratio will be 16:9. The aspect ratio, along with the number of vertical scan lines that make up the image, determines what sample rate should be used to digitize the video signal.

:1	:9	Description
1.0	9	Square photographic formats, including Instamatic 126
1.33	12	Existing television, old movies, Pocket Instamatic 110
1.44	13	IMAX film
1.5	13.5	35mm still photographs, proposed for theatrical release
1.61	14.5	Faroudja HDTV proposal
1.67	15	Original NHK proposal, theatrical projection outside the U.S.
1.78	16	ATSC/SMPTE HDEP standard, optimized for shoot and protect
1.85	17	Theatrical projection in the U.S.
2.0	18	Most forms of VistaVision
2.2	20	Some widescreen movie formats
2.35	21	CinemaScope and similar movie formats
2.6	23	Cinerama
2.7	24	Dimension-150, Ultra-Panavision
2.77	25	Dynavision widescreen 3D film format
4.0	36	Polyvision

Aspect Ratio Accommodation – Techniques by means of which something shot in one aspect ratio can be presented in another. The five currently used or proposed techniques are compared in the following table. It is also possible to combine techniques. Current ATV aspect ratio debates concentrate on the problems of presenting widescreen images to existing TV sets; the same problems (in an opposite direction) will occur when current aspect ratio images are presented on widescreen TV sets. In movie theaters these problems are usually solved with movable drapes.

	Blanking Adjust	Truncation	Pan and Scan	Anamorphic Squeeze	Shoot and Protect
Maintain Director's Intent	Y	N	N	N	Y
Uses Full Screen (No Burn)	N	Y	Y	Y	Y
Displays All Action	Y	N	N	Y	Y
Maintains Picture Geometry	Y	Y	Y	N	Y
Automatic Conversion Possible	Y	Y	N	Y	Y
Full Production Freedom	Y	Y	Y	Y	N

Asperities – Small projecting imperfections on the surface of the tape costing that limit and cause variations in head-to-tape contact.

Aspherical Lens – A lens that has an aspherical surface. It is harder and more expensive to manufacture, but it offers certain advantages over a normal spherical lens.

Assemble – One of the two editing modes that are possible with video tapes. All tracks on the tape are added free of disturbances at the cutting point, but all tracks are newly written. The other editing method is known as Insert Edit.

Assembled Edit – a) Electronic edit that replaces all previously recorded material with new audio and video and a new control track, starting at the edit point. Inserting a new control track allows for a constant speed reference throughout the entire tape. **b)** Adding material that has a different signal to the end of a pre-recorded section of a videotape. Adding an assemble edit to the middle of an existing segment causes an abrupt and undesirable change in the sync of the video signal. Contrast with Insert Edit.

Assembler Program – Translates assembly language statements (mnemonics) into machine language.

Assembly Language – Machine-oriented language. A program is normally written as a series of statements using mnemonic symbols that suggest the definition of the instruction. It is then translated into machine language by an assembler program.

Astigmatism – The uneven foreground and background blur that is in an image.

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

ASVP (Application-Specific Virtual Prototype)

Asymmetric Compression – Compression in which the encoding and decoding require different processing power (the encoding is normally more demanding).

Asymmetrical Digital Subscriber Line – Bellcore's term for one-way T-1 to the home over the plain old, single twisted pair wiring already going to homes. ADSL is designed to carry video to the home. ADSL, like ISDN, uses adaptive digital filtering, which is a way of adjusting itself to overcome noise and other problems on the line. According to Northern Telecom, initial ADSL field trails and business cases have focused on ADSL's potential for video on Demand service, in competition with cable pay-per-view and neighborhood video rental stores. But ADSL offers a wide range of other applications, including education and health care. Once telephone companies are able to deliver megabits to the home, Northern Telecom expects an explosion in potential applications including work-at-home access to corporate LANs, interactive services such as home shopping and home banking and even multi-party video gaming, interactive travelogues, and remote medical diagnosis. Multimedia retrieval will also become possible, enabling the home user to browse through libraries of text, audio, and image data – or simply subscribe to CD-quality music services. In the field of education, ADSL could make it possible to provide a low-cost "scholar's workstation" – little more than a keyboard, mouse and screen – to every student, providing access to unlimited computer processing resources from their home. For a more modern version of ADSL, see DMT, which stands for Discrete Multi-Tone.

Asynchronous – a) A transmission procedure that is not synchronized by a clock. b) Any circuit or system that is not synchronized by a common clock signal. c) Lacking synchronization. In video, a signal is asynchronous when its timing differs from that of the system reference signal. A foreign video signal is asynchronous before a local frame synchronizer treats it.

Asynchronous Data Streaming – Streaming of only data without any timing requirements. See Asynchronous Data Streaming, Synchronous Data Streaming.

Asynchronous Signals – Data communication transmission of signals with no timing relationship between the signals. Stop and start bits may be used to avoid the need for timing clocks.

Asynchronous Transfer Mode (ATM) – a) A digital transmission system using packets of 53 bytes for transmission. ATM may be used for LANs and WANs. ATM is a switching/ transmission technique where data is transmitted in small, 53 byte fixed sized cells (5 byte header, 48 byte payload). The cells lend themselves both to the time-division-multiplexing characteristics of the transmission media, and the packet switching characteristics desired of data networks. At each switching node, the ATM header identifies a virtual path or virtual circuit that the cell contains data for, enabling the switch to forward the cell to the correct next-hop trunk. The virtual path is set up through the involved switches when two endpoints wish to communicate. This type of switching can be implemented in hardware, almost essential when trunk speed range from 45 Mbps to 1 Gbps. The ATM Forum, a worldwide organization, aimed at promoting ATM within the industry and the end user community was formed in October 1991 and currently includes more than 500 companies representing all sectors of the communications and computer industries, as well as a number of government agencies, research organizations and users. **b)** A digital signal protocol for efficient transport of both constant-rate and bursty information in broadband digital networks.

AT&T – Consumer electronics manufacturer and long distance telephone, television, and data carrier. Its Bell Labs has worked on the development of ATV systems.

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

ATC – See Ancillary Timecode.

ATC (Adaptive Transform Coding) – A method used to encode voice transmissions using only 16 kpbs.

ATC (American Television and Communications) – Time Inc.'s CATV multiple system operator (MSO), a co-proposer with HBO of C-HDTV and a supporter of ACTV.

ATEL (Advanced Television Evaluation Laboratory) – World-unique facility for conducting subjective assessments of picture quality for advanced television, digital video and multimedia services delivered using a wide range of formats, from low resolution to high-definition television (HDTV) and three-dimensional television (3D-TV).

A-Time (Absolute Time) – Elapsed time, referenced to the program start (00:00:00), on a DVD. A-time is measured in minutes, seconds and frames.

ATM – See Asynchronous Transfer Mode.

ATM Cell – An ATM packet of 53 bytes, 5 bytes for the header, 48 bytes payload.

ATM Forum – An international body of technical representatives defining ATM as a delivery mechanism, including ATM-based transfer, switching and management.

A-to-D Converter – a) A circuit that uses digital sampling to convert an analog signal into a digital representation of that signal. An ADC for digitizing video must be capable of sampling at 10 to 150 million samples per second (MSPS). b) Converts analog voltages and currents to the digital representation used by computer systems. This enables the computer to sense real-world signals.

ATR (Audiotape Recorder) – A device for recoding and reproducing sound on magnetic recording tape.

ATRAC (Adaptive Transform Acoustic Coding) – An algorithm that splits an audio signal into three non-uniform sub-bands.

ATRP (Advanced Television Research Program) – ATRP was established at MIT in 1983 by a consortium of U.S. companies. The major objectives of the ATRP are: to develop the theoretical and empirical basis for the improvement of existing television systems, as well as the design of future television systems; to educate students through television-related research and development and to motivate them to undertake careers in television-related industries; to facilitate continuing education of scientists and engineers already working in the industry; to establish a resource center to which problems and proposals can be brought for discussion and detailed study; to transfer the technology developed from this program to the industries.

ATSC – See Advanced Television Systems Committee.

ATSC A/49 – Defines the ghost cancellation reference signal for NTSC.

ATSC A/52 – Defines the (Dolby Digital) audio compression for ATSC HDTV.

ATSC A/53, A/54 – Defines ATSC HDTV for the USA.

ATSC A/57 – Defines the program, episode, and version ID for ATSC HDTV.

ATSC A/63 – Defines the method for handling 25 and 50 Hz video for ATSC HDTV.

ATSC A/65 – Defines the program and system information protocol (PSIP) and ATSC HDTV.

ATSC A/70 – Defines the conditional access system for ATSC HDTV.

ATSC A/90 – Defines the data broadcast standard for ATSC HDTV.

ATSC A/92 – Defines the IP multicast standard for ATSC HDTV.

Attack – In audio terms, the beginning of a sound. What type of attack a sound has is determined by how long it takes for the volume of the sound to go from silence to maximum level. It is critical to consider the attack time of sounds when applying processing Compression, gating, and other types of processors as they may destroy a sound's attack, changing the character and quality of the audio. Reverbs can also be affected by attack time; careful use of a 'reverb's predelay parameter will allow you to optimize the reverb for different types of attacks.

ATTC (Advanced Television Test Center) – Created by seven broadcasting organizations to test different broadcast ATV systems. See also Cable Labs.

ATT-C (AT&T Communications) – The Long distance arm of AT&T.

Attenuation – A decrease in the level of a signal is referred to as attenuation. In some cases this is unintentional, as in the attenuation caused by using wire for signal transmission. Attenuators (circuits which attenuate a signal) may also be used to lower the level of a signal in an audio system to prevent overload and distortion.

Attenuator – A circuit that provides reduction of the amplitude of an electrical signal without introducing appreciable phase or frequency distortion.

Attic Folder – The folder containing backups of your files or bins. Every time you save or the system automatically saves your work, copies of your files or bins are placed in the attic folder, until the folder reaches the specified maximum. The attic folder copies have the file name extension.bak and a number added to the file name. The number of backup files for one project can be changed (increased or decreased) in the Bin Settings dialog box.

Attribute Clip – A mechanism that applications can use to store supplemental information in a special track that is synchronized to the other track in a track group.

ATV – See Advanced TV.

AU – See Access Unit.

Audio – a) Signals consisting of frequencies corresponding to a normally audible sound wave ranging between the frequencies of 20 Hz to 20,000 Hz. **b)** A DC signal with varying amounts of ripple. It is sometimes possible to see the ripple on the DC signal to convey information of widely variable degrees of usefulness. **c)** The sound portion of a program.

Audio Balanced Signals – These are signals with two components, equal in amplitude but opposite in polarity. The impedance characteristics of the conductors are matched. Current practices designate these as non-inverted and inverted, + and – or positive and return. Interconnect cables usually have three conductors. Two arranged as a twisted pair, carry the non-inverted and inverted. By employing a twisted pair of conductors for the signal leads, the loop area responsible for magnetic interference is minimized. The third conductor is a shield.

Audio Bandwidth – The range of audio frequencies which directly influence the fidelity of the audio. The higher the audio bandwidth, the better the audio fidelity. The highest practical frequency the human ear can normally hear is 20 kHz. An audio amplifier that processes all frequencies equally (flat response to 20 kHz) and a reasonably high signal to noise ratio, will accurately amplify the audio signal.

Audio Breakaway (ABKW) – The ability to independently select audio sources regardless of which video source is selected, even though the audio is normally associated with a particular video (as opposed to follow).

Audio Buffer – A decoder buffer for storage of compressed audio data.

Audio Channel Number – These are consecutive numbers assigned to the Audio channel of the audio stream. They range from "0" to "7" in the description are of the video title set manager area. ACH0 and ACH1 are assigned to left channel and right channel respectively for two-channel stereo audio signals.

Audio Coding Mode – In general this is often used to show an audio coding method such as linear PCM, AC-3 or MPEG audio, etc., but in some contexts it refers to the channel constitution in AC-3 tracks and the speaker layout.

Audio Control Packet – Transmitted once per field in the second horizontal ancillary data space after the vertical interval switch point. It contains information on audio frame number, sampling frequency, active channels, and relative audio-to-video delay of each channel. Transmission of audio control packets is optional for 48 kHz synchronous operation and required for all other modes of operation.

Audio Dub – Process which allows for the replacement of an audio signals on a previously recorded tape without disturbing the video signal.

Audio Editing – Portions of the audio material are combined and recorded onto the videotape. Examples include creating a sound track that includes signals such as background music, voice narration or sound effects.

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 Follow Video (AFV) – Audio selections made simultaneously upon selection of associated video sources (as opposed to audio breakaway).

Audio Level Measurements – Typically within audio measurements a dBm value is specified. This means that a reference power of 1 mW was used with a 600 W termination. Therefore using the equations 0 dBm is equivalent to a voltage of 0.775 V into a 600 W load. You may encounter several different types of dB measurements used within audio. The following list indicates the typically used equations.

dBm = 10 logP1/.001W

dBV = 20 logV2/1V rms

dBu = 20 log V2/775mV rms

dBSPL = 20 logP1/P2

Audio Levels – The level of the audio signal in either voltage or current. Audio levels are measured and indicated by mechanical VU-meters or electronic LED bar graph meters. It is important to maintain the proper audio level. If the audio level is too high when recording, overload of the input electronics and audio distortion will result. When audio levels are low, the signal-to-noise ratio is compromised.

Audio Matrix – That portion of the switcher electronics used to switch audio sources. Usually this matrix is controlled by AFV selections on the primary matrix, ABKW selections on an aux audio bus, or by an external editor or computer control.

Audio Menu – Menu used to select the audio stream.

Audio Mixer – A component that combines more than one sound input for composite output.

Audio Mixing – The blending of two or more audio signals to generate a combined signal which is often used for audio dub. During video processing, audio mixing may be used to insert narration or background music.

Audio Modulation – A carrier is modified with audio information and is mixed with the video information for transmission.

Audio Modulation Decoders – Converts sound carrier elements of the video waveform into left and right audio channels for stereo monitoring.

Audio Modulation Monitors – Displays sound carrier elements of the video waveform.

Audio On ISDN – Through use of the MPEG audio specification, the ISDN (Integrated Services Digital Network) may be tuned into an audio transmission media. Data compression techniques like MPEG Layer II allow a tailored mix of cost and quality, and are now thought of implicitly when talking audio on ISDN.

Audio Scrub – See Scrubbing

Audio Sequence – A series of audio frames with the same global parameters.

Audio Signals – XLR connectors provide dual-channel audio signals. The left channel can be set to click as a means of easily distinguishing the left channel from the right channel in audio tests.

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

Audio Subcarrier – A specific frequency that is modulated with audio data before being mixed with the video data and transmitted.

Audio Subframe – There are 100 subframes of audio for every frame of video.

Audio Sweetening – The mixing of sound effects, music and announcer audio tracks with the audio track of the edited master tape, usually during the mixing stages of a production. Also called Audio Post-Production for Video.

Audio Timecode – Longitudinal timecode (LTC) recorded on an audio track.

Audio Visual Objects (AV Objects) – An AV object is a representation of a real or virtual object that can be manifested aurally and/or visually. AV objects are generally hierarchical, in that they may be defined as composites of other AV objects, which are called sub-objects. AV objects that are composites of sub-objects are called compound AV objects. All other AV objects are called primitive AV objects.

Audio Visual Scene (AV Scene) – A set of media objects together with scene description information that defines their spatial and temporal attributes including behavior resulting from object and user interaction.

Audio/Video Mixer – A single electronic component that consists of an audio mixer and a video mixer, switcher, or special effects generator. Also called an A/V Mixer.

Audio-Follow-Video – During video recording or editing, the video signal is usually accompanied by its associated audio signal. While editing video, it is sometimes necessary to separate the audio and video signals. Audio-follow-video mixers allow the audio to, or not to follow the video when switching video signals.

AudioVision – A registered trademark of Avid Technology, Inc. A digital, nonlinear audio editing system that locks digital video in sync with audio for audio editing and sweetening.

Auditory Masking – Auditory masking is used in MPEG and Dolby Digital compression, and is coded based on the range of frequency that human ears can detect. A phenomenon that occurs when two sounds of similar frequencies occur at the same time. Because of auditory masking, the louder sound drowns out the softer sound and makes it inaudible to the human ear.

Augmentation Channel – A transmission channel carrying information that can augment that being transmitted in an ordinary transmission channel such that a special television set that can receive both channels can get a better picture than those available from the main channel alone. Some ATV schemes require the augmentation channel to be adjacent to the main channel. Others can theoretically accept a non-adjacent augmentation channel, though, at the time of this writing, the acceptability of non-adjacent channels has not been proven to everyone's satisfaction.

Authoring – The encoding of material from various sources, all the conversion processes of the encoded data, incorporating the required control structures and other signals for playback sequences in the DVD-video format. The final product of authoring is a DLT tape with DVD image files in DDP format.

Authoring Platform – Computer hardware and software used to create material for use on a multimedia system. The video quality of the authoring platform has to be high enough that the playback equipment is the limiting factor.

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

Auto Assembly – a) Process of assembling an edited videotape on a computerized editing system under the control of an edit decision list (EDL). A computer automatically conforms source footage into an edited video program under the direction of a list of preprogrammed edit instructions. **b)** 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. **c)** The automatic assembling of an edited video tape on a computerized editing system (controller), based on an edit decision list (EDL).

Auto Iris (AI) – An automatic method of varying the size of a lens aperture in response to changes in scene illumination.

Automated Measurement Set – Device that automatically performs tests on audio and video signals and generates pass/fail results by testing the signals against predetermined parameters.

Automatic – In recorders, refers to either electrical or mechanical automatic bias switching devices.

Automatic Color Correction (ACC) – A circuit found in many consumer viewing devices that attempts to compensate for the "Never Twice the Same Color" broadcast problems. This circuit can go far beyond the Auto Tint function in that it changes color saturation as well as type of color. In most cases where ACC is present, it cannot be defeated. Adjusting the color and tint controls, using the SMPTE Color Bar pattern and the blue filter will result in a gross misadjustment of color level on the set. The color level may have to be reduced by as much as half the value calibrated with the SMPTE Color Bar pattern.

Automatic Focus – A feature on most consumer and industrial video cameras and camcorders that automatically makes minor focal length adjustments, thus freeing the videographer from focusing concerns.

Automatic Frequency Control (AFC) – Automatic frequency control. Commonly used to lock onto and track a desired frequency.

Automatic Gain Control (AGC) – a) Circuitry used to ensure that output signals are maintained at constant levels in the face of widely varying input signal levels. AGC is typically used to maintain a constant video luminance level by boosting weak (low light) picture signals electronically. Some equipment includes gain controls that are switchable between automatic and manual control. **b)** Electronic circuitry that compensates for either audio or video input level changes by boosting or lowering incoming signals to match a preset level. Using AGC, changing input levels can output at a single constant setting. **c)** A feature on most video cameras and camcorders that, when engaged, boosts the signal to its optimum output level. Automatic gain control (AGC) is available for video, and less frequently audio use.

Automatic Iris – A feature on most video cameras and camcorders that automatically creates the lens aperture that allows the imaging device to perform under optimum conditions.

Automatic Level Control (ALC) – Circuitry used to automatically adjust the audio recording level to compensate for variations in input volume. Some equipment includes level controls that are switchable between automatic and manual control.

Automatic Picture Stop – The disc player will automatically take the program from the play mode to a still frame mode according to information programmed in the vertical interval of the disc's video.

Automatic Retransmission Tool (ARQ) – One of the error correction tools of the Protection Layer. This tool is used to correct errors detected by the error detection tool by requesting retransmission of the corrupted information. A bidirectional connection is necessary in order to use ARQ.

Automatic Route Selection – An important part of an automatic least-cost routing system.

Automatic Shut-Off – A device (usually a mechanical switch) incorporated into most tape recorders that automatically stops the machine when the tape runs out or breaks.

Auto-Pan – A feature exclusive to AVC series switchers causing a positioned pattern to center itself as it grows in size.

AutoSave – A feature that saves your work at intervals you specify. Backups are placed in the attic folder.

Auto-Transition – a) The ability to electronically simulate a fader motion over an operator specified duration. b) An automatic transition where the motion of the switcher lever arm is electronically simulated when the AUTO TRANS push-button is pressed. The duration of the transition in television frames or seconds is indicated by the rate display LED.

AUX (Auxiliary Track) – In a video editing system, a channel reserved for connecting an external audio device, video device or both.

Auxiliary Bus – A bus which has the same video sources as the switcher but whose crosspoints may be remotely controlled, independently of the switcher console.

Auxiliary Channel (AUX) – In a video editing system, a channel reserved for connection to an external audio and/or video device.

Available Bitrate (ABR) – An ATM service that allows users to access unused network capacity.

AVI (Audio Video Interleaved) – The Video for Windows® file format for digital video and audio. An AVI (.avi) file is a RIFF file format used with applications that capture, edit and playback audio/video sequences. AVI files contain multiple streams of different types of data. Most AVI sequences will use both audio and video data streams. Specialized AVI sequences might include control track as an additional data stream. See Video for Windows®.

Avid Disk – The disk on the Macintosh platform that contains the operating system files. The computer needs operating system information in order to run.

Avid Projects Folder – The folder containing your projects.

A-Vision – An ATV system proponent.

AVK (Audio Video Kernel) – DVI system software designed to play motion video and audio across hardware and operating system environments.

AVO – See Audio Visual Objects.

AVR (Avid Video Resolution) – The compression level at which visual media is stored by the Avid system. The system creates media in a particular AVR using proprietary conversion algorithms to convert analog video to digital form.

AVSS (Audio-Video Support System) – DVI system software for DOS. It plays motion video and audio.

AWG (American Wire Gauge) – A wire diameter specification based on the American standard. The smaller the AWG number, the larger the wire diameter.

AWGN (Additive White Gaussian Noise) – This is an additive noise source in which each element of the random noise vector is drawn independently from a Gaussian distribution.

Axis – a) An imaginary line through the video image used as a reference point for rotation and movement. The three axes are H (horizontal), Y (vertical) and A (depth). b) The component of an object that you use to determine its two or three dimensional space and movement.

Azimuth – The angle of a tape head's recoding gap relative to the tape.

Azimuth Alignment – Alignment of the recoding and reproducing gaps so that their center lines lie parallel with each other and at right angles to the direction of head/tape motion. Misalignment of the gaps causes a loss in output at short wavelengths. For example, using a track width of 50 mils, a misalignment of only 0.05 degrees will cause a 3 dB loss at a wavelength of 0.1 mil.

Azimuth Loss – High frequency losses caused by head misalignment.

▶ B

B Bus – The bottom row of the two rows of video source select buttons associated with a given mixed effect (M/E).

BAB (Binary Alpha Blocks) – Binary shapes coded into blocks 16 pixels square, like the macroblock used for textures, are known as binary alpha blocks (BABs). There are three classes of block in a binary mask; those where all pixels are transparent (not part of the video object); those where all pixels are opaque (part of the video object); and those where some pixels are transparent and other opaque.

Baby Bell – A term commonly used for one of the seven regional holding companies established when AT&T divested itself of its local telephone companies. The Baby Bells are: American, Bell Atlantic, Bell South, Nynex, Pacific Telesis, Southwestern Bell, and US West.

Back Focus – a) A physical repositioning of the CCD, the camera element that translates light into electronic pulses for recording on videotape. The effect is to lengthen or shorten the distance between the lens and the CCD. **b)** A procedure of adjusting the physical position of the CCD-chip/lens to achieve the correct focus for all focal length settings (especially critical with zoom lenses).

Back Haul – Long distance digital data transport service such as Sonet, SDH or Telecos.

Back Hauler – Company that provides back haul services.

Back Light – a) A switch on some camcorders used to compensate exposure for situations where the brightest light is coming from behind the subject. **b)** A light source that illuminates a subject from behind, used to separate the subject from the background and give them depth and dimension.

Back Porch – a) The portion of the video signal that lies between the trailing edge of the horizontal sync pulse and the start of the active picture time. Burst is located on the back porch. **b)** The back porch of a horizontal synchronizing pulse is that area from the uppermost tip of the positive-going right-hand edge of a sync pulse to the start of active video. The back porch of a color video sync pulse includes the 8 to 9 cycles of reference color burst. The back porch is at blanking level.

Back Porch Tilt – The slope of the back porch from its normal horizontal position. Positive or negative refer respectively to upward or downward tilt to the right.

Back Time – Calculation of a tape in-point by finding the out-point and subtracting the duration of the edit.

Back Up – To copy a certain set of files and directories from your hard disk to a tape or other non-volatile storage media.

Backbone – Transmission and switching equipment that provides connections in distributed networks.

Backcoating – A conductive additional coating used on the reverse side of magnetic tape to control mechanical handling and minimize static generation.

Background – May be thought of as the deepest layer of video in a given picture. This video source is generally selected on a bus row, and buses are frequently referred to as the background source.

Background Generator – A video generator that produces a solid-color output which can be adjusted for hue, chroma, and luminance using the controls in the MATTE/BKGD control group.

Background Transition – A transition between signals selected on the Preset Background and Program Background buses, or between an "A" bus and "B" bus on an M/E.

Background Video (BGD) – a) Video that forms a background scene into which a key may be inserted. Background video comes from the Preset Background and/or Program Background bus or from an N/E "A" or "B" bus. **b)** A solid-color video output generated by the color Background generator within the switcher for use as background video.

Backhaul – In television, the circuits (usually satellite or telephone) used to transmit or "haul" a signal back from a remote site (such as a sports stadium) to a network headquarters, TV station or other central location for processing before being distributed.

Backplane – The circuit board that other boards in a system plug into. Usually contains the system buses. Sometimes called a Motherboard.

Back-Timing – a) Timing of a program from the end to the beginning. A reversal of clock-order so that remaining time or time left to the end of the program can be easily seen. **b)** A method of calculating the IN point by subtracting the duration from a known OUT point so that, for example, music and video or film end on the same note.

Backup – A duplicate copy of a file or disk in another location if the original file or disk becomes corrupted. See also Attic Folder.

Backup Tape – A tape that contains a copy of a set of files and directories that are on your hard disk. A full backup tape contains a copy of all files and directories, including IRIX, which are on your hard disk.

Backward Compatibility – A new coding standard that is backward compatible with an existing coding standard if existing decoders (designed to operate with the existing coding standard) are able to continue to operate by decoding all or part of a bit stream produced according to the new coding standard.

Backward Motion Vector – A motion vector that is used for motion compensation from a reference picture at a later time in display order.

Backward Prediction – Prediction from the future reference vop.

Baffles – Sound absorbing panels used to prevent sound waves from entering or leaving a certain space.

Balanced Cable – In audio systems, typically refers to a specific cable configuration that cancels induced noise.

Balanced Line – A line using two conductors to carry the signal, neither of which is connected to ground.

Balanced Signal – a) A video signal is converted to a balanced signal to enable it to be transmitted along a "twisted pair" cable. **b)** In CCTV this refers to a type of video signal transmission through a twisted pair cable. It is called balanced because the signal travels through both wires, thus being equally exposed to the external interference, so by the time the signal gets to the receiving end, the noise will be cancelled out at the input of a differential buffer stage.

Balun – A device used to match or transform an unbalanced coaxial cable to a balanced twisted pair system.

Banding – The presence of extraneous lines.

Bandpass Filter – Circuit that passes a selected range of frequencies.

Bandwidth – The range of frequencies over which signal amplitude remains constant (within some limits) as it is passed through a system. More specific definitions include: **a)** The difference between the upper and lower limits of a frequency, often measured in megahertz (MHz). **b)** The complete range of frequencies over which a circuit or electronic system can function with less than a 3 dB signal loss. **c)** The information carrying capability of a particular television channel. **d)** A measure of information capacity in the frequency domain. The greater the bandwidth of a transmission channel, the more information it can carry. **e)** In television, bandwidth is usually expressed in MHz.

Bandwidth Efficient – Phrase sometimes used to describe techniques to carry the maximum amount of picture information within a prescribed bandwidth; also, name applied to one MIT ATV proposal that would transmit only the spatio-temporal resolution necessary for a particular scene. For example, it would transmit no more than 24 frames per second when showing a movie shot at that rate.

Bandwidth Limiting – A reduction in the effective bandwidth of a signal, usually to facilitate recording, transmission, broadcast, display. etc. The reduction is usually accomplished through the action of an algorithm, which may involve simple lowpass filtering, more complex processing such as interleaving or quadrature modulation, or complete resampling. The term bandwidth limiting is normally applied in analog systems, although it also has a comparable meaning in digital systems.

Bandwidth Segmented Orthogonal Frequency Division Multiplexing (BST-OFDM) – Attempts to improve on COFDM by modulating some OFDM carriers differently from others within the same multiplex. A given transmission channel may therefore be "segmented", with different segments being modulated differently.

Bandwidth, Monitor – Monitor bandwidth is proportional to the speed at which a monitor must be turned on and off to illuminate each pixel in a complete frame and is proportional to the total number of pixels displayed. For example, a monitor with a resolution of 1000 x 1000 pixels which is refreshed at 60 times a second, requires a minimum theoretical bandwidth of over 45 MHz. Once overhead is considered for scanning and small spot size, the bandwidth could be as much as 100 MHz.

BAP (Body Animation Parameters) – Set of parameters used to define and to animate body objects. See also BDP.

Bar Code – A pattern of vertical stripes of varying width and spacing that encodes information. Bar codes can be used to encode timecode on film.

Bark – An audio measure in units of critical band rate. The Bark Scale is a non-linear mapping of the frequency scale over the audio range. It closely corresponds to the frequency selectivity of the human ear across the band.

Barn Doors – a) Two- or four-leafed metal blinders mounted onto lights to control brightness or direction. **b)** A term used in television production to describe the effect that occurs when a 4:3 image is viewed on a 16:9 screen. Viewers see black bars (barn doors) on the sides of the screen.

Base – See Radix.

Base Bandwidth – The amount of bandwidth required by an unmodulated signal, such as video or audio. In general, the higher the quality of the signal, the greater the base bandwidth it requires.

Base Board – Printed circuit board (and mounted components such as integrated circuits, etc.) that is inserted into the computer's expansion slot. A module board is often attached to the base board.

Base Film – For magnetic tapes, the plastic substrate that supports the coating. The base film of most precision magnetic tape is made of polyester.

Base Film Thickness – The thickness of the polyester material used for magnetic tape, varying from 0.24 mil in C120 cassette tape to 1.5 mil for audio mastering tape and instrumentation tape.

Base Layer – The minimum subset of a scalable hierarchy that can be decoded.

Baseband – a) Refers to the composite video signal as it exists before modulating the picture carrier. Not modulated. Composite video distributed throughout a studio and used for recording is at baseband. **b)** Video and audio signals are considered to be "prime", or baseband. Video and audio can be broken down into more basic elements, but those elements no longer constitute the desired signal as a single element. Baseband video and audio signals are often AM or FM modulated onto a carrier frequency, so that more than one set of "prime" signals can be transmitted or recorded at the same time. **c)** In DTV, baseband also may refer to the basic (unmodulated) MPEG stream.

Baseband Signal – A baseband signal is an analog or digital signal in its original form prior to modulation or after demodulation.

Baseline IRD – An IRD (Integrated Receiver Decoder) which provides the minimum functionality to decode transmitted bitstreams. It is not required to have the ability to decode Partial Transport Streams (TS) as may be received from a digital interface connected to digital bitstream storage device such as a digital VCR.

Baseline Restorer – An information processing unit intended to remove the DC and low order frequency distortion terms that result from use of record/reproduce transfer function which cannot pass DC in conjunction with a binary code that requires low frequency response to DC (i.e., zero frequency) for accurate recovery of such a code.

Baseline Shift – A form of low-frequency distortion resulting in a shift in the DC level of the signal.

BASIC – An easy-to-learn, easy-to-use language, which is available on most microcomputer systems.

Basic Cable Service – Package of programming on cable systems eligible for regulation by local franchising authorities under 1992 Cable Act, including all local broadcast signals and PEG (public, educational and government) access channels.

Basic Rate – ISDN's basic rate interface (BRI) consists of two B-channels (128 kbps) and a D-channel (data) of 16 kbps.

BAT (Body Animation Table) – A downloadable function mapping from incoming Body Animation Parameters (BAPs) to body surface geometry that provides a combination of BAPs for controlling body surface geometry deformation.

BAT (Bouquet Association Table) – a) The BAT provides information regarding bouquets (collections of services marketed as a single entity). **b)** A table describing a bouquet of programs offered by a broadcaster. DVB only.

Batch Capture – a) Combining your video capture card with deck control so that you can define your in and out points first, then capture only the footage you want. **b)** The automated process of capturing clips in a list. See Batch List.

Batch Digitize – The automated process in which groups of clips, sequences, or both are digitized (recorded digitally).

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

Batch Record – The automated process in which groups of clips, sequences, or both are digitized (recorded digitally).

Baud – A unit of signaling speed equal to the number of signal events per second. Baud is equivalent to bit 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 each other.

Baud Rate – a) The speed (calculated as bits per second) at which the computer sends information to a serial device, such as a modem or terminal. **b)** Measure of data flow: the number of signal elements per second. When each element carries one bit, the baud rate is numerically equal to bits per second (BPS). For example, teletypes transmit at 110 baud. Each character is 11 bits, and the TTY transmits 10 characters per second. **c)** The rate at which data is transmitted. The baud rates must match if two devices are to communicate with each other. **d)** The number of electrical oscillations that occur each second. Baud was the prevalent measure for bandwidth or data transmission capacity, but bps (bits per second) is used most often now and is more accurate.

BB – See Baseband.

BBC – See British Broadcasting Corporation.

BCH (Broadcast Channel) – The broadcast channel is a downlink UMTS (Universal Mobile Telecommunication System) transport channel that is used to broadcast cell and system information.

BCA (Burst Cutting Area) – A circular section near the center of a DVD disc where ID codes and manufacturer information can be inscribed in bar-code format.

BCD (Binary Coded Decimal) – A 4-bit representation of the 10 decimal digits "0" through "9". Six of the sixteen possible codes are unused. Two BDC digits are usually packed into one byte.

BCDM (Broadcast Cable Digital Multiplexer) – Provides off-line multiplexing of existing transport streams and TSMF information in order to produce ISDB-C streams (TSMF streams). It can also be used to demultiplex existing TSMF streams and enables the TSMF information to be edited.

B-Channel – A "bearer" channel in ISDN user-to-network interfaces carrying 64 kbps of digitized voice, video or data.

BDP (Body Definition Parameters) – Set of parameters used to define and to animate body objects. See also BAP.

BDR – See Border.

Beam – The directed flow of bombarding electrons in a TV picture tube.

Beam-Splitter Prism – The optical block in a video camera onto which three CCD sensors are mounted. The optics split the red, green and blue wavelengths of light for the camera.

Bearding – An overloading condition in which highly saturated or white areas of a television picture appear to flow irregularly into darker areas.

Beat Frequency – The difference between color subcarrier frequency and sound subcarrier frequency, expressed in Hz.

Beats – Variation in the amplitude of a mixture of two signals of close frequency as a result of constructive and destructive interference.

Bel – A measure of voltage, current or power gain. One bel is defined as a tenfold increase in power. If an amplifier increases a signal's power by 10 times, its power gain is 1 bel or 10 decibels (dB). If power is increased by 100 times, the power gain is 2 bels or 20 decibels. 3 dB is considered a doubling.

Bell Labs – Originally Bell Telephone Laboratories, the research arm of the Bell System. When AT&T divested itself of its regional telephone companies, Bell Labs was split. One division, still called Bell Labs, belongs to AT&T and is a proponent of a particular ATV system (SLSC). The other division, called Bellcore for short, belongs to the Bell regional holding companies (RHC) and is, among many other R&D projects, investigating mechanisms for reducing the bit rate of digital video transmission, which may be applicable to ATV. Bellcore has formed a joint venture with NHK for HDTV research.

Bellcore – See Bell Labs.

Benchmark – Method used to measure performance of a computer in a well-defined situation.

Bento – A registered trademark of Apple Computer, Inc. A general container format and software API (application programming interface). Bento is used by OMF interchange as a storage and access system for the information in an OMF interchange file.

BEP (Bit Error Probability)

BER – See Bit Error Rate.

Best Light – A telecine transfer performed with optimum settings of the color grade controls but without precise scene-by-scene color correction.

Betacam, SP – A superior performance version of Betacam, that uses metal particle tape and a wider bandwidth recording system. The interconnect standard is the same as Betacam, and there is also limited tape interchangeability with standard Betacam,.

Betacam, SX – A digital tape recording format developed by Sony which used a constrained version of MPEG-2 compression at the 4:2:2 profile, Main Level (422P@ML) using 1/2-inch tape cassettes.

Betacam, Betacam, Format – A camera/recorder system and related equipment originally developed by Sony, the name may also be used for just the recorder or for the interconnect format. Betacam, uses a version of the (Y, R-Y, B-Y) component set.

Betamax – Consumer videocassette record/playback tape format using half-inch wide magnetic tape. Developed by Sony, Betamax, was the first home VCR format.

Bezel – The frame that covers the edge of the picture tube in some TV sets and can therefore hide edge information transmitted in an ATV system (such as ACTV) not meant for the viewer to see. See also Overscanning.

Bézier – A curve that connects the vertices of a polygon; each vertex has two tangents, or handles, which you can use to adjust the slope of the adjacent curve or side of a polygon.

Bézier Spline – A type of smooth curve or surface bound to its control points, always passing through its first and last control point.

B-Frame (Bidirectional Frame) – The frame in an MPEG sequence created by comparing the difference between the current frame and the frames before and after it.

BG (Also BKG and BKGND) – See Background.

BH Loop Tracer – See BH Meter.

BH Meter – A device for measuring the intrinsic hysteresis loop of a sample of magnetic material. Usually, the sample is magnetized in a 60 Hz field supplied by a solenoid and the intrinsic flux is detected by integrating the emf produced in an opposing pair of search coils, one of which surrounds the sample. The hysteresis loop may be displayed on an oscilloscope by feeding the X and Y plates with voltages proportional to the magnetizing coil current and the integrated search coil emf respectively.

Bi O-L – Bi-Phase Level (Code). Also called Manchester (Code).

Bias – a) A steady-state signal applied to the tape (usually by a high frequency oscillation of 50 to 100,000 Hz or more) to minimize distortion and noise and increase frequency response and efficiency in recording. Every tape formulation has slightly different bias requirements. **b)** Current or voltage applied to a circuit to set a reference operating level for proper circuit performance, such as the high frequency bias current applied to an audio recording head to improve linear performance and reduce distortion.

Bias Adj. – The control which regulates the amount of bias mixed in with the signal to be recorded.

Bias Cal. – A control which calibrates the VU meter on a recorder so it reads 0 VU in the bias position of the output selector switch when bias is properly set.

Bias Switch – Switch used on cassette recorder to change the amount of bias current required for different types of tapes.

Bicubic Surface – A surface that you can add to a layer with four control handles that you can use for four-point tracking.

Bid Sheet – A written estimate, or quote, for video or production services.

Bidirectional – a) Indicates that signal flow may be in either direction. Common bidirectional buses are three-state or open collector TTL. **b)** In open reel or cassette recorders, the ability to play (and, in some cases, record) both stereo track pairs on a tape by reversing the tape's direction of motion without removing and replacing the tape reels or cassette.

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

BIFS (Binary Format for Scenes) – a) Describes the spatio-temporal arrangements of the objects in the scene. **b)** BIFS provides a complete framework for the presentation engine of MPEG-4 terminals. BIFS enables to mix various MPEG-4 media together with 2D and 3D graphics, handle interactivity, and deal with the local or remote changes of the scene over time. BIFS has been designed as an extension of the VRML 2.0 specification in a binary form.

Big Endian – A process which starts with the high-order byte and ends with the low-order byte. Motorola 68000 processors used the big endian format.

Bi-Level Keyer – A keyer where two levels of hole cutting are independently adjustable. The top level, or insert, cuts a hole and fills with the key video. In a luminance key the second level forms the border of the key, and in a chroma key the second level forms the shadow. The second level has adjustable luminance allowing borders to be varied from black to white and shadows to be varied in density. This is the type of keying provided on all Ampex switchers.

Bilinear Surface – A surface that you can add to a layer with more than four control handles for creating non-linear effects.

BIM (Broadcast Interface Module)

Bin – A database in which master clips, subclips, effects and sequences are organized for a project. Bins provide database functions to simplify organizing and manipulating material for recording, digitizing and editing.

Binary – A base-2 numbering system using the digits 0 and 1 (as opposed to 10 digits, 0-9) in the decimal system). In computer systems, the binary digits are represented by two different voltages or currents, on corresponding to 0 and the other corresponding to 1. All computer programs are executed in binary form. Binary representation requires a greater number of digits than the base 10 decimal system more commonly used. 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,

in binary: 10101111 x 11010100 = 10010000011101100
in decimal:175 x 212 = 37,100

From right to left, the digits represent 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768. Each digit is known as a bit. This example multiples two 8-bit number to produce a 16-bit result, a very common process in digital television equipment.

Binary File – An executable file that contains a relocatable machine code program; in other words, a program ready to be run.

Binary Search – Technique in which the search interval is divided by two at every iteration.

Binary Shape – A bit map that indicates the shape of a video object plane (VOP).

Binaural Effect – The human ability to localize the direction from which a sound comes due to the fact that people have two ears.

Binder – On recording tape, the binder is usually composed of organic resins used to bond the oxide particles to the base material. The actual composition of the binder is considered proprietary information by each magnetic tape manufacturer. The binder is required to be flexible and still maintain the ability to resist flaking or shedding binder material during extended wear passes.

BIOP (Broadcast Inter-Object Request Broker Protocol) – Defines a way of exchanging information in a broadcast carousel environment about an object, including a directory and broadcast file systems and information on the object itself. BIOP message contains an internationally agreed method to exchange information about an object being broadcast in a carousel. The BIOP may also indicate how to use the object, including possibly providing the application software.

BIOS (Basic Input/Output System) – Settings for system components, peripherals, etc. This information is stored in a special battery-powered memory and is usually accessible for changes at computer startup.

Bi-Phase – Electrical pulses from the tachometer of a telecine, used to update the film footage encoder for each new frame of film being transferred.

Bi-Phase Sync – Bi-phase is an older synchronization technology used in the film industry. Typically, the clock was derived from a box that hung off of large film mag recorders. This box emitted a pulse that provided sync. Working with pulses alone, bi-phase sync did not provide location information, making it a rather limited solution.

Bipolar – A signal containing both positive-going and negative-going amplitude. May also contain a zero amplitude state.

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

B-ISDN (Broadband Integrated Services Digital Network) – A mechanism by means of which telephone companies will be able to carry television signals (and, probably ATV signals) digitally, probably via optical fibers. ISDN systems are considered broadband if they carry at least 45 Mbps, the DS3 rate, currently used for delivery of broadcast television signals. If and when B-ISDN reaches homes it will be a powerful competitor to other delivery mechanisms, potentially able to perform a computer-television function.

Bit (Binary Digit) – a) A single digit in a binary number. **b)** A binary representation of 1 or 0. One of the quantized levels of a pixel. **c)** An instruction in a data transmission, usually part of a word (byte) with high status = 1, and low status = 0. d) An eight-bit byte can define 256 brightness or color values.

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 – See Packing Density.

Bit Depth – The number of levels that a pixel might have, such as 256 with an 8-bit depth or 1024 with a 10-bit depth.

Bit Error – The incorrect interpretation of a binary bit by a message processing unit.

Bit Error Rate (BER) – a) This term is used in High Density Digital Recording (HDDR), or High Density Recording (HDR), or other such names and refers to the number of errors a specific magnetic tape may contain, and is expressed in errors per data bits, such as one in 106 or one error in one million data bits. **b)** The average probability of a digital recording system reproducing a bit in error. Note: IEEE 100 defines error rate as "the ratio of the number of characters of a message incorrectly received to the number of characters of the message received". Bit error rates typical of current digital tape recording are: digital video tape, about 106; digital instrumentation tape, about 109; digital computer tape, about 1012.

Bit Packing Density – The number of bits recorded per track length unit, usually expressed in terms of kilobits per inch (KBPI) or bits per millimeter (BPMM).

Bit Parallel – Byte-wise transmission of digital video down a multi-conductor cable where each pair of wires carries a single bit. This standard is covered under SMPTE125M, EBU 3267-E and ITU-R BT.656 (CCIR 656).

Bit Plane – Video RAM containing formatted graphics data for VGA and SVGA systems where four or more bit planes can be addressed in parallel. A bit plane is sometimes called a map.

Bit Rate – a) The rate at which the compressed bit stream is delivered from the storage medium to the input of a decoder. The digital equivalent of bandwidth. **b)** The speed at which bits are transmitted, usually expressed in bit per second (IEEE 100). Video information, in a digitized image for example, is transferred, recorded, and reproduced through the production process at some rate (bits/s) appropriate to the nature and capabilities of the origination, the channel, and the receptor. **c)** The amount of data transported in a given amount of time, usually defined in Mega (million) bits per second (Mbps). 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. MPEG-1 has a bit rate of 1.2 Mbps.

Bit Rate Reduction – a) Schemes for compressing high bit rate signals into channels with much lower bit rates. **b)** A reduction in the real-time transmission rate in digital format, usually to facilitate recording, transmission, broadcast, display, etc., or even to comply with fixed limitations. Various algorithms appropriate for video signals may be employed from arbitrary resampling to more complex processing with the objective of reducing the transmission of redundant information in the image and possibly eliminating image content that will not be obvious in the final specified display. Bit rate reduction is also appropriate and employed in audio records, either associated with video or standing alone.

Bit Rate, Real-Time – When the information is obtained from a continuously varying source, and the information is being transmitted continuously without buffering, it is exchanged at the real-time bit rate. Within the production sequence, it is actually only the image capture (i.e., camera and its recording system) that is required to be in real-time. The balance of production, including post-production operations, can be at a fraction of real-time if a more desirable result is achieved. (Subsequent to production, the final display must of course also be in real-time.)

Bit Rate, Recording – The bit rate required of a recorder mated to a video camera or functioning in the origination, post-production, or distribution is generally greater than the concurrent bit rate, real-time because of the error correction designed into the recording format. This "overhead" may increase the bit rate, sometimes by as much as one-third, and frequently sets a practical limit in systems design. Examples in the following table are intended only to clarify the definition. They indicate the range of some systems currently considered and a first estimate of their challenges.

Probable Recording Rate, Mbits/s (1, 2)

Bits Per Pixel	Maximum Levels Defined	CCIR Rec 601-2 (3) 4:2:2	CCIR Rec 601-2 (3) 4:4:4	CCIR Rec 709 (3) 4:2:2	CCIR Rec 709 (3) 4:4:4
8 (3)	256	227 (4)	340	1290	1940
10	1024	284	426	1610	2420
12	4096	340	510	1940	2910

(1) All systems postulated employ field rates of 60 or 59.94 Mbits/s, component encoding and 2:1 interlace. Progressive scan systems at the same frame rates would have double these bit rates.
(2) Estimates for gross data recording rates assume the same ratio of overhead to data bits in component format recording as that in the D-1 standard.
(3) CCIR Recommendations 601-2 and 709 document 8-bit and 10-bit sampling, based upon sampling frequencies that are integral multiples of 2.25 MHz (i.e., 13.5 MHz for Rec 601-2).
(4) The D-1 standard recording format is defined by SMPTE 224M and its related SMPTE Recommended Practices and Engineering Guidelines.

Bit Serial – Bit-wise transmission of digital video down a single conductor such as coaxial cable. May also be sent through fiber optics. This standard is covered under ITU-R BT.656 (CCIR 656).

Bit Slip – The condition in a message processing unit where the bit rate clock has gained (or lost) more than 180 degrees phasing with respect to synchronism with the binary message bits.

Bit Slippage – a) Occurs when word flaming 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, TRS-ID for composite and EAV/SAV for component. **b)** The erroneous reading of a serial bit stream when the recovered clock phase drifts enough to miss a bit. **c)** A phenomenon which occurs in parallel digital data buses when one or more bits gets out of time in relation to the rest. The result is erroneous data. Differing cable lengths is the most common cause.

Bit Specifications – Number of colors or levels of gray that can be displayed at one time. Controlled by the amount of memory in the computer's graphics controller card. An 8-bit controller can display 256 colors or levels of gray; a 16-bit controller, 64,000 colors; a 24-bit controller, 16.8 million colors.

Bit Stream (also Bitstream) – a) A continuous series of bits transmitted on a line. **b)** A binary signal without regard to grouping according to character.

Bit Synchronizer – An information processing unit intended to extract the binary message and associated bit rate clock included in a PCM signal.

BitBLT (Bit Block Transfer) – The transfer of blocks of screen data (rather than a byte at a time) from one place to another in memory. The microprocessor tells the graphic chip what block to move and where to put it. The graphics chip carries out this operation freeing the microprocessor to work on the next operation.

BITC – See Burn In Time Code.

Bitmap (BMP) – a) A bitmap is the digital representation of an image, in terms of pixel values. Storing an image as a bitmap is the most space-consumptive method of storing an image. **b)** An image consisting of an array of pixels that can be displayed on a computer monitor. **c)** A pixel-by-pixel description of an image. Each pixel is a separate element. Also a computer file format.

Bitmapped Graphics – Images, which are created with matrices of pixels, or dots. Also called Raster Graphics.

Bits Per Pixel (BPP) – The number of bits used to represent the color information of a pixel. One bit allows only two values (black and white), two bits allows four values, and so on. Also called color depth or bit depth.

Bit-Slice – Method that implements n-bits of the CPU on each of several chips, or slices, usually n=4. A bit-slice processor chip implements a complete data path across the CPU. A 32-bit processor could be constructed by using eight 4-bit CPU slices.

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

Black (BLK) – A black video output generated within the switcher and selected by the Black push-buttons on the crosspoint buses and by the Fade to Black push-button in the downstream mixer.

Black A Tape – The process of recording a black burst signal across the entire length of a tape. Often done before recording edited footage on the tape to give the tape clean, continuous video and sync and to insure there is no video already on the tape.

Black and Code – Video black, timecode and control track that are prerecorded onto videotape stock. Tapes with black and code are referred to as striped or blacked tapes.

Black and White – Monochrome or luminance information. Monochrome means one color. In the color television system the black and white portion of the picture has to be one "color" gray, D6500, 6500°K as defined by x and y values in the 1939 CIE color coordinate system. The black and white signal in the S or Component video path is separate from the color information.

Black Box – A term used to describe a piece of equipment dedicated to one specific function, usually involving a form of digital video magic.

Black Burst – a) Black burst is a composite video signal consisting of all horizontal and vertical synchronization information, burst and in North America NTSC, setup. Also called "color black", "house sync" or "house black". Typically used as the house reference synchronization signal in television facilities. **b)** A composite color video signal. The signal has composite sync, reference burst and a black video signal, which is usually at a level of 7.5 IRE (50 mV) above the blanking level.

Black Compression – a) The reduction in gain applied to a picture signal at those levels corresponding to dark areas in a picture with respect to the gain at that level corresponding to the midrange light value in the picture. **b)** Amplitude compression of the signals corresponding to the black regions of the picture, thus modifying the tonal gradient.

Black Edits – a) A video source with no image. **b)** A special source you can fade into, out of, or use for other effects.

Black Level – a) This voltage defines the picture's black level. Video that dips below this level such as sync pulses are called blacker then black. **b)** Strictly interpreted, denotes the light level at which a video signal representing picture black is reproduced on your TV screen. In terms of light output from a TV set, black areas of the picture should be represented by an absence of light. Something that is black or below black in the video signal shouldn't produce any light from the display. **c)** Some TV sets actually use Black Level as a control name. It is a far better description of the function than the most commonly found name for it, Brightness. **d)** A part of the video signal, close to the sync level, but slightly above it (usually 20 mV – 50 mV) in order to be distinguished from the blanking level. It electronically represents the black part of an image, whereas the white part is equivalent to 0.7 V from the sync level.

Black Level Setup – Refer to the Setup discussion.

Black Level, Monitor – The luminance produced on the monitor display by a signal at reference black level. Since the monitor brightness control should be adjusted to align CRT beam cutoff with reference black level signal, this provides zero excitation light from the CRT (only room ambient light reflected from the CRT faceplate). Monitor black level is normally set by use of a pluge signal to adjust CRT beam cutoff subjectively.

Black Level, Reference – The video signal level which is intended to produce monitor black level in the reproduced image. In systems with a setup level, i.e., the 7.5 IRE setup in a 525/59.94/2:1/NTSC composite video documented by ANSI/EIA TIA 250-C and SMPTE 170M, reference black is at the setup level. In systems with no setup level, reference black is at blanking level.

Black Peak – The maximum excursion of the picture signal black direction at the time of observation.

Black Point – The luminance value in a video image that you set to be equal to reference black when making a color adjustment. Compare with White Point.

Black Stripe – See Striping.

Black to White Excursion – The excursion from reference black to reference white. Conventionally 92.5 IRE (37/56 V or 660 mV); System M and EIA-343A 100 IRE (or 700 mV) in other analog systems and codes 16-235 in component digital systems.

Black, Absolute – a) Optical black is no light. An absolute black can only be produced in a scene via a light-trap, "a black hole". **b)** A capped lens on the camera is the equivalent of an absolute scene black and should produce reference black level video signal from a properly adjusted studio camera.

Black, Projection – The luminance level in a projected image that is correlated with subjective scene black has two sources: in photographic and other light-modulating systems there will be luminance from whatever transmitted light passes through the maximum modulating density representing scene black, additional luminance may be produced by nominate-forming light (flare, room illumination, stray light, etc.).

Black, Subjective, Monitor – The luminance level which produces the perception of black on the monitor display. This subject has not been explored extensively, but Bartleson and Novick present evidence that it is relative to the high-light or white level, such that the luminance ratio to produce subjective black on a monitor is higher than that in a televised scene. They propose a luminance ratio of 100:1 for subjective white to black on TV monitors in a control room "dimly lighted". This luminance ratio specification has been formalized in SMPTE RP 166.

Black, Subjective, Scene – That fraction of the high-light luminance required in a scene reproduced on a television display to convey the perception of black. The luminance of subjective black on a CRT has been studied by Lowry and Jarvis, who measured luminances on the original scenes, and compared the subjective appearance on a CRT display, as evaluated by viewing audiences. They found that the perception of black depends on a great many factors both in the reproduced scene and in the viewing conditions such as average scene reflection, luminance of areas adjacent to the display, etc. In most situation, luminance levels of 1/40 to 1/60 of the highlight luminance produce the perception of black even though the scene luminance range may reach 200:1 or more. It follows then that a scene element that is perceived as black may not necessarily be at reference black level in a video signal.

Blacked Tapes – See Black and Code.

Blacker-than-Black – The amplitude region of the composite video signal below reference black level in the direction of the synchronizing pulses.

Blackout – The fading of a video signal to black to indicate, for example, the end of a show.

Blanket Fee – Typically used for musical selections. One who pays a blanket fee has permission to use the musical selection the fee covers in an unlimited number of released projects and videos.

Blanking – A video signal level below which no light should be emitted from a TV screen (the level at which the screen is blanked); also, that portion of the time that a video signal is transmitted when it is at or below blanking. These time portions can be divided into a horizontal blanking interval (HBI) and a vertical blanking interval (VBI). Since no picture information is carried in either blanking interval in an NTSC signal, various ATV schemes propose using them for carrying augmentation information, such as higher quality sound or widescreen panel information. Potentially conflicting with those schemes are other schemes that already use the blanking intervals for descrambling codes, test transmission, time code, and test and reference signals. Reducing the duration of the blanking intervals

to allow more picture information to be transmitted potentially conflicts with the demands of the scanning circuitry of older TV sets. Sometimes this conflict is said to be resolved by bezel coverage and overscanning.

Blanking (Picture) – The portion of the composite video signal whose instantaneous amplitude makes the vertical and horizontal retrace invisible.

Blanking Adjustment – A technique proposed in some ATV schemes to increase the VBI (and, sometimes, decrease the HBI) to deal with wide aspect ratios. See also Burn.

Blanking Interval – The horizontal blanking interval is the time between the end of one horizontal scanning line and the beginning of the next. The vertical blanking interval is the time between the end of one video field and the beginning of the next. Blanking occurs when a monitor's electron beam is positioned to start a new line or a new field. The blanking interval is used to instantaneously reduce the beam's amplitude so that the return trace is invisible.

Blanking Level – a) Refers to the 0 IRE level which exists before and after horizontal sync and during the vertical interval. This voltage level allows the electron beam to be turned off while it is being repositioned (retracing) across the face of the CRT into the position needed to start tracing the next visible line. **b)** The level of the front and back porches of the composite video signal. **c)** The level of a composite picture signal which separates the range containing picture information from the range containing synchronizing information. Note: This term should be used for controls performing this function (IEEE 100). **d)** The beginning of the video signal information in the signal's waveform. It resides at a reference point taken as 0 V, which is 300 mV above the lowest part of the sync pulses. Also known as pedestal, the level of a video signal that separates the range that contains the picture information from the range that contains the synchronizing information.

Blanking Panel – A piece of black plastic attached to the front plastic panel of the Indigo chassis that covers either the top or middle drive slot. The blanking panel is removed after installing a drive in the slot that it was covering.

Blanking Processor (Sync Proc) – A circuit on the video module which strips blanking sync and burst from the program output of the switcher and replaces it with blanking and sync from a reference source. This process ensures that sync and blanking do not contain any unwanted timing shifts, and the record VPR is always receiving constant relationships of sync, blanking and burst.

Blanking Stuffing – An ATV technique that adds information to blanking areas that is supposed to be invisible to ordinary sets but can be used by an ATV set for increased resolution and/or widescreen panels.

Blast Filter – A dense mesh screen on a microphone, which minimizes overload caused by loud, close sounds.

Bleach – a) Converting a metallic silver image to a halide or other salt which can be removed from the film with hypo. When bleaching is not carried to completion, it is called reducing. **b)** Any chemical reagent that can be used for bleaching.

Bleeding Whites – An overloading condition in which white areas appear to flow irregularly into black areas.

Blink – A modification to a key to cause it to flash on and off. The speed at which a key blinks.

Blitting – The process of using BitBLT to copy video data such as a bitmap from one area in memory to another.

Block – An 8-row by 8-column matrix of pels, or 64 DCT coefficients (source, quantized or dequantized). A block is the entity on which the DCT operates and it represents luminance or chrominance information. This term is used for both the actual picture information, and the corresponding DCT coefficients.

Block Companding – Digital representation of an audio signal that has been normalized within a certain time period.

Block Matching – A method of motion estimation. A search for the picture area that best matches a specific macro block of preceding and/or subsequent pictures.

Blockiness – An artifact that refers to the tile-like appearance of a compressed image where the 8 x 8 blocks have become visible due to a (too) hard compression.

Blocking – a) Occurs in a multistage routing system when a destination requests a source and finds that source unavailable. In a tie line system, this means that a destination requests a tie line and receives a tie line busy message, indicating that all tie lines are in use. **b)** Distortion of the received image characterized by the appearance of an underlying block encoding structure.

Blooming – a) This effect is sometimes called whiter-than-white. Blooming occurs when the white voltage level is exceeded and screen objects become fuzzy and large. **b)** The defocusing of regions of a picture where brightness is excessive.

BLT (Block Transfer) – The process of moving blocks of data from one place to another rather than a byte at a time in order to save processor time and to expedite screen display in operations such as vertical rolling of video.

Blue Aging – A tendency for blue phosphors to age more rapidly than red or green. See also Phosphor Aging.

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

Blue Screen – A special effects procedure in which a subject is photographed in front of a uniformly illuminated blue or green background. A new background image can be substituted for the blue or green during the shoot or in post-production through the use of chroma key.

Blur – A state of reduced resolution. Blur can be a picture defect, as when a photograph is indistinct because it was shot out of focus or the camera was moved during exposure. Blur can also be a picture improvement, as when an unnaturally jagged-edged diagonal line or jerky motion is blurred to smoothness.

Blurring/Smearing – In a single frame (spatial example), reducing the number of pixels per horizontal line, causes a blurring or smearing effect. In multiple frames (temporal example), the causes become more complicated. They may include reduction of bandwidth, degree of image movement, algorithm type, and motion prediction/compensation techniques.

B-MAC – A MAC (Multiplexed Analog Component) with audio and data time multiplexed before modulation, which forms the basis for the HDB-MAC ATV scheme, currently used for satellite transmission and scrambling in the U.S.. See also MAC.

B-Mode – A "checkerboard" or non-sequential method of assembly. In B-mode, the edit decision list (EDL) is arranged by source tape number. The edit system performs all edits from the tapes currently assigned to decks, leaving gaps that will be filled by material from subsequent reels. See also A-Move, C-Mode, D-Mode, E-Mode, Source Mode.

B-Mode Edit – An editing method where the footage is assembled in the order it appears on the source reels. Missing scenes are left as black holes to be filled in by a later reel. Requires fewer reel changes and generally results in a faster edit session.

BMP – A bitmapped graphic files format for Windows which stores images as a grid of dots or pixels. The BMP file defines the size of the image, the number of color planes, and the palette used.

BNC – A cable connector used extensively in television and is an abbreviation that has several different meanings depending on who you ask. Four common meanings for BNC are listed below: **B**aby **N** **C**onnector, **B**ayonet **N**eill **C**oncelman Connector, **B**ritish **N**aval **C**onnector, and **B**ritish **N**ational **C**onnector.

Board – The audio console control in radio and television.

Board Fade – A radio term, used to designate the process of gradually fading the volume of sound by means of a master fading control on the board.

Board Tester – Product programmed to automatically stimulate the circuits on a PC board and check the responses. Electrical failures can be detected and diagnosed to facilitate board repair.

BOC (Bell Operating Company) – A local telephone company formerly owned by AT&T.

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

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

Book C – The document specifying the DVD-Audio format.

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

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

Boolean – In digital picture manipulation, a method of working on polygonal objects.

Boolean Logic – Named after George Boole, who defined binary arithmetic and logical operations such as AND, OR, NOT, and XOR.

Boom – A mechanical cantilevering device used to hold a microphone closer to a set by positioning it above the set while keeping it out of view of the cameras.

Boot – To start up the system by turning on the workstation and monitor; the system is fully booted when you see a prompt or the login screen. Short for Bootstrap.

Boot Up – To start up. Most computers contain a system operating program that they load into memory from disk after power up or restart. The process of reading and running that program is called boot up.

Bootstrap – Program used to initialize the computer. Usually clears memory, sets up I/O devices, and loads the operating system.

Border – a) The boundary between two merged video pictures, as created with chroma key or wipe effects. **b)** May be thought of as the frame which surrounds a given pattern or key. In the case of a key, the border is on or two lines side, adjustable anywhere from black to white, and may be symmetrical about the key or to the right and bottom (drop shadow). An outline is a special key border where the insert video appears in the border area and the background video fills the hole where the insert would normally be. In the case of a pattern, the border is adjustable in width and color. A pattern border may be hard colored, soft colored (halo), or soft with no color. AVC switchers can also do half halo borders, hard on one side and soft on the other.

Border (Key) – A title (caption, super) enhancement option which produces a black or white border or dropshadow around a key or changes the key into a matte filled outline in the shape of the key. The Border, Dropshadow, and Outline push-buttons select these optional modes. If the Border option is not installed, these push-buttons do not function.

Border (Menu) – A function that uses ADO 100's internal key to place a border around the image and adjust width and color (saturation, luminance and hue).

Border (Wipe) – The boundary area between the "A" video and "B" video when doing a wipe, to which hard, soft, halo or 1/2 halo edges and matte color can be added.

Border Luminance – The brightness of a border.

Border Modify – A feature exclusive to AVC series switchers, allowing key borders to be extended to the right and bottom up to 14 lines deep. Several special key effects can be accomplished with this including delayed and decayed keys.

Border Modify (Key) – An enhancement to the basic key border function allowing up to 14 lines of dropshadow or reinserted insert video in a decaying mode. This uses a patented circuit which increases the creative possibilities.

Bottom Field – One of two fields that comprise a frame of interlaced video. Each line of a bottom field is spatially located immediately below the corresponding line of the top field.

Bounce – a) An unnatural sudden variation in the brightness of the picture. **b)** Oscillations and noise generated when a mechanical switch is opened or closed. See Debounce.

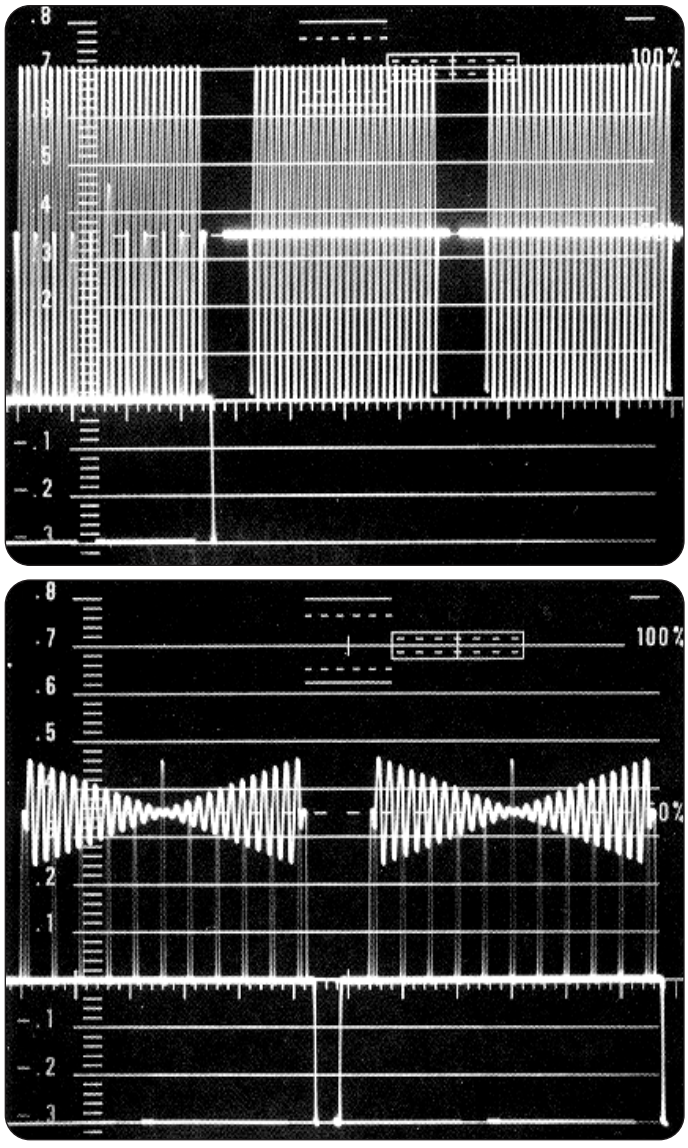
Boundary Representation Modeling – This modeling technique defines a world in terms of its edges. The primary components of a boundary rep world are vertices and polygons. PictureMaker is a boundary rep system.

Bounding Box – A relatively simple object, usually a rectangle or box with the overall dimensions, or bounds, of a more complex object. A bounding is used in place of that exact, more complex, modeled shape to represent it in an animation preview, or to predict the inclusion of that object in the scene. This reduces the calculation/production time and expense when

previewing computer animation sequences to check continuity, positions, and timing.

Bouquet – a) A group of transport streams in which programs are identified by a combination of network ID and PID (part of DVB-SI). **b)** A collection of services marketed as a single entity.

Bowtie Test Signal – Each of three component signals is fed to a different channel of the CAV system and used to evaluate the relative amplitudes and relative timing on some CAV waveform monitors. In standard definition the first signal is a 500 kHz sine wave packet, which is fed to video channel 1. The other two signals are identical 502 kHz. The three sine wave packets are generated to be precisely in phase at their centers. Because of their 2 kHz offset, the color difference channels become increasingly out of phase with the luminance channel on either side of center. If the three signals are properly timed, their sum results in the bowtie waveform.



Box – Electronic equipment used to process television signals in a consumers' home, usually housed in a "box" that sits atop a TV set or VCR.

Box House – A slang term for a mail-order business for audio and video components. Box houses frequently offer little or no consumer support or equipment repair.

BPF – See Bandpass Filter.

BPI – Bits per linear inch down a recorded track.

B-Picture (Bidirectionally Predictive-Coded Picture) – An MPEG picture that is coded using motion compensated prediction from past and/or future reference pictures. Motion vectors pointing forward and backwards are used, and they may point at either I-pictures or P-pictures. The B-pictures provide the highest compression, but demand knowledge of several pictures. Consequently, B-pictures give a higher delay and call for a larger picture memory. B-pictures are never used as a reference in a prediction. When B-pictures are part of a sequence, the pictures are not sent in chronological order owing to the fact that future P-pictures and/or I-pictures are needed (and therefore must be decoded) for the decoding of B-pictures. The P- and I-pictures have to be sent earlier than the actual point of time to which they relate.

BPS – Abbreviation for Bits Per Second.

BPSK (Binary Phase Shift Keying) – A modulation technique that has proven to be extremely effective for LowFER and MedFER operation, as well as for amateur HF work.

BR (Radiocommunication Bureau) – The Radiocommunication Bureau (BR), the executive arm of the Radiocommunication Sector, is headed by a Director who organizes and coordinates the work of the Radiocommunication Sector.

BRA (Basic Rate Access) – Two 64 kbps B channels + one 16 kbps D channel (2B + D), carrying user traffic and signaling information respectively to the user via twisted pair local loop.

Braid – A group of textile or metallic filaments interwoven to form a tubular structure that may be applied over one or more wires or flattened to form a strap.

Branch – See Jump.

Break Elongation – The relative elongation of a specimen of magnetic tape or base film at the instant of breaking when it has been stretched at a given rate.

Breakdown – A written accounting of the shooting schedule and production resources.

Break-Down – The separation of a roll of camera original negative into its individual scenes.

Breakpoint – a) A break in the smoothness of a curve. **b)** Software or hardware device that stops the program and saves the current machine status, under user-specified conditions.

Breakup – Disturbance in the picture or sound signal caused by loss of sync or by videotape damage.

Breathing – Amplitude variations similar to "bounce" but at a slow, regular rate.

Breezeway – The portion of the video signal which lies between the trailing edge of the horizontal sync pulse and start of burst. The Breezeway is part of the back porch. Also refer to the Horizontal Timing discussion.

Bridge – Bridges are devices that connect similar and dissimilar LANs at the Data Link Layer (OSI layer 2), regardless of the Physical Layer protocols or media being used. Bridges require that the networks have consistent addressing schemes and packet frame sizes. Current introductions have been termed learning bridges since they are capable of updating node address (tracking) tables as well as overseeing the transmission of data between two Ethernet LANs.

Brightness – a) Overall DC voltage level of the video signal. The brightness control is an adjustment of setup (black level, black reference). **b)** Attribute of a visual sensation according to which an area appears to emit more or less light. The subjective counterpart of objective luminance. **c)** The value of a pixel along the black-white axis. **d)** In NTSC and PAL video signals, the brightness information at any particular instant in a picture is conveyed by the corresponding instantaneous DC level of active video. Brightness control is an adjustment of setup (black level, black reference).

Brightness Signal – Same as the luminance signal (Y). This signal carries information about the amount of light at each point in the image.

Broad Pulses – Another name for the vertical synchronizing pulses in the center of the vertical interval. These pulses are long enough to be distinguished from all others and are the part of the signal actually detected by vertical sync separators.

Broadband – a) A response that is the same over a wide range of frequencies. **b)** capable of handling frequencies greater than those required for high-grade voice communications (higher than 3 to 4 kilohertz).

Broadcast – A one-to-many transmission of information that may be simultaneously received by many, but unknown, receivers.

Broadcast Communications System – A network such as a cable system capable of delivering multiple high capacity services simultaneously.

Broadcast Monitor – Television set without receiving circuitry, wired directly to a VTR or other output device.

Broadcast Quality – a) A nebulous term used to describe the output of a manufacturer's product no matter how bad it looks. **b)** A standard of 525 lines of video picture information at a rate of 60 Hz – NTSC in the USA; or 625 lines at a rate of 50 Hz – PAL in Europe (except France). **c)** A quality standard for composite video signals set by the NTSC and conforming to FCC rules. When recording video signals or videotape for broadcast, it is important to note that devices providing NTSC signals do not necessarily meet FCC broadcast standards.

Broadcast Television – Conventional terrestrial television broadcasting, the most technically constrained delivery mechanism for ATV, faced with federal regulations and such potential problems as multipath distortion and co-channel interference.

Broadcaster (Service Provider) – An organization which assembles a sequence of events or programs to be delivered to the viewer based upon a schedule.

B-Roll – a) Off the shelf video sequences for various needs. **b)** Refers to secondary or duplicated footage of a fill or secondary nature usually played from the B source player in an A/B roll linear editing system. B-roll does not refer to all tapes played from the B source player.

Brouter – Brouters are bridge/router hybrid devices that offer the best capabilities of both devices in one unit. Brouters are actually bridges capable of intelligent routing and therefore are used as generic components to integrate workgroup networks. The bridge function filters information that remains internal to the network and is capable of supporting multiple higher-level protocols at once. The router component maps out the optimal paths for the movement of data from one point on the network to another. Since the brouter can handle the functions of both bridges and routers, as well as bypass the need for the translation across application protocols with gateways, the device offers significant cost reductions in network development and integration.

Brown Stain – A non-magnetic substance that forms on that area of a magnetic head's surface over which tape passes. Its origin is not well understood but it is known to occur primarily in the presence of low humidity.

Browse – To scan a database or a list of files, either for a particular item or for anything that seems to be of interest. Browsing implies observing rather than changing information.

Browse Station – A viewing station that provides browsing of stored images or video. Browse stations are internal and connected via ethernet.

BRR – See Bit Rate Reduction.

Bruch Blanking – A 4-field burst blanking sequence employed in PAL signals to ensure that burst phase is the same at the end of each vertical interval.

BS – Bandwidth of the frequency slot allocated to a service.

BS.707 – This ITU recommendation specifies the stereo audio specifications (Zweiton and NICAM 728) for the PAL and SECAM video standards.

BS1, BS2, BS3 – DBV-RCT burst structures for data transmission.

BSI (British Standards Institution) – The British Standards Institution was the first national standards body in the world. There are now more than 100 similar organizations which belong to the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

BSLBF (Bit String, Left Bit First) – Bit string, left bit first, where "left" is the order in which bit strings are written in ISO/IEC 11172. Bit strings are written as a string of 1s and 0s within single quote marks, e.g. '1000 0001'. Blanks within a bit string are for ease of reading and have no other significance.

B-Spline – a) A type of smooth curve (or surface) bound to its control points. **b)** A smooth curve that passes on the inner side of the vertices of a polygon to connect the vertices to interpolate or draw the polygon. **c)** A curve used to define a motion path.

BSS (Broadcast Satellite Services) – Typically used to refer to a range of frequencies intended for direct reception of satellite television and entertainment services. These frequencies are subject to internationally-agreed upon regulations that govern their use and are designed to ensure that all countries are able to offer services of this nature.

BST-OFDM – See Bandwidth Segmented Orthogonal Frequency Division Multiplexing.

BT.1119 – Defines the widescreen signaling (WSS) information for NTSC and PAL video signals. For (B, D, G, H, I) PAL systems, WSS may be present on line 23, and on lines 22 and 285 for (M) NTSC.

BT.1124 – Defines the ghost cancellation reference (GCR) signal for NTSC and PAL.

BT.1197 – Defines the PALplus standard, allowing the transmission of 16:9 programs over normal PAL transmission systems.

BT.1302 – Defines the transmission of 16:9 BT.601 4:2: YCbCr digital video between pro-video equipment. It defines a parallel interface (8-bit or 10-bit, 36 MHz) and a serial interface (360 Mbps).

BT.1303 – Defines the transmission of 16:9 BT.601 4:4:4:4 YCbCr and RGBK digital video between pro-video equipment. Two parallel interfaces (8-bit or 10-bit, 36 MHz) or two serial interfaces (360 Mbps) are used.

BT.1304 – Specifies the checksum for error detection and status for pro-video digital interfaces.

BT.1305 – Specifies the digital audio format for ancillary data for pro-video digital interfaces. See also SMPTE 272M.

BT.1358 – 720 x 480 (59.94 Hz) and 720 x 576 (50 Hz) 4:2:2 YCbCr pro-video progressive standards. See also SMPTE 293M.

BT.1362 – Pro-video serial interface for the transmission of BT.1358 digital video between equipment. Two 270 Mbps serial interfaces are used.

BT.1364 – Specifies the ancillary data packet format for pro-video digital interfaces. See also SMPTE 291M.

BT.1365 – Specified the 24-bit digital audio format for pro-video HDTV serial interfaces. See also SMPTE 299M.

BT.1366 – Specifies the transmission of timecode as ancillary data for pro-video digital interfaces. See also SMPTE 266M.

BT.1381 – Specifies a serial digital interface-based (SDI) transport interface for compressed television signals in networked television production based on BT.656 and BT.1302.

BT.470 – Specifies the various NTSC, PAL and SECAM video standards used around the world. SMPTE 170M also specifies the (M) NTSC video standard used in the U.S.. BT.470 has replaced BT.624.

BT.601 – 720 x 480 (59.94 Hz), 960 x 480 (59.94 Hz), 720 x 576 (50 Hz) and 960 x 576 (50 Hz) 4:2:2 YCbCr pro-video interlaced standards.

BT.653 – Defines the various teletext standards used around the world. Systems A, B, C and D for both 525-line and 625-line TV systems are defined.

BT.656 – Defines a parallel interface (8-bit or 10-bit, 27 MHz) and a serial interface (270 Mbps) for the transmission of 4:3 BT.601 4:2:2 YCbCr digital video between pro-video equipment. See also SMPTE 125M.

BT.709 – This ITU recommendation specifies the 1920 x 1080 RGB and 4:2:2 YCbCr interlaces and progressive 16:9 digital video standards. Frame refresh rates of 60, 59.94, 50, 30, 29.97, 25, 24 and 23.976 Hz are supported.

BT.799 – Defines the transmission of 4:3 BT.601 4:4:4:4 YCbCr and RGBK digital video between pro-video equipment. Two parallel interfaces (8-bit or 10-bit, 27 MHz) or two serial interfaces (270 Mbps) are used.

BTA – Japan's Broadcast Technology Association. A national standards-making organization comprising manufacturers and broadcasters, not unlike SMPTE. A proponent of an ATV system.

BTS (Broadcast Television Systems) – A joint venture of Bosch Fernseh and Philips established to sell television production equipment. BTS offers the first multi-standard HDTV camera.

BTSC – This EIA TVSB5 standard defines a technique of implementing stereo audio for NTSC video. One FM subcarrier transmits a L+R signal, and an AM subcarrier transmits a L-R signal.

Buckling – Deformation of the circular form of a tape pack which may be caused by a combination of improper winding tension, adverse storage conditions and/or poor reel hub configuration.

Buffer – a) An IC that is used to restore the logic drive level. **b)** A circuit or component that isolates one electrical circuit from another. **c)** A digital storage device used to compensate for a difference in the rate of flow of information or the time of occurrence of events when transmitting information from one device to another. **d)** In telecommunications, a protective material used in cabling optical fiber to cover and protect the fiber. The buffer material has no optical function.

Buffer Control – The feedback algorithms used by the encoder to avoid overflow of the video rate buffer. The video rate buffer is a FIFO which holds the coded video prior to output into the channel.

Buffer Model – A model that defines how a terminal complying with this specification manages the buffer resources that are needed to decode a session.

Bug – An error in a computer program. Eliminating errors is known as debugging.

Built-In Reference Tones – Refers to adjustment tones which are available within the recorder for adjusting record level and bias.

Bulk Eraser – A device used to erase an entire tape at one time. Bulk erasers are usually more effective than recorders' erase heads.

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.

Bumping Up – Transferring a program recorded on a lower quality videotape to a higher quality videotape (e.g., from Hi-8 to Betacam). Bumping up to a higher format allows footage to be preserved on a more stable tape format and makes it possible to edit in a higher-end editing environment.

Burn – An image or pattern appearing so regularly on the screen of a picture tube that it ages the phosphors and remains as a ghost image even when other images are supposed to be shown. On computer terminals, the areas occupied by characters are frequently burned, particularly in the upper left corner. In television transmission centers, color bars are sometimes burned onto monitors. There is some concern that some ATV schemes will burn a widescreen pattern on ordinary TV sets due to increased vertical blanking or will burn a non-widescreen pattern on ATV sets due to reception of non-ATV signals. In production, refers to long-term or permanent image retention of camera pickup tubes when subjected to excessive highlights.

Burned-In Image – An image which persists in a fixed position in the output signal of a camera tube after the camera has been turned to a different scene.

Burned-In Time Code (BITC) – Time code numbers that are superimposed on the picture. This is time code that is displayed on the monitor along with the video it pertains to. BITC can either be Vertical Interval Time Code (VITC) or Longitudinal Time Code (LTC).

Burn-In – a) Component testing method used to screen out early failures by running the circuit for a specified length of time. **b)** A visible time code permanently superimposed on footage, usually in the form of white numbers in a black rectangle.

Burn-In Dub – A duplicate of an original or master tape that includes the time code reference on-screen and is used as a reference for logging and locating scenes.

Burst – A small reference packet of the subcarrier sine wave, typically 8 or 9 cycles, which is sent on every line of video. Since the carrier is suppressed, this phase and frequency reference is required for synchronous demodulation of the color information in the receiver. Refer to the Horizontal Timing discussion.

Burst Gate – This signal tells the receiver valid color ready for use.

Bus – a) Any row of video crosspoints that allow selection of various sources to be selected, and the associated row of buttons for such selection. Buses are usually associated with a given M/E or the DSK although they may be independent as in aux buses. Also, any row of video or key source selections which may or may not be selected by push buttons on a bus row. For example, key video selections on Ampex switchers appear on buses which are accessed and selected by keypads. Due to the fact that there is no associated row of buttons, this arrangement is called a "phantom bus". **b)** A parallel data path in a computer. **c)** In computer architecture, a path over which information travels internally among various components of a system and is available to each of the components.

Bus Address – A code number sent out to activate a particular device on a shared serial or parallel bus interface. Also the identification number of a device.

Bus Conflict – Conflict that occurs when two or more device outputs of opposite logic states are placed on a three-state bus at the same time.

Bus Controller – Generates bus commands and control signals.

Bus Driver – An IC that is added to a bus to provide sufficient drive between the CPU and the other devices that are tied to the bus. These are necessary because of capacitive loading, which slows down the data rate and prevents proper time sequencing of microprocessor operation and/or to overcome resistive loading when fan out requirements increase.

Bus Keyer – A keyer that does a key on top of the bus video before the signal gets to the M/E. On the 4100, these are packaged as "dual bus keyers" and are the modules between the bus rows and the M/Es. On the AVC, bus keyers are integral with the M/E module, with controls in a similar location.

Bus Row – Any row of video source select buttons allowing immediate selection of switcher video sources.

Bus Termination – Method of preventing reflections at the end of a bus. Necessary only in high-speed systems.

Business Television – One-way television broadcasts (usually by satellite) by corporations to multiple sites. The return path for interactivity is typically audio only.

Buss – In video switching equipment, a wire carrying line level signals (anything greater than mike level).

Button – a) On a mouse, a button is a switch that you press with a finger. **b)** In a window on your screen, a button is a labeled rectangle that you click using the cursor and mouse. **c)** This is a rectangular area in the Subpicture display area highlighted by the Highlight Information (HLI) that is used to define the active area on a menu associated with a specific action.

Button Menu – These are consecutive numbers assigned to each button on a menu, ranging from "1" to "36".

BVB (Black-Video-Black) – A preview mode that displays black, newly inserted video, and then black again.

B-vop (Bidirectionally Predictive-Coded Video Object Plane) – A vop that is coded using motion compensated prediction from past and/or future reference vops.

BW – See Bandwidth.

BWF (Broadcast WAV Format) – Broadcast WAV Format is an audio file format based on Microsoft's WAV Format that carries PCM or MPEG encoded audio. BWF adds the metadata, such as a description, originator, date and coding history, needed for interchange between broadcasters.

B-Y – One of the color difference signals used in the NTSC system, obtained by subtracting luminance from the blue camera signal. This is the signal that drives the horizontal axis of a vectorscope. The human visual system has much less acuity for spatial variation of color than for brightness. Rather than conveying RGB, it is advantageous to convey luma in one channel, and color information that has had luma removed in the two other channels. In an analog system, the two color channels can have less bandwidth, typically one-third that of luma. In a digital system each of the two color channels can have considerably less data rate (or data capacity) than luma. Green dominates the luma channel: about 59% of the luma signal comprises green information. Therefore it is sensible, and advantageous for signal-to-noise reasons, to base the two color channels on blue and red. The simplest way to remove luma from each of these is to subtract it to form the difference between a primary color and luma.

Hence, the basic video color-difference pair is (B-Y), (R-Y) [pronounced “B minus Y, R minus Y”]. The (B-Y) signal reaches its extreme values at blue (R=0, G=0, B=1; Y=0.114; B-Y=+0.886) and at yellow (R=1, G=1, B=0; Y=0.886; B-Y=-0.886). Similarly, the extreme of (R-Y), +-0.701, occur at red and cyan. These are inconvenient values for both digital and analog systems. The color spaces YPbPr, YCbCr, Photo YCC and YUV are simply scaled versions of (Y, B-Y, R-Y) that place the extreme of the color difference channels at more convenient values.

Byte – a) A complete set of quantized levels containing all of the bits. Bytes consisting of 8 to 10 bits per sample are typical. **b)** Group of eight bits. Can be used to represent a character. Microcomputer instructions require one, two, or three bytes. A word can be one or more bytes. **c)** A group of adjacent binary digits operated upon as a unit, capable of holding one character in the local character set, and usually shorter than a computer word (frequently connotes a group of eight bits). Current usage within the context of electronic production concerns is tending to define a byte as eight bits to have a consistent data unit for measuring memory capacities, etc. **d)** 8 bits. The combination of 8 bits into 1 byte allows each byte to represent 256 possible values. See Megabyte, Gigabyte, Terabyte.

1 byte = 8 bits = 256 discrete values (brightness, color, etc.)
1 kilobyte = 1,024 bytes (not 1000 bytes)
1 megabyte = 1,048,576 bytes (not one million bytes)
1 gigabyte = 1, 073,741,824 bytes (not one billion bytes)
1 terabyte = 1,099,511,627,776 bytes (not one trillion bytes)

Byte Aligned – a) A bit in a coded bit stream is byte-aligned if its position is a multiple of 8-bits from the first bit in the stream. **b)** Data in a coded bit stream that is positioned a multiple of 8-bits from the first bit in the stream. For example, MPEG video and system streams are byte-aligned.

▶ C

C/N – Ratio of RF or IF signal power to noise power.

CA (Conditional Access) – Information describing, or indicating whether the program is scrambled.

Cable Equalization – The process of altering the frequency response of a video amplifier to compensate for high-frequency losses in coaxial cable.

Cable Network – Group of radio or television outlets linked by cable or microwave that transmit identical programs simultaneously, or the company that produces programs for them. Cable networks include companies such as: The Discovery Channel, ESPN, C-SPAN. National broadcast commercial television networks in the U.S. include ABC, NBC, CBS.

Cable Television – System that transmits original programming and programming of broadcast television stations, to consumers over a wired network.

Cable Virtual Channel Table (CVCT) – An ATSC table that identifies a set of one or more channels within a cable network. The table includes major and minor channel numbers, carrier frequency, short channel name, and information for navigation and tuning.

Cablecasting – To originate programming over a cable system. Includes public access programming.

CAD (Computer-Aided Design) – This usually refers to a design of system that uses computer specialized software.

Calibrate – To fine-tune video levels for maximum clarity during digitizing (from videotape).

Calibrated Delay Fixture – This fixture is another way of measuring Chrominance to Luminance delay. The fixture allows the delay to be incrementally adjusted until there is only one peak in the baseline indicating all the delay errors have been dialed out. The delay value can be read from the fixture while the gain can be calculated from the remaining peaks.

Call – Jump to a subroutine. A jump to a specified address is performed, but the contents of the program counter are saved (usually in the stack) so that the calling program flow can resume when the subroutine is finished.

Camcorder – The combination of camera and video tape recorder in one device. Camcorders permit easy and rapid photography and recording simultaneously. Camcorders are available in most home video formats: 8 mm, Hi-8, VHS, VHS-C, S-VHS, etc.

Camera Analysis – The measurement and evaluation of the spectral sensitivities of the three color channels of a television camera. The camera and matrixing are identified and measured.

Camera Analysis, Ideal – For optimum image quality, both objective and perceived, the spectral sensitivities of the three color channels of a television camera should be matched to the primary colors of the R, G, B color space. Note: Some practice still exists matching the color channels of the camera to the display phosphors. This reduces the color gamut and carries unnecessary noise penalties. The practice is deprecated.

Camera Chain – Television camera and associated equipment, consisting of power supply and sync generator.

Camera Control Unit (CCU) – Remote control device for video cameras usually placed in the editing suite. Controls usually include video levels, color balancing and iris control.

Camera Log – A record sheet giving details of the scene photographed on a roll of original negative.

Camera Match – Shot-to-shot picture fidelity. Improperly matched cameras may exhibit differences in level, balance, colorimetry, or defects that will cause the picture quality to change from shot to shot. These differences may present problems during editing, as the editor attempts to minimize differences.

Camera Supply – Most video cameras use an external DC voltage supply which is derived either from a battery belt worn by the camera operator, from a battery within the video recorder itself, or from the mains power supply (after voltage conversion).

Camera Tube – See Pickup Tube.

Candela (cd) – A unit for measuring luminous intensity. One candela is approximately equal to the amount of light energy generated by an ordinary candle. Since 1948 a more precise definition of a candela has become: “the luminous intensity of a black body heated up to a temperature at which platinum converges from a liquid state to a solid”.

Candlepower – The unit measure of incident light.

Canned – In the can, old movie term still used occasionally to mean finished.

Capstan – The driven spindle or shaft in a tape recorder, sometimes the motor shaft itself, which rotates against the tape (which is backed up by a rubber pressure or pinchroller), pulling it through the machine at constant speed during recording and playback modes of operation.

Capstan Crease – Wrinkles or creases pressed into the tape by the capstan//pinchroller assembly.

Capstan Idler – A rubber wheel which presses the magnetic tape against the capstan so that the capstan can move the tape.

Capstan Servo – The regulating device of the capstan as it passes tape through a videotape recorder.

Caption – See Title.

Capture – The process of digitizing the analog video signal. See Digitize.

Capture Card – Sometimes called a capture or video board, the logic card installed into a computer and used to digitize video. 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 Mask Effect – An effect that converts the format of source data during playback. For example, it could convert video frame data between PAL (25 FPS) and NTSC (29.97 fps) formats.

Card Guides – Narrow metal or plastic tracks at the top and bottom of the chassis into which you slide printed circuit boards.

Cardioid – The quasi-heart-shaped sensitivity pattern of most unidirectional microphones. Hypercardioid and supercardioid microphones have basically similar patterns, but with longer, narrower areas of sensitivity at the front, and slightly increased rear sensitivity.

Carriage – A cable system's procedure of carrying the signals of television stations on its various channels. FCC rules determine which signals cable systems must or may carry.

Carrier – A signal which is modulated with data to be transmitted.

Carry Flag – Flag bit in the microprocessor's status register, which is used to indicate the overflow of an operation by the arithmetic logic unit.

Cartridge – A plastic container that holds tape for easy loading into a matching recorder or player.

CAS – See Conditional Access System.

Cassette – A tape cartridge in which the tape passes from one hub to another.

Casting – The ability to distribute live video (or audio) broadcasts over local or wide area networks that may optionally be received by many viewers.

CAT (Conditional Access Table) – Provides information on the conditional access systems used, packets having PID codes of 1 and information about the scrambling system. See ECM and EMM.

Cathode-Ray Tube (CRT) – a) An electron tube assembly containing an electron gun arranged to direct a beam upon a fluorescent screen. Scanning by the beam can produce light at all points in the scanned raster. **b)** Display device, or picture tube, for video information.

CATV (Community Access Television) – Acronym for cable TV, derived from the older term, community antenna television. Also can stand for Community Access Television.

CATV Penetration – The ratio of the number of subscribers to the total number of households passed by the cable system.

CAV (Component Analog Video) – Analog video signal format in which the picture information is conveyed in three signals. CAV formats include: RGB; Y, R-Y, B-Y; Y, I, Q; Y, U, V; Y, Pb, Pr. Refer to the definition for Analog Components.

CB – Scaled version of the B-Y signal.

C-Band – The group of microwave frequencies from 4 to 6 GHz. C-band satellites use a band of satellite downlink frequencies between 3.7 and 4.2 GHz. C-band is also used by terrestrial, line-of-sight microwave links.

CBC – See Canadian Broadcasting Corporation.

CBPS (Coded Bits Per Symbol)

CBR – See Constant Bit Rate.

CC – See Closed Captioning.

CCD – See Charge Coupled Device.

CCD Aperture – The proportion of the total area of a CCD chip that is photosensitive.

CCETT (Centre Commun d'Etudes de Telecommunications et de Telediffusion, France) – The CCETT is one of the three licensors of the MPEG Layer II coding algorithm. The audio coding technique, originally developed for DAB under EUREKA 147 jointly with IRT and Philips, was selected by ISO/MPEG as Layer II of the MPEG-1 standard.

CCI (Copy Control Information) – Information specifying if content is allowed to be copied.

CCIR (Comite Consultatif Internationale des Radiocommunications) – International Radio Consultative Committee, an international standards committee that has been absorbed by the parent body, the ITU. A permanent organization within the ITU with the duty to study technical and operating questions relating specifically to radio communications and to make recommendations on them. The CCIR does not prepare regulations; it draws up recommendations and reports, produced by experts from both public and private entities, which provide guidance on the best operational methods and techniques. The CCIR is expected to base its recommendations upon 150 and IEC international standards, but when no relevant one exists, the CCIR has been known to initiate standardization. These recommendations and reports provide a basis for international standardization of telecommunications.

CCIR-468 – Specifies the standard for weighted and unweighted noise measurements. The weighted standard specifies the weighting filter and quasi-peak detector. The unweighted standard specifies a 22 Hz to 22 kHz bandwidth limiting filter and RMS detector.

CCIR-500 – Method for the Subjective Assessment of the Quality of Television Pictures. CCIR-500 is a detailed review of the recommendations for conducting subjective analysis of image quality. The problems of defining perceived image quality are reviewed, and the evaluation procedures for interval scaling, ordinal scaling, and ratio scaling are described – along with the applications for which each is best employed.

CCIR-601 – See ITU-R BT.601.

CCIR-656 – The physical parallel and serial interconnect scheme for ITU-R BT.601-2-601. CCIR 656 defines the parallel connector pinouts as well as the blanking, sync, and multiplexing schemes used in both parallel and serial interfaces. Reflects definitions in EBU Tech 3267 (for 625 line signals) and in SMPTE 125M (parallel 525) and SMPTE 259M (serial 525).

CCIR-6601 – Consultative Committee International Radio. A standard that corresponds to the 4:2:2 format.

CCIR-709 – The recommendation considers that the HDTV studio standard must be harmonized with those of current and developing television systems and with those of existing motion-picture film. In a review of current systems, a consensus was identified in specifications for opto/electronic conversion, picture characteristics, picture scanning characteristics, and signal format (both analog and digital representations). Work is underway in the editing of national and CCIR related documents to determine whether these consensus values may be affirmed in the next review of the individual documents. The values in Rec 709 are considered interim, and CCIR notes that continuing work is expected to define target parameters for future improved image rendition.

CCIR-801 – At present, the first results on studies related to Study Programme 18U/11 have been collected. It must be recognized that these studies must be intensified in close cooperation with such organizations as the IEC and ISO to take fully into account the requirements for implementation of HDTV for media other than broadcasting, i.e., cinema, printing, medical applications, scientific work, and video conferencing. In addition, the transmission of HDTV signals via new digital transmission channels or networks has to be considered and taken into account.

CCITT (Comite Consultatif Internationale Telegraphique et Telephonique) – A committee of the International Telecommunications Union responsible for making technical recommendations about telephone and data communication systems for PTTs and suppliers. Plenary sessions are held every four years to adopt new standards. Now part of ITU-TSS.

CCITT 0.33 – Recommendation 0.33 of the CCITT Specification for Measuring Equipment, Volume IV, Series 0 Recommendations-1988. This defines the automatic test sequences that are used to check on the different parameters that are important to signal quality. Recommendation 0.33 has defined sequences for both monaural and stereo audio testing. Also called EBU Recommendation R27.

CCK – See Composite Chroma Key.

CCTV – See Closed Circuit TV.

CCTV Camera – A unit containing an imaging device that produces a video signal in the basic bandwidth.

CCTV Installation – A CCTV system, or an associated group of systems, together with all necessary hardware, auxiliary lighting, etc., located at the protected site.

CCTV System – An arrangement comprised of a camera and lens with all ancillary equipment required for the surveillance of a specific protected area.

CCU – See Camera Control Unit.

CCVE (Closed Circuit Video Equipment) – An alternative acronym for CCTV.

CD (Committee Draft) – This is the first public form of a proposed international standard.

CD (Compact Disc) – a) A 4.75" disc used to store optical, machine-readable, digital data that can be accessed with a laser-based reader such as a CD player. **b)** A standard medium for storing digital data in machine-readable form, accessible with a laser-based reader. Readers are typically referred to as CD-ROM drives.

CD+G (Compact Disc Plus Graphics) – A variation of CD which embeds graphical data in with the audio data, allowing video pictures to be displayed periodically as music is played. Primarily used for karaoke.

CD-DA (Compact Disc-Digital Audio) – Standard music CDs. CD-DA became CD-ROMs when people realized that you could store 650 Mb of computer data on a 12cm optical disc. CD-ROM drives are simply another kind of digital storage media for computers, albeit read-only. They are peripherals just like hard disks and floppy drives. (Incidentally, the convention is that when referring to magnetic media, it is spelled disk. Optical media like CDs, laserdisc, and all the other formats are spelled disc.)

CDDI (Copper Data Distributed Interface) – A high speed data interface, like FDDI but using copper. See FDDI.

CD-I – See Compact Disc Interactive.

CD-ROM – See Compact Disc Read Only Memory.

CDS (Correlated Double Sampling) – A technique used in the design of some CCD cameras that reduces the video signal noise generated by the chip.

CDT (Carrier Definition Table)

CDTV – See Conventional Definition Television.

CD-XA – CD-XA is a CD-ROM extension being designed to support digital audio and still images. Announced in August 1988 by Microsoft, Philips, and Sony, the CD-ROM XA (for Extended Architecture) format incorporates audio from the CD-I format. It is consistent with ISO 9660, (the volume and the structure of CD-ROM), is an application extension. CD-XA defines another way of formatting sectors on a CD-ROM, including headers in the sectors that describe the type (audio, video, data) and some additional info (markers, resolution in case of a video or audio sector, file numbers, etc.). The data written on a CD-XA can still be in ISO9660 file system format and therefore be readable by MSCDEX and UNIX CD-ROM file system translators. A CD-I player can also read CD-XA discs even if its file system only resembles ISO9660 and isn't fully compatible. However, when a disc is inserted in a CD-I player, the player tries to load an executable application from the CD-XA, normally some 68000 application in the /CDI directory. Its name is stored in the disc's primary volume descriptor. CD-XA bridge discs, like Kodak's Photo CDs, do have such an application, ordinary CD-XA discs don't. A CD-DA drive is a CD-ROM drive but with some of the compressed audio capabilities found in a CD-I player (called ADPCM). This allows interleaving of audio and other data so that an XA drive can play audio and display pictures (or other things) simultaneously. There is special hardware in an XA drive controller to handle the audio playback. This format came from a desire to inject some of the features of CD-I back into the professional market.

CED (Capacitance Electronic Disk) – Technology used by RCA in their Videodisk product.

Cel – Refers to a transparent sheet of glass or acetate on which a "layer" or "level" of artwork is painted. Since the sheet is clear where there is no artwork, several sheets can be superimposed, allowing "automatic hidden-surface removal", or simply, the "painter's algorithm".

Celanar – Trade name for polyester produced by Celanese.

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

Cell Animation – 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. One of the two main types of animation associated with digital video. Compare with Frame-Based 2D Animation.

Cell Command – A navigation command executed when the presentation of a cell has been completed.

Cell Compression – Cell is a compression technique developed by Sun Microsystems. The compression algorithms, the bit stream definition, and the decompression algorithms are open; that is, Sun will tell anybody who is interested about them. Cell compression is similar to MPEG and H.261 in that there is a lot of room for value-add on the compressor end. Getting the highest quality image from a given bit count at a reasonable amount of computation is an art. In addition the bit-stream completely defines the compression format and defines what the decoder must do and there is less art in the decoder. There are two flavors of Cell: the original called Cell or CellA, and a newer flavor called CellB.

Cell Loss Priority (CLP) – A flag in the ATM cell header which indicates the priority (normal or low) of the payload.

Cell Loss Ratio (CLR) – A QoS specification in an ATM network. It measures the number of cells that can be lost to the network relative to the total number of cells transmitted.

Cell Side – The base (celluloid) surface of a strip of film.

CellB – A video coding scheme based on quadtree decomposition of each image.

CELP – See Code-Excited Linear Prediction.

CEN (Comite Europeen de Normalisation) – European committee for standardization.

CENELEC (Comite Europeen de Normalisation Electrotechnique) – European committee for electrotechnical standardization.

Center Channel – The central component of a front stereo audio presentation channel.

Central Processing Unit – Computer module in charge of fetching, decoding, and executing instructions. It incorporates a control unit, an ALU, and related facilities (registers, clocks, drivers).

Centralized Network – A network where a central server controls services and information; the server is maintained by one or more individuals called network administrators. On a centralized network that uses NIS, this server is called the NIS master, and all other systems on the network are called NIS clients. See also Network Administrator, NIS, NIS Client, NIS Domain, and NIS Master.

Ceramic Microphone – See Piezoelectric Microphone.

Certified Tape – Tape that is electrically tested on a specified number of tracks and is certified by the supplier to have less than a certain total number of permanent errors.

Certifier – Equipment that evaluates the ability of magnetic tape to record and reproduce. The equipment normally counts and charts each error on the tape, including level and duration of dropouts. In the Certify Mode, it stops on error to allow for visually inspecting the tape to see if the error cause is correctable or permanent.

CES – Consumer Electronics Show – A semi-annual event sponsored by the Consumer Electronics Group of EIA, at which IDTV and HDTV schemes have been demonstrated.

CFA (Color Filter Array) – A set of optical pixel filters used in single-chip color CCD cameras to produce the color components of a video signal.

CG – See Character Generator.

CGA (Color Graphics Adapter) – A low-resolution video display standard, invented for the first IBM PC. CGA pixel resolution is 320 x 200.

CGI – Abbreviation for Computer Graphic Imagery.

CGM (Computer Graphics Metafile) – A standard format that allows for the interchanging of graphics images.

CGMS (Copy Guard Management System) – For NTSC systems, a method of preventing copies or controlling the number of sequential copies allowed. CGMS is transmitted on line 20 for odd fields and line 283 for even fields for NTSC. For digital formats it is added to the digital signal conforming to IEEE 1394.

CGMS-A (Copy Generation Management System – Analog) – See EIA-608.

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.

Change List – A list of instructions produced by the film composer that is used to track and compare the differences between two versions of a digital sequence. A change list is used to update a work print cutting with specified new edits and revisions.

Change-Over – a) In projection, the act of changing from one projector to another, preferably without interrupting the continuity of projection. **b)** The points in the picture at which such a change is made.

Changing Pixel – In shape coding, first pixel with color change from the previous pixel (opaque to transparent or vice versa).

Channel – a) An independent signal path. Stereo recorders have two such channels. Quadraphonic ones have four. **b)** A digital medium that stores or transports a digital television stream. **c)** A term mainly used to describe the configuration of audio tracks. For Dolby Digital there are 6 channels (left, center, right, left rear, right rear and low frequency effects). For linear PCM and MPEG audio, there are 8 channels. All DVD players are required to have a two-channel downmix output, which is a stereo version produced from the intrinsic channels on the disc if there are more than two channels on the disc.

Channel Bit – The bits stored on the disc, after being modulated.

Channel Capacity – The maximum number of 6 MHz channels which can be simultaneously carried on a CATV system.

Channel Code – A modulation technique that converts raw data into a signal that can be recorded or transmitted by radio or cable.

Channel Coding – a) Describes the way in which the 1s and 0s of the data stream are represented on the transmission path. **b)** Refers to any processing to use a particular communication channel or medium. Examples are forward error correction coding and prioritization of different parts of the coded video bit stream.

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

Channel Editor – The tool used to set keyframes and modify animation curves of the channels.

Channel Hierarchy – A set of animation parameters arranged and displayed in a logical group. A group, or upper-level, channel is called a folder. For example, the camera folder contains channels for camera settings such as position, interest and focal length.

Channel Stuffing – Techniques for adding information to an NTSC channel without increasing its bandwidth or eliminating its receiver-compatibility.

Channel-Compatible – An ATV transmission scheme that will fit within the confines of a standard, 6 MHz NTSC transmission channel. A higher level of channel-compatibility demands NTSC-like AM-VSB transmission so that the ATV channel will not cause any interference to other channels that would not otherwise be caused by an NTSC channel. Channel-compatible ATV schemes need not necessarily also be receiver-compatible.

Chaoji VideoCD – Another name for Super VideoCD.

CHAP (Challenge Handshake Authentication Protocol) – Network logon authentication. Three-way handshaking occurs. A link is established. The server agent sends a message to the machine originating the link. This machine then computes a hash function from the challenge and sends it to the server. The server determines if this is the expected response and, if so, authenticates the connection. The authentication procedure can take place once or multiple times during a session and each time it takes place the challenge can change.

Chapter – A chapter in a video disc is a section divider. Chapters are subsets of the video disc. In the DVD format, a chapter is a division of a title.

Chapter Stop – Programming that allows a viewer to jump immediately to a particular part of a title. A book with chapters is the common metaphor for a DVD.

Character Generator (CG) – a) A computer used to electronically generate text and sometimes graphics for video titles or captions which can be superimposed over a video signal. Text is usually entered via a keyboard, allowing selection of various fonts, sizes, colors, styles and background colors, then stored as multiple pages for retrieval. **b)** An electronic device that generates video letters for use as captions in television productions. The output of the character generator is often used as an external key input to the switcher. **c)** Circuit that forms the letters or numbers on a display or printer.

Characteristic – An aspect or parameter of a particular television system that is different from another system's, but not necessarily a defect. Characteristics include aspect ratio, colorimetry, resolution, and sound bandwidth.

Charge Coupled Device (CCD) – a) A semiconductor device that converts optical images to electronic signals. CCDs are the most commonly found type of image sensor in consumer camcorders and video cameras. **b)** Serial storage technology that uses MOS capacitors. **c)** A solid-state image sensor that converts light energy to electricity.

Chassis – The housing for removable disk modules. The chassis contains a power supply, drives and connectors for each module.

C-HDTV (Cable HDTV) – A seemingly impossible concept calling for channel-compatible ATV transmission of 850 lines of both static and dynamic horizontal and vertical resolution, among other characteristics. Its feasibility is being studied at ATRP.

Check Box – Used to select from a list of related items. An "x" marks the selected options in the corresponding box. (Select as many items as desired – one, none, or all.)

Checkerboard – Automatic assembly process where all edits from mounted reels are made, and edits for unmounted reels are skipped. Example: Reels 5, 29 and 44 are mounted on VTRs. The editing system looks at the list and assembles all edits that have reel numbers 5, 29 and 44 assigned to them, inserting these events at the exact spot on the master tape where they belong.

Checkerboard Cutting – A method of assembling alternate scenes of negative in A and B rolls allowing prints to be made without visible splices.

Checksum – a) 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. **b)** Method used to verify the integrity of data loaded into the computer. **c)** A simple check value of a block of data, calculated by adding all the bytes in a block. It is easily fooled by typical errors in data transmission systems; so that for most applications, a more sophisticated system such as CRC is preferred.

Chip – a) Common name for all ICs. **b)** An integrated circuit in which all the components are micro-fabricated on a tiny piece of silicon or similar material.

Chip Chart – A black and white test chart. It contains "chips" in varying intensities, that make up a gray scale. It is used to check the gray scale taking characteristics of a camera, including the parameter of gamma.

Chip Enable (CE) – See Chip Select.

Chip Select (CS) – Usually enables three-state drivers on the chip's output lines. Most LSI chips have one or more chip selects. The CS line is used to select one chip among many.

Choose – Choose means make a choice to select an action that will take place, i.e., press the left mouse button to bring up a pop-up menu, move the cursor to highlight the command that you want to run, then release the button.

Chroma – a) The depth or saturation of color. The saturation control adjusts the amplitude of color of the switcher's matte and background outputs. **b)** The (M) NTSC or (B, D, G, H, I) PAL video signal contains two pieces that make up what you see on the screen: the black and white (luma) part, and the color part. Chroma is the color part. Chroma can be further broken down into two properties of color: hue and saturation. Chroma can also be describe as a matrix, block or single pel representing one of the two color difference signals related to the primary colors in the manner defined in the bit stream. The symbols used for the color difference signals are Cr and Cb.

Chroma Bandpass – In an (M) NTSC or (B, D, G, H, I) PAL video signal, the luma (black and white) and the chroma (color) information are combined together. To decode an NTSC or PAL video signal, the luma and chroma must be separated. The chroma bandpass filter removes the luma from the video signal, leaving the chroma relatively intact. This works fairly well except in certain images where the luma information and chroma information overlap, meaning chroma and luminance information occupy the same frequency space. Depending on the filtering technique used, it can be difficult for the filter to separate the chroma from the luminance information. This results in some luminance information being interpreted as chroma and some chroma information being interpreted as luminance. The effects of this improper separation of luminance and chroma are especially noticeable when the television scene contains objects with thin, closely spaced black and white lines. As the camera moves across this object, there will be a rainbow of colors appear in the object indicating the improper separation of the luminance and chroma information.

Chroma Burst – See Color Burst.

Chroma Comp – This is a deliberate distortion of colors usually used to achieve unusual matching. By detecting the quadrant the color is in (By normally deciding whether R-Y and B-Y are positive or negative), the amplitude of R-Y, B-Y just for colors in that quadrant can be changed; hence, the hue and saturation can be changed for those colors without affecting others.

Chroma Corrector – A device used to correct problems related to the chroma of the video signal, as well as color balance and color noise.

Chroma Crawl – An NTSC artifact also sometimes referred to as moving dots, a crawling of the edges of saturated colors in an NTSC picture. Chroma Crawl is a form of cross-luminance, a result of a television set decoding color information as high-detail luminance information (dots). Most ATV schemes seek to eliminate or reduce chroma crawl, possibly because it is so immediately apparent.

Chroma Demodulation – The process of removing the color video information from a composite video signal where chrominance information is modulated on a color subcarrier. The phase reference of the subcarrier, is color burst which is a phase coherent sample of the color subcarrier.

Chroma Demodulator – Refer to the NTSC Composite Receiver Model at the end of this glossary when studying this definition. After the (M) NTSC or (B, D, G, H, I) PAL video signal makes its way through the Y/C separator, by either the chroma bandpass, chroma trap, or comb filter method, the colors are then decoded by the chroma demodulator. Using the recovered color subcarrier, the chroma demodulators take the chroma output of the Y/C separator and recovers two color difference signals (typically I and Q or U and V).

Chroma Flutter – A rapid coherent variation in the chroma saturation.

Chroma Format – Defines the number of chrominance blocks in a macroblock.

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

Chroma Key (CK) – a) A method of combining two video images. The most common example of chroma keying is the news weather person standing in front of a weather map. The details of the process are, a camera is pointed at the weather person who is standing in front of a bright blue or green background. The weather person and bright-blue or green background image is fed along with the image of the weather map into a computing device. Wherever the computing device sees the bright-blue or green background, it displays the weather map. Wherever the computing device does not see bright blue or green, it shows the weather person. **b)** A process for controlling the overlay of one video image over another, the areas of overlay being defined by a specific color or chrominance in one of the images. More versatility is available when working in the digital mode than in the analog since the color to define the effective mask can be more precisely specified. Effective use of chroma key frequently required high definition in the color image and, therefore, full bandwidth R, G, B is preferred. Linear key provides an alternate method for control of the overlay. **c)** Chroma keying is the process of controlling the overlay of one video image over another. The overlay is defined by a specific color or chrominance in one of the images.

Chroma Noise – a) Noise that manifests itself in a video picture as colored snow. **b)** Colors appear to be moving on screen. In color areas of picture, usually most noticeable in highly saturated reds.

Chroma Nulling – A process of generating a matte color 180 degrees out of phase with a background color and summing them hence removing all color.

Chroma Resolution – The amount of color detail available in a television system, separate from any brightness detail. In almost all television schemes, chroma resolution is lower than luminance resolution, matching visual acuity. Horizontal chroma resolution is only about 12 percent of luminance resolution in NTSC; in advanced schemes it is usually 50 percent. See also Resolution.

Chroma Simulcast – A type of scalability (which is a subset of SNR scalability) where the Enhancement Layer(s) contain only coded refinement data for the DC coefficients and all the data for the AC coefficients of the chroma components.

Chroma Trap – In an (M) NTSC or (B, D, G, H, I) PAL video signal, the luma (black and white) and the chroma (color) information are combined together. To decode the video signal, the luma and chroma must be separated. The chroma trap is a method of doing this.

Chrominance – a) The data that represents one of the two color-difference signals Cr and Cb. **b)** The color portion of a video signal that is a mixture of hue and saturation, but not of luminance (brightness). Every color signal has both chrominance and luminance. **c)** Chrominance refers to the color information in a television picture. Chrominance can be further broken down into two properties of color: hue and saturation. See Chroma.

Chrominance Component – A matrix, block or single sample representing one of the two color difference signals related to the primary colors in the manner defined in the bitstream. The symbols used for the chrominance signals are Cr and Cb.

Chrominance Format – Defines the number of chrominance blocks in a macroblock.

Chrominance Frequency Response – Describes the frequency response of the chrominance channel.

Chrominance Luminance Delay Inequality – Appears as the change in relative timing of the chrominance component relative to the luminance component of the test signal when a test signal having defined chrominance and luminance components is applied to the sending end of a television facility.

Chrominance Luminance Gain Inequality – Appears as the change in amplitude of the color component relative to the luminance component (of the test signal) when a test signal having defined chrominance and luminance components is applied to the sending end of a television facility.

Chrominance Nonlinear Gain – Present if chrominance gain is affected by chrominance amplitude. Chrominance nonlinear gain distortion is expressed in IRE or percent. It should be measured at different APL levels and typically the worst error is quoted. Picture effects include incorrect color saturation due to nonlinear gain in relatively high amplitude chrominance signals. The modulated pedestal test signal is used to test for this distortion.

Chrominance Nonlinear Phase – This distortion is present if a signal's chrominance phase is affected by chrominance amplitude. These phase errors are a result of the system's inability to uniformly process all amplitudes of high-frequency chrominance information. Chrominance nonlinear phase distortion is expressed in degrees of shift of subcarrier phase. This parameter should be measured at different APL (Average Picture Level); the worst result is quoted as the amount of distortion. Chrominance nonlinear phase distortion will cause picture hue to shift as color saturation increases. A modulated pedestal signal is used to measure this distortion. The modulated pedestal signal consists of three chrominance packets with the same phase and luminance level but each chrominance packet has increasing amplitudes of 20, 40 and 80 IRE.

Chrominance Signal – The high-frequency portion of the video signal which is obtained by quadrature amplitude modulation (QAM) of a 4.43 MHz (PAL) or 3.579545 MHz (NTSC) subcarrier with R-Y and B-Y information.

Chrominance Subsampling – Reduction of the amount of color information by either rejecting chrominance samples or by averaging adjacent chrominance samples.

Chrominance to Burst Phase – The difference between the expected phase and the actual phase of the chrominance portion of the video signal relative to burst phase.

Chrominance to Luminance Delay Distortion – The difference between the time it takes for the chrominance portion of the signal to pass through a system and the time it takes for the luminance portion to pass through. The amount of distortion is typically expressed in nanoseconds. The number is positive for delayed chrominance and negative for advanced chrominance. This distortion manifests itself in the picture as smearing or bleeding of the color particularly at the edges of objects in the picture. It may also cause poor reproduction of sharp luminance transitions. Any signal containing a 12.5T sine-squared pulse with 3.579545 MHz modulation can be used to measure chrominance-to-luminance delay distortions. Many combination signals such as FCC Composite and NTC-7 Composite contain this pulse.

Chrominance to Luminance Gain Distortion – This is the difference between the gain of the chrominance components and the gain of the luminance components as they pass through the system. The amount of distortion can be expressed in IRE, percent or dB. The number given is negative for low chrominance and positive for high chrominance. This distortion most commonly appears as attenuation or peaking of the chrominance information that shows up in the picture as incorrect color saturation. Any signal containing a 12.5T sine-squared pulse with 3.579545 MHz modulation can be used to measure chrominance-to-luminance gain distortions. Many combination signals such as FCC Composite and NTC-7 Composite contain this pulse.

Chrominance to Luminance Intermodulation – This distortion is also known as crosstalk or cross-modulation. Splice is present when luminance amplitude is affect by the superimposed chrominance. The luminance change may be caused by clipping of high-amplitude chrominance peaks, quadrature distortion or crosstalk. The modulated pedestal is used to test for this distortion. Distortions can be expressed as: IRE with the pedestal level normalized to 50 IRE, as a percentage of the pedestal level, as a percentage of the measured white bar amplitude, as a percentage of 714 mV. These definitions will yield different results under some conditions so it is very important to standardize on a single method of making intermodulation measurements. Picture effects include unwarranted brightness variations due to color saturation changes affecting the luminance.

Chromium Dioxide (CrO_2) – A modern magnetic particle oxide of the high energy type used in magnetic recording tape. Chromium dioxide is a highly acicular particle with the crystal structure of rutile. Tapes made of CrO_2 exhibit a coercivity of 425 to 475 oersteds.

Chunking – The transfer of media files in segments so other workgroup users can access and use the media before complete files have been sent.

CI (Common Interface) – CI is used for satellite receivers. Manufacturers have agreed on use a common interface for satellite decoding cards. For CI these cards (called CAM) look like PCMCIA cards, as seen with laptops, which can hold one smart card. This smart card holds the keys to the subscribed service. The CAM holds the hardware and software required for decoding the data stream (after decoding this is video and audio).

CIE (Commission Internationale de l'Eclairage) – French acronym for the International Illumination Commission. An international standardization organization that created the chromaticity diagrams (color charts) used to define the colorimetry of all television systems. The CIE is concerned with methods of measurement plus recommended practices and standards concerning the properties and applications of light.

CIE 1931 Standard Colorimetric System (XYZ) – A system for determining the tristimulus values of any spectral power distribution using the set of reference color stimuli X, Y, Z, and the three CIE color matching functions x(lambda), y(lambda), z(lambda), adopted by the CIE in 1931.

CIELab Color Space – Three-dimensional, approximately uniform color space produced by plotting in rectangular coordinates L*, a*, b* quantities defined by the following equations. X, Y, Z describe the color stimulus considered, and Xn, Yn, Zn describe a specified white achromatic stimulus

(i.e., white reference). Equal distances in the color space represent approximately equal color differences.

$L^* = 116\ (Y/Yn)^{(1/3)} - 16 \qquad Y/Yn$

$a^* = 500[(X/Xn)^{(1/3)} - (Y/Yn)^{(1/3)}] \qquad X/Xn > 0.008\ 856$

$b^* = 200[(Y/Yn)^{(1/3)} - (Z/Zn)^{(1/3)}] \qquad Z/Zn$

CIELuv Color Space – Three-dimensional, approximately uniform color space produced by plotting in rectangular coordinated L*, u*, v* quantities defined by the following equations. Y, u_, v_ describe the color stimulus considered, and Yn, u_n, v_n describe a specified white achromatic stimulus (white reference). The coordinates of the associated chromaticity diagram are u_ and v_. L* is the approximate correlation of lightness, u* and v* are used to calculate an approximate correlate of chroma. Equal distances in the color space represent approximately equal color differences.

$L^* = 116\ (Y/Yn)^{(1/3)} - 16 \qquad Y/Yn > 0.008\ 856$

$u^* = 13\ L^*\ (u\_ - u\_n)$

$V^* = 13\ L^*\ (v\_ - v\_n)$

CIF – See Common Image Format, Common Interchange Format, Common Interface Format or Common Intermediate Format.

Cinch – Interlayer slippage of magnetic tape in roll form, resulting in buckling of some strands of tape. The tape will in many cases fold over itself causing permanent vertical creases in the tape. Also, if not fixed, it will cause increased dropouts. See Windowing.

Cinch Marks – Short scratches on the surface of a motion picture film, running parallel to its length; these are caused by improper winding of the roll, permitting one coil of film to slide against another.

Cinching – a) Longitudinal slippage between the layers of tape in a tape pack when the roll is accelerated or decelerated. **b)** The wrinkling, or folding over, of tape on itself in a loose tape pack. Normally occurs when a loose tape pack is stopped suddenly, causing outer tape layers to slip, which in turn causes a buckling of tape in the region of slip. The result is large dropouts or high error rates. **c)** Videotape damage due to creasing or folding.

CinemaScope – a) Trade name of a system of anamorphic widescreen presentation. **b)** The first modern widescreen movie format, achieving a 2.35:1 aspect ratio through the use of a 2:1 anamorphic squeeze.

Cinepak – Cinepak is a compression scheme dedicated to PC environments, based on a vector quantization algorithm. CinePak is a highly asymmetrical algorithm, i.e., the encoding takes much more processing power than the decoding process. The Cinepak algorithm is developed by Radius, and is licensed by a range of companies. Both Microsoft Windows 95 and Apple's QuickTime have built in Cinepak, for instance.

Cinex Strip – A short test print in which each frame has been printed at a different exposure level.

CIRC (Cross-Interleaved Reed Solomon Code) – An error-correction coding method which overlaps small frames of data.

Circle Take – A take from a film shot that has been marked for use or printing by a circled number on the camera report.

Circuit Switching – A dedicated path is formed for the duration of the communication through switching nodes between a number of locations.

CK – See Chroma Key.

Cladding – The outer part of a fiber optics cable, which is also a fiber but with a smaller material density than the center core. It enables a total reflection effect so that the light transmitted through the internal core stays inside.

Clamp – a) A device which functions during the horizontal blanking or sync interval to fix the level of the picture signal at some predetermined reference level at the beginning of each scanning line. **b)** Also known as a DC-restoration circuit or it can also refer to a switch used within the DC-restoration circuit. When used in the context of DC restoration, then it is usually used as "clamping". When used in its switch context, then it is referred to as just "clamp".

Clamper – A device which functions during the horizontal blanking or sync interval to fix the level of the picture signal at some predetermined reference level at the beginning of each scanning line.

Clamping – a) The process that establishes a fixed level for the picture signal at the beginning of each scanning line. **b)** The process whereby a video signal is references or "clamped" to a DC level to prevent pumping or bouncing under different picture levels. Without clamping, a dark picture would bounce if a white object appeared. Changes in APL would cause annoying pulsations in the video. Clamping is usually done at zero DC level on the breezeway of the back porch of horizontal sync. This is the most stable portion of a TV picture.

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

Class – In the object-oriented methodology, a class is a template for a set of objects with similar properties. Classes in general, and MPEG-4 classes in particular, are organized hierarchically. This hierarchy specifies how a class relates to others, in terms of inheritance, association or aggregation, and is called a Class Library.

Clean List (Clean EDL) – An edit decision list (EDL) used for linear editing that has no redundant or overlapping edits. Changes made during offline editing often result in edits that overlap or become redundant. Most computer-based editing systems can clean an EDL automatically. Contrast with Dirty List (Dirty EDL).

Clean Rooms – Rooms whose cleanliness is measured by the number of particles of a given size per cubic foot of room volume. For example, a class 100,000 clean room may have no more than 100,000 particles one-half micron or larger per cubic foot. Similarly, for class 10,000 and class 100 rooms. In addition, a class 10,000 room may have no more than 65 five-micron particles per cubic foot, while class 100,000 may have no more than 700.

Clear – Set a circuit to a known state, usually zero.

Clear Channel – AM radio station allowed to dominate its frequency with up to 50 kW of power; their signals are generally protected for distance of up to 750 miles at night.

Click – To hold the mouse still, then press and immediately release a mouse button.

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

Cliff Effect – An RF characteristic that causes DTV reception to change dramatically with a small change in power. At the fringes of reception, current analog TV pictures degrade by becoming "snowy". With DTV, relatively small changes in received power in weak signal areas will cause the DTV picture to change from perfect to nothing and hence the name, cliff effect.

Clip – a) A video file. **b)** In keying, the trigger point or range of a key source signal at which the key or insert takes place. **c)** 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. **d)** In digital picture manipulators, a manual 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. **e)** In desktop editing, a pointer to a piece of digitized video or audio that serves as source material for editing.

Clip (Insert Adjust) – To produce a key signal from a video signal, a clip insert control on the front panel is used to set a threshold level to which the video signal is compared. In luminance keying, any video (brightness) level above the clip level will insert the key; any level below the clip level will turn the key off. The clip level is adjusted to produce an optimum key free of noise and tearing. In the Key Invert mode, this clip relationship is reversed, allowing video below the clip level to be keyed in. This is used for keying from dark graphics on a light background.

Clip Level – The level that determines at what luminance a key will cut its hole. On AVC switchers, these are the insert and border adjust controls. On 4100 series, the corresponding controls are foreground and background. See Bi-Level Keyer.

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 clip bin.

Clipping – a) An electronic limit usually imposed in cameras to avoid overly bright or dark signals. When improperly applied can result in loss of picture information in very bright or very dark areas. Also used in switchers to set the cutoff point for mixing video signals. **b)** The electronic process of shearing off the peaks of either the white or black excursions of a video signal for limiting purposes. Sometimes, clipping is performed prior to modulation, and sometimes to limit the signal, so it will not exceed a predetermined level.

Clipping (Audio) – When recording audio, if an input signal is louder than can be properly reproduced by the hardware, the sound level will be cut off at its maximum. This process often causes distortion in the sound, so it is recommended that the input signal level be reduced in order to avoid this.

Clipping (Video) – With video signals, clipping refers to the process of recording a reduced image size by ignoring parts of the source image. Also referred to as cropping.

Clipping Logic – Circuitry used to prevent illegal color conversion. Some colors can be legal in one color space but not in another. To ensure a converted color is legal in one color format after being converted (transcoded) from another, the clipping logic clips the information until a legal color is represented.

Clock – Reference timing source in a system. A clock provides regular pulses that trigger or synchronize events.

Clock Doubling – Many processor chips double the frequency of the clock for central processing operations while maintaining the original frequency for other operations. This improves the computer's processing speed without requiring expensive peripheral chips like high-speed DRAM.

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

Clock Jitter – a) Timing uncertainty of the data cell edges in a digital signal. **b)** Undesirable random changes in clock phase.

Clock Phase Deviation – See Clock Skew.

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

Clock Reference – A special time stamp that conveys a reading of a time base.

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 Timecode – See Drop-Frame Timecode.

Close Miking – Placing a mike close to the sound source in order to pick up mainly direct sound and avoid picking up reverberant sound.

Closed Captioning – Service that provides decoded text information transmitted with the audio and video signal and displays it at the bottom of the display. See (M) NTSC EIA-608 specification. Transmitted on line 21 of NTSC/525 transmissions, contains subtitling information only. For HD see EIA708 specification. CC has no support for block graphics or multiple pages but it can support 8-colors and the use of an italic typeface. Frequently found on pre-recorded VHS cassettes and LDs, also used in broadcast. Also found on PAL/625 pre-recorded VHS cassettes in a modified version.

Closed Circuit – The method of transmission of programs or other material that limits its target audience to a specific group rather than the general public.

Closed Circuit TV (CCTV) – a) A video system used in many commercial installations for specific purposes such as security, medical and educational. **b)** A television system intended for only a limited number of viewers, as opposed to broadcast TV.

Closed GOP – A group of pictures in which the last pictures do not need data from the next GOP for bidirectional coding. Closed GOP is used to make a splice point in a bit stream.

Closed Subtitles – See Subtitles.

Closed-Loop – Circuit operating with feedback, whose inputs are a function of its outputs.

Closed-Loop Drive – A tape transport mechanism in which the tape's speed and tension are controlled by contact with a capstan at each end of the head assembly.

Closeup (CU) – A camera shot that is tightly framed, with its figure or subject filling the screen. Often qualified as medium closeup or extreme closeup. See also ECU.

CLUT – See Color Lookup Table.

CLV (Constant Linear Velocity) – Spiral format of audio compact disks and some video laser disks.

C-MAC – A MAC (Multiplexed Analog Component) with audio and data time multiplexed after modulation, specified for some European DBS. See also MAC.

C-Mode – A non-sequential method of assembly in which the edit decision list (EDL) is arranged by source tape number and ascending source time-code. See also A-More, B-Mode, D-Mode, E-Mode, Source Mode.

C-Mount – The first standard for CCTV lens screw mounting. It is defined with the thread of 1" (2.54 mm) in diameter and 32 threads/inch, and the back flange-to-CCD distance of 17.526 mm (0.69"). The C-mount description applies to both lenses and cameras. C-mount lenses can be put on both, C-mount and CS-mount cameras, only in the latter case an adaptor is required.

CMTT – French acronym for the Mixed Telephone and Television Committee, an international standardization committee concerned with such issues as B-ISDN.

CMYK – Refers to the colors that make up the subtractive color system used in pigment printers: cyan, magenta, yellow and black. In the CMYK subtractive color system these pigments or inks are applied to a white surface to filter that color light information from the white surface to create the final color. Black is used because cyan, magenta and yellow cannot be combined to create a true black.

CMYK Color Space – A subtractive color space with cyan, magenta, and yellow as primary color set with an optional addition of black (K). For such a color set subtractive color mixture applies. The CMYK values used represent the amount of colorant placed onto the background medium. They include the effects of dot gain.

CNG (Comfort Noise Generator) – During periods of transmit silence, when no packets are sent, the receiver has a choice of what to present to the listener. Muting the channel (playing absolutely nothing) gives the listener the unpleasant impression that the line has gone dead. A receiver-side CNG generates a local noise signal that it presents to the listener during silent periods. The match between the generated noise and the true background noise determines the quality of the CNG.

CNR – Carrier to Noise Ratio – Indicates how far the noise level is down on carrier level.

Coating – The magnetic layer of a magnetic tape, consisting of oxide particles held in a binder that is applied to the base film.

Coating Resistance – The electrical resistance of the coating measured between two parallel electrodes spaced a known distance apart along the length of tape.

Coating Thickness – The thickness of the magnetic coating applied to the base film of a mag tape. Modern tape coatings range in thickness from 170 to 650 microinches. Coating thickness is normally optimized for the intended application. In general, thin coatings give good resolution at the expense of reduced output at long wavelengths; thick coatings give a high output at long wavelengths at the expense of degraded resolution.

Coaxial Cable – a) A transmission line with a concentric pair of signal carrying conductors. There is an inner conductor and an outer conductor metallic sheath. The sheath aids in preventing external radiation from affecting the signal on the inner conductor and mini-mizes signal radiation from the transmission line. **b)** A large cable composed of fine foil wires that is used to carry high bandwidth signals such as cable TV or cable modem data streams. **c)** The most common type of cable used for copper transmission of video signals. It has a coaxial cross-section, where the center core is the signal conductor, while the outer shield protects it from external electromagnetic interference.

Cobalt Doped Oxide – A type of costing used on magnetic recording tape. This is normally a gamma ferric oxide particle which has been doped with cobalt to achieve a higher coercivity. Modern forms of this oxide are acicular and have been used to make tapes with coercivities in excess of 1000 oersteds.

Co-Channel Interference – Interference caused by two or more television broadcast stations utilizing the same transmission channel in different cities. It is a form of interference that affects only broadcast television.

Code – a) In computers, the machine language itself, or the process of converting from one language to another. **b)** A plan for representing each of a finite number of values or symbols as a particular arrangement or sequence of discrete conditions or events. To encode is to express given information by means of a code. **c)** A system of rules defining a one-to-one correspondence between information and its representation by characters, symbols, or signal elements.

CODEC (Coding/Decoding) – a) The algorithm used to capture analog video or audio onto your hard drive. **b)** Used to implement the physical combination of the coding and decoding circuits. **c)** A device for converting signals from analog to coded digital and then back again for use in digital transmission schemes. Most codecs employ proprietary coding algorithms for data compression. See Coder-Decoder.

Coded Audiovisual Object (Coded AV Object) – The representation of an AV object as it undergoes parsing and decompression that is optimized in terms of functionality. This representation consists of one stream object, or more in the case of scalable coding. In this case, the coded representation may consist of several stream objects associated to different scalability layers.

Coded Bitstream – A coded representation of a series of one or more pictures and/or audio signals.

Coded Data – Data elements represented in their encoded (compressed) form.

Coded Description – A description that has been encoded to fulfill relevant requirements such as compression efficiency, error resilience, random access, etc.

Coded Order – The order in which the pictures are stored and decoded. This order is not necessarily the same as the display order.

Coded Orthogonal Frequency Division Multiplex – A modulation scheme used for digital transmission that is employed by the European DVB system. It uses a very large number of carriers (hundreds or thousands), each carrying data at a very low rate. The system is relatively insensitive to doppler frequency shifts, and can use multipath signal constructively. It is, therefore, particularly suited for mobile reception and for single-frequency networks. A modified form of OFDM.

Coded Picture – An MPEG coded picture is made of a picture header, the optional extensions immediately following it, and the following compressed picture data. A coded picture may be a frame picture or a field picture.

Coded Representation – A data element as represented in its encoded form.

Coded Video Bitstream – A coded representation of a series of one or more VOPs as defined in this specification.

Code-Excited Linear Prediction – a) Audio encoding method for low bit rate codecs. **b)** CELP is a speech coding algorithm that produces high quality speech at low rates by using perceptual weighting techniques.

Coder-Decoder – Used to implement the physical combination of the coding and decoding circuits.

Coding – Representing each level of a video or audio signal as a number, usually in binary form.

Coding Parameters – The set of user-definable parameters that characterize a coded video bit stream. Bit streams are characterized by coding parameters. Decoders are characterized by the bit streams that they are capable of decoding.

Coefficient – a) A number (often a constant) that expresses some property of a physical system in a quantitative way. **b)** A number specifying the amplitude of a particular frequency in a transform.

Coefficient of Friction – The tangential force required to maintain (dynamic coefficient) or initiate (static coefficient) motion between two surfaces divided by the normal force pressing the two surfaces together.

Coefficient of Hygroscopic Expansion – The relative increase in the linear dimension of a tape or base material per percent increase in relative humidity measured in a given humidity range.

Coefficient of Thermal Expansion – The relative increase in the linear dimension of a tape or base material per degree rise in temperature (usually Fahrenheit) measured in a given temperature range.

Coefficient Recording – A form of data bit-rate reduction used by Sony in its digital Betacam format and with its D-2 component recording accessory, the DFX-C2. Coefficient recording uses a discrete cosine transformation and a proprietary information handling scheme to lower the data rate generated by a full bit-rate component digital signal. Such a data bit-rate reduction system allows component digital picture information to be recorded more efficiently on VTRs.

Coercivity – Measured in oersteds, the measurement of a magnetic characteristic. The demagnetizing force required to reduce the magnetic induction in a magnetic materiel to zero from its saturated condition.

COFDM (Coded Orthogonal Frequency Division Multiplex) – A digital coding scheme for carrying up to 6875 single carriers 1 kHz apart which are QAM modulated with up to 64 states. "Coded" means that the data to be modulated has error control. Orthogonality means that the spectra of the individual carriers do not influence each other as a spectral maximum always coincides with a spectrum zero of the adjacent carriers. A single-frequency network is used for the actual transmission.

Coherent – Two or more periodic signals that are phase-locked to a common submultiple. The subcarrier of a studio quality composite video signal is coherent with its sync.

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 collision.

Color Back Porch – Refer to the Horizontal Timing discussion.

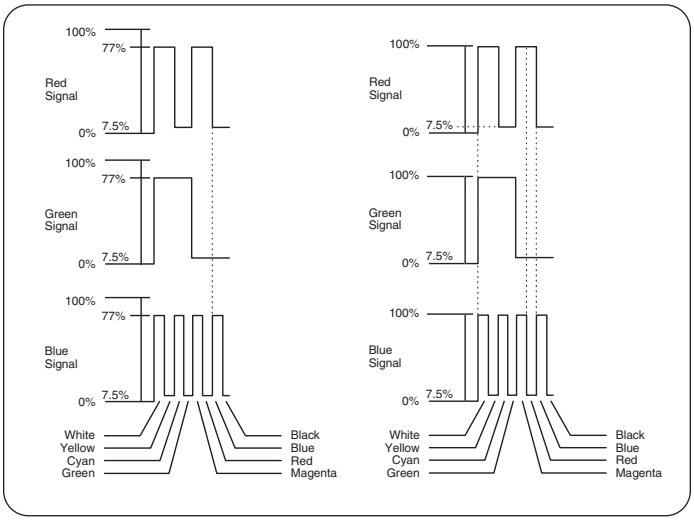
Color Background Generator – a) A circuit that generates a full-field solid color for use as a background in a video picture. **b)** A device that produces a full-frame color, normally used as a background for various graphics effects, the output of which is selectable on the last button of all switcher buses.

Color Balance – Adjustment of color in the camera to meet a desired standard, i.e., color bar, sponsor's product, flesh tones. Also may be referred to as "white balance".

Color Bar Test Signal – Originally designed to test early color camera encoders, it is commonly (albeit incorrectly) used as a standard test signal. The saturated color bars and luminance gray bar are usually used to check monitors for color accuracy. The saturated color bars are a poor test of any nonlinear circuit or system and at best, show video continuity. Testing a video system using color bars is analogous to testing an audio system using a simple set of monotonal frequencies. Many color TV test signals have been developed to accurately assess video processing equipment such as ADCs, compressors, etc.

Color Bars – A video test signal widely used for system and monitor setup. The test signal, typically containing eight basic colors: white, yellow, cyan, green, magenta, red, blue and black, is used to check chrominance functions of color TV systems. There are two basic types of color bar signals in common use. The terms "75% bars" and "100% bars" are generally used to distinguish between the two types. While this terminology is widely used, there is often confusion about exactly which parameters the 75% versus 100% notation refer to. **a) RGB Amplitudes –** The 75%/100% nomenclature specifically refers to the maximum amplitudes reached by the Red, Green and Blue signals when hey form the six primary and secondary colors required for color bars. For 75% bars, the maximum amplitude of the RGB signals is 75% of the peak white level. For 100% bars, the RGB signals can extend up to 100% of peak white. Refer to the following two figures. **b) Saturation –** Both 75% and 100% amplitude color bars are 100% saturated. In the RGB format, colors are saturated if at least one of the primaries is at zero. Note: In the two associated figures that the zero signal level is at setup (7.5 IRE) for NTSC. **c) The Composite Signal –** In the composite signal, both chrominance and luminance amplitudes vary according to the 75%/100% distinction. However, the ratio between chrominance and luminance amplitudes remains constant in order to

maintain 100% saturation. **d) White Bar Levels –** Color bar signals can also have different white bar levels, typically either 75% or 100%. This parameter is completely independent of the 75%/100% amplitude distinction and either white level may be associated with either type of bars. **e) Effects of Setup –** Because of setup, the 75% signal level for NTSC is at 77 IRE. The maximum available signal amplitude is 100-7.5 or 92.5 IRE. 75% of 92.5 IRE is 69.4 IRE, which when added to the 7.5 IRE pedestal yields a level of approximately 77 IRE.



Color Black – A composite video signal that produces a black screen when viewed on a television receiver.

Color Burst – a) The portion of a color video signal that resides on the backporch between the breezeway and the start of active video which contains a sample of the color subcarrier used to add color to a signal. It is used as a color synchronization signal to establish a reference for the color information following it and is used by a color monitor to decode the color portion of a video signal. The color burst acts as both amplitude and phase reference for color hue and intensity. The color oscillator of a color television receiver is phase locked to the color burst. **b)** A nine-cycle-NTSC burst of color subcarrier which is imposed on blanking after sync. Color burst serves as the reference for establishing the picture color.

Color Carrier – The sub-frequency in a color video signal (4.43 MHz for PAL) that is modulated with the color information. The color carrier frequency is chosen so its spectrum interleaves with the luminance spectrum with minimum interference.

Color Coordinate Transformation – Computation of the tristimulus values of colors in terms of one set of primaries from the tristimulus values of the same colors in another set of primaries. Note: This computation may be performed electrically in a color television system.

Color Correction – a) A process by which the coloring in a television image is altered or corrected electronically. Care must be taken to insure that the modified video does not exceed the limits of subsequent processing or transmission systems. **b)** The adjustment of a color reproduction process to improve the perceived-color conformity of the reproduction to the original.

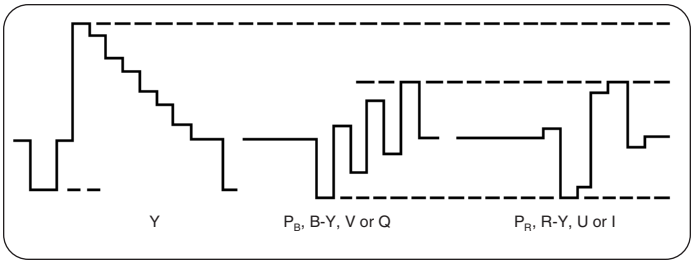
Color Cycling – A means of simulating motion in a video by changing colors.

Color Decoder – a) A device that divides a video signal into its basic color components. In TV and video, color decoding is used to derive signals required by a video monitor from the composite signals. **b)** Video function that obtains the two color difference signals from the chrominance part of an NTSC/PAL signal. See Chroma Demodulators.

Color Demodulator – See Chroma Demodulators.

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

Color Difference Signals – Signals used by color television systems to convey color information (not luminance) in such a way that the signals go to zero when there is no color in the picture. Color difference signal formats include: R-Y and B-Y; I and Q; U and V; PR and PB. The following figure show general color difference waveforms along with the Y signal. The color difference signal shown above must first be converted in their RGB form before they can recreate the picture. Refer to the RGB discussion to view what the RGB version of the color bar signal looks like. The color difference signals in the figure described above are centered around 0 volts but this is only true for the SMPTE/EBU N10 standard. The NTSC and M11 color difference standards have the most negative portions of the color difference signals riding on a voltage of 0 volts or close to it.



Color Edging – Spurious colors appearing along the edges of color pictures, but that do not have a color relationship to the picture.

Color Encoder – Performs the reverse function of the chroma demodulator in that it combines the two color difference signals into the single chroma signal.

Color Field – In the NTSC system, the color subcarrier is phase-locked to the line sync so that on each consecutive line, subcarrier phase is changed 180º with respect to the sync pulses. In the PAL system, color subcarrier phase moves 90º every frame. In NTSC this creates four different field types, while in PAL there are eight. In order to make clean edits, alignment of color field sequences from different sources is crucial.

Color Frame – a) In NTSC color television, it takes four fields to complete a color frame. In PAL, it takes eight fields. **b)** Polarity of the video frame. Color frame must alternate polarity with each frame to keep the video signal in phase. **c)** A sequence of video fields required to produce a complete pattern of both field and frame synchronization and color subcarrier synchronization. The NTSC system requires four fields; PAL requires eight.

Color Frame Timed – See the Color Framed discussion.

Color Framed – Two signals are said to be color framed at a switcher or router when their field 1, line 10 events (field 1, line 7 in PAL) occur at the same time at the input to the switcher or router. To prevent picture distortions when changing signals at a switcher or router, the signals must be color framed.

Color Gamut – In a system employing three color primaries to encode image color, each primary can be located on a CIE chromaticity diagram and these points connected as a plane figure. If the apexes are then connected with an appropriate value on the white point axis, a so) id figure is produced enclosing the color gamut for that system. (On the CIE chromaticity diagrams, the points in x, y, z space approximate an inverted tetrahedron. In u, v, w space, they become a somewhat irregular four-cornered solid.) Colors within the color gamut solid volume can be reproduced by the system as metameric matches. Colors outside the color gamut solid volume cannot be matched. Note: The area of the cross-section from the color gamut solid is a function of the luminance. Although it is advantageous to have the widest possible color gamut for the ability to provide metameric matches for the largest number of colors, the required transformations from origination colorimetry to colorimetry matched to available display primaries, for example, may require large matrix coefficients and, therefore, a signal-to-noise penalty. The choice of color gamut is a compromise between color rendition and signal-to-noise.

Color Key – See Chroma Key.

Color Keying – To superimpose one image over another for special effects.

Color Killer – Circuitry which disables the receiver's color decoder if the video does not contain color information.

Color Lookup Table (CLUT) – The CLUT is a compression scheme where pixel values in the bitmap represent an index into a color table where the table colors have more bits-per-pixel than the pixel values. In a system where each pixel value is eight bits, there are 256 possible values in the lookup table. This may seem a constraint but, since multiple lookup tables can be referenced, there can be many tables with varying 256 color schemes. CLUTs work best for graphics where colors do not have to be natural.

Color Map – A color map is just a numbered list of colors. Each color is specified in terms of its red, green, and blue components.

Color Map Animation – In normal animation, the images representing separate frames are written on separate pieces of artwork. In computer color map animation, many images can be written into a frame buffer, each with a different color number. By 'cycling' white, for example, through the color map, so that only one image at a time is visible, the illusion of animation can be achieved very quickly. PictureMaker's wireframe test mode works this way.

Color Mapping – Color mapping is distinguished by the following: **a)** Each pixel contains a color number (or address) referring to a position in a color map. Each pixel has 'n' bits, so there are '2 to the n' color map addresses. **b)** A hardware device called the color map defines the actual RGB values for each color.

Color Masking – A method of correcting color errors which are fundamental in any three primary color additive reproducing system, by electrically changing the R, G and B signals with a matrix or masking amplifier which mixes (usually subtracts) the signals in a very precise predetermined amount. The form is generally as follows. Note that a, b, c, d, e and f are referred to as the masking or correction coefficients.

R out = R in + a (G-R) + b (R-B)

G out = G in + c (G-R) + d (B-G)

B out = B in + e (R-B) + f (B-G)

Color Match, Corresponding – A corresponding color is defined as the stimulus that, under some different condition of adaptation, evokes the same color appearance as another stimulus when it was seen under the original state of adaptation. Color match, corresponding is a subjective judgment.

Color Match, Metameric – a) Color images are metameric matches when their spectrally different color stimuli have identical tristimulus values. The requirements for such a metameric match can be calculated for a specified viewing condition (and for viewing conditions other than those specified, the chromaticity will not be judged to correspond). **b)** The corresponding color chosen for the metameric match will not provide a spectrophotometric match. In practical applications, spectrophotometric matches are of only academic interest, and metameric matches are sought. **c)** Color match, metameric, resulting from calculations based upon colorimetry, produces a visual match as evaluated by the CIE description of human observers.

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

Color Modulator – See Color Encoder.

Color Palette – A component of a digital video system that provides a means of establishing colors (foreground and background) using a color lookup table to translate a limited set of pixel values into a range of displayable colors by converting the colors to RGB format.

Color Phase – a) The phase of the chroma signal as compared to the color burst, is one of the factors that determines a video signal's color balance. **b)** The timing relationship in a video signal that is measured in degrees and keeps the hue of a color signal correct.

Color Picker – A tool used to plot colors in an image.

Color Plane – In planar modes, the display memory is separated into four independent planes of memory, with each plane dedicated to controlling one color component (red, green, blue and intensify). Each pixel of the display occupies one bit position in each plane. In character modes and packed-pixel modes, the data is organized differently.

Color Primaries – Red, green and blue light.

Color Processing – A way to alter a video signal to affect the colors. The Video Equalizer is suited to this task. See Chroma Corrector.

Color Purity – Describes how close a color is to the mathematical representation of the color. 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 is really supposed to be. For a studio-grade device, the saturation is +/-2% and the hue is +/-2 degrees.

Color Reference Burst – The color synchronizing signal included as part of the overall composite video signal. When compared with the color subcarrier signal, the color reference burst determines the hue of the video image.

Color Reversal Intermediate (CRI) – A duplicate color negative prepared by reversal processing.

Color Saturation – This is the attribute of color perception determining the degree of its difference from the achromatic color perception most resembling it. An achromatic color perception is defined as one not possessing a hue/color. In other words, how much "color" is in an object.

Color Space – The mathematical representation of a color. a) Regardless of the color space used, RGB, YIQ, YUV, a color will appear the same on the screen. What is different is how the color is represented in the color space. In the HLS color space are represented based on three-dimensional polar coordinate system where as in the RGB color space, colors are represented by a Cartesian coordinate system. b) Many ways have been devised to organize all of a system's possible colors. Many of these methods have two things in common: a color is specified in terms of three numbers, and by using the numbers as axes in a 3D space of some sort, a color solid can be defined to represent the system. Two spaces are popular for computer graphics: RGB and HSV.

Color Space, Reference – Geometric representation of colors in space, usually of three dimensions. There are three reference spaces recognized by ISO 8613: CMYK color space; CIELuv color space; and R, G, B color space.

Color Standard – The parameters associated with transmission of color information. For example, RGB, YCbCr or MAC component color standards or NTSC, PAL or SECAM composite color standards.

Color Subcarrier – The signal used to modulate the color information in the color encoder and demodulate the color information in the color decoder. For (M) NTSC the frequency of the color subcarrier is about 3.579545 MHz and for (B, D, G, H, I) PAL it's about 4.43 MHz.

Color Temperature – The amount and color of light being given off by an object and is based on the concept of a "black body". A black absorbs all incident light rays and reflects none. If the black body is heated, it begins to emit visible light rays; first dull red, then red, then through orange to "white heat". It can be likened to the heating of metal. If a metal object is heated enough, the metal body will emit the array of colors mentioned above until the object achieves a bluish white light. The amount of light being emitted by the body can then be correlated to the amount of "heat" it would take to get the body that hot and that heat can be expressed in terms of degrees Kelvin. Objects that give off light equivalent to daylight have a temperature of about 6,500 degrees Kelvin. Colors with a bluish tint, have a color temperature of about 9,000 degrees Kelvin.

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.

Color Under – A degenerate form of composite color in which the subcarrier is crystal stable but not coherent with line rate. The term derives from the recording technique used in U-Matic, Betamax, VHS and 8 mm videotape recorders, where chroma is heterodyned onto a subcarrier whose frequency is a small fraction of that of NTSC or PAL. The heterodyning process looses the phase relationship of color subcarrier to sync.

Color Wheel – A circular graph that maps hue values around the circumference and saturation values along the radius. Used in the color correction tool as a control for making hue offset and secondary color correction adjustments.

Color, Additive – Over a wide range of conditions of observation, many colors can be matched completely by additive mixtures in suitable amounts of three fixed primary colors. The choice of three primary colors, though very wide, is not entirely arbitrary. Any set that is such that none of the primaries can be matched by a mixture of the other two can be used. It follows that the primary color vectors so defined are linearly independent. Therefore, transformations of a metameric match from one color space to another can be predicted via a matrix calculation. The limitations of color gamut apply to each space. The additive color generalization forms the basis of most image capture, and of most self-luminous displays (i.e., CRTs, etc.).

Color, Primary – a) The colors of three reference lights by whose additive mixture nearly all other colors may be produced. **b)** The primaries are chosen to be narrow-band areas or monochromatic points directed toward green, red, and blue within the Cartesian coordinates of three-dimensional color space, such as the CIE x, y, z color space. These primary color points together with the white point define the colorimetry of the standardized system. **c)** Suitable matrix transformations provide metameric conversions, constrained by the practical filters, sensors, phosphors, etc. employed in order to achieve conformance to the defined primary colors of the specified system. Similar matrix transformations compensate for the viewing conditions such as a white point of the display different from the white point of the original scene. **d)** Choosing and defining primary colors requires a balance between a wide color gamut reproducing the largest number of observable surface colors and the signal-to-noise penalties of colorimetric transformations requiring larger matrix coefficients as the color gamut is extended. **e)** There is no technical requirement that primary colors should be chosen identical with filter or phosphor dominant wavelengths. The matrix coefficients, however, increase in magnitude as the available display primaries occupy a smaller and smaller portion of the color gamut. (Thus, spectral color primaries, desirable for improved colorimetry, become impractical for CRT displays.) **f)** Although a number of primary color sets are theoretically interesting, CCIR, with international consensus, has established the current technology and practice internationally that is based (within measurement tolerances) upon the following: Red – x = 0.640, y = 0.330; Green – x = 0.300, y = 0.600; Blue – x = 0.150, y = 0.060. g) SMPTE offers guidance for further studies in improving color rendition by extending the color gamut. With regard to color gamut, it is felt that the system should embrace a gamut at least as large as that represented by the following primaries: Red – x = 0.670, y = 0.330; Green – x = 0.210, y = 0.710; Blue – x = 0.150, y = 0.060.

Color, Subjective – Subtractive colorimetry achieves metameric matching by removing portions of the spectrum from white light. The subtractive counterparts to the additive color primaries are those which when removed from white leave the red, green, and blue accordingly cyan, magenta, and yellow. Combinations of these subtractive colors in various add mixtures provide metameric matches to many colors. Subtractive color principles are employed in all hard-copy color images and in light-valve systems such as color transparencies, LCD panel display, motion-picture films, etc.

Colorimetry – a) Characteristics of color reproduction including the range of colors that a television system can reproduce. Some ATV schemes call for substantially different colorimetry (with a greater range) than NTSC's. **b)** The techniques for the measurement of color and for the interpretation of the results of such computations. Note: The measurement of color is made possible by the properties of the eye, and is based upon a set of conventions.

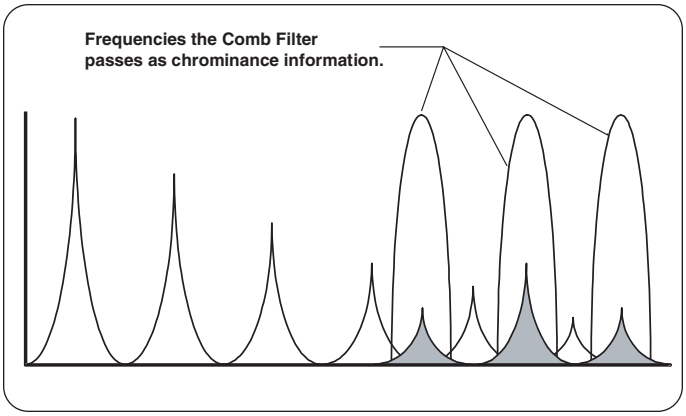
Colorist – The title used for someone who operates a telecine machine to transfer film to video. Part of the process involves correcting the video color to match the film.

Colorization – Special effect (also called paint) which colors a monochrome or color image with artificial colors. This feature is found on both the Digital Video Mixer and Video Equalizer.

Color-Matching Functions – a) The tristimulus values of monochromatic stimuli of equal radiant power. The three values of a set of color-matching functions at a given wavelength are called color-coefficients. The color-matching functions may be used to calculate the tristimulus values of a color stimulus from the color stimulus function. **b)** The tristimulus value per unit wavelength interval and unit spectral radiant flux. **c)** A set of three simultaneous equations used to transform a color specification from one set of matching stimuli to another. Note: Color-matching functions adopted by the CIE are tabulated as functions of wavelength throughout the spectrum and are given in Section 13.5 of ANSI/IES RP16-1986.

ColorStream, ColorStream Pro, ColorStream HD – The name Toshiba uses for the analog YPbPr video interface on their consumer equipment. If the interface supports progressive SDTV resolutions, it is called ColorStream Pro. If the interface supports HDTV resolutions, it is called ColorStream HD.

Comb Filter – This is a filter that can be used to separate luminance from chrominance in the NTSC or PAL composite video systems. The figure below shows a signal amplitude over frequency representation of the luminance and chrominance information that makes up the composite video signal. The peaks in gray are the chroma information at the color carrier frequency. Note how the chroma information falls between the luminance information that is in white. The comb filter is able to pass just energy found in the chroma frequency areas and not the luminance energy. This selective bandpass profile looks likes the teeth of a comb and thus the name comb filter. The comb filter has superior filtering capability when compared to the chroma trap because the chroma trap acts more like a notch filter.



Comb – Used on encoded video to select the chrominance signal and reject the luminance signal, thereby reducing cross-chrominance artifacts or conversely, to select the luminance signal and reject the chrominance signal, thereby reducing cross-luminance artifacts.

Combination Tone – A tone perceived by the ear which is equal in frequency to the sum or difference of the frequencies of two loud tones that differ by more than 50 Hz.

Combinational Logic – Circuit arrangement in which the output state is determined only by the present states of two or more inputs. Also called Combinatorial Logic.

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 channels (which picture appears in front and which in back) and the types of transitions that can take place between them.

Combo Box – In Microsoft™ Windows, a combination of a text and a list box. You can either type the desired value or select it from the list.

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

Command Buttons – In Microsoft™ Windows, "button-shaped" symbols that are "pressed" ("clicked on"/chosen) to perform the indicated action.

Comment Field – Field within an instruction that is reserved for comments. Ignored by the compiler or the assembler when the program is converted to machine code.

Common Carrier – Telecommunication company that provides communications transmission services to the public.

Common Data Rate (CDR) – In the search for a single worldwide standard for HDTV, one proposal is to establish a common data rate, to be independent of line structure, frame rate, and sync/blanking.

Common Image Format (CIF) – The standardization of the structure of the samples that represent the picture information of a single frame in digital HDTV, independent of frame rate and sync/blank structure.

Common Interchange Format (CIF) – A 352 x 240 pixel format for 30 fps video conferencing.

Common Interface Format (CIF) – This video format was developed to easily allow video phone calls between countries. The CIF format has a resolution of 352 x 288 active pixels and a refresh rate of 29.97 frames per second.

Common Intermediate Format (CIF) – Picture format. For this ITU defined CIF frame, Y is 352 pixels x 288 lines, and Cb and Cr are 176 pixels x 144 lines each. This frame structure is independent of frame rate and sync structure for all digital TV formats. Uncompressed bit rate is 36.45 Mbps at 29.97 frames/sec.

Communication Protocol – A specific software based protocol or language for linking several devices together. Communication protocols are used between computers and VCRs or edit controllers to allow bidirectional "conversation" between the units. See RS-232/RS-422.

Compact Cassette – A small (4 x 2-1/2 x 1/2") tape cartridge developed by Philips, containing tape about 1/7" wide, running at 1-7/8 ips. Recordings are bidirectional, with both stereo tracks adjacent for compatibility with monophonic cassette recorders; whose heads scan both stereo tracks at once.

Compact Disc (CD) – A compact disc is a 12cm optical disc that stores encoded digital information (typically audio) in the constant linear velocity (CLV) format. For high-fidelity audio/music, it provides 74 minutes of digital sound, 90 dB signal-to-noise ratio and no degradation from playback.

Compact Disc Interactive (CD-I) – It is meant to provide a standard platform for mass consumer interactive multimedia applications. So it is more akin to CD-DA, in that it is a full specification for both the data/code and standalone playback hardware: a CD-I player has a CPU, RAM, ROM, OS, and audio/video (MPEG) decoders built into it. Portable players add an LCD screen and speakers/phone jacks. It has limited motion video and still image compression capabilities. It was announced in 1986, and was in beta test by spring 1989. This is a consumer electronics format that uses the optical disc in combination with a computer to provide a home entertainment system that delivers music, graphics, text, animation, and video in the living room. Unlike a CD-ROM drive, a CD-I player is a standalone system that requires no external computer. It plugs directly into a TV and stereo system and comes with a remote control to allow the user to interact with software programs sold on discs. It looks and feels much like a CD player except that you get images as well as music out of it and you can actively control what happens. In fact, it is a CD-DA player and all of your standard music CDs will play on a CD-I player; there is just no video in that case. For a CD-I disk, there may be as few as 1 or as many as 99 data tracks. The sector size in the data tracks of a CD-I disk is approximately 2 kbytes. Sectors are randomly accessible, and, in the case of CD-I, sectors can be multiplexed in up to 16 channels for audio and 32 channels for all other data types. For audio these channels are equivalent to having 16 parallel audio data channels instantly accessible during the playing of a disk.

Compact Disc Read Only Memory – a) CD-ROM means "Compact Disc Read Only Memory". A CD-ROM is physically identical to a Digital Audio Compact Disc used in a CD player, but the bits recorded on it are interpreted as computer data instead of music. You need to buy a CD-ROM Drive and attach it to your computer in order to use CD-ROMs. A CD-ROM has several advantages over other forms of data storage, and a few disadvantages. A CD-ROM can hold about 650 megabytes of data, the equivalent of thousands of floppy disks. CD-ROMs are not damaged by magnetic fields or the x-rays in airport scanners. The data on a CD-ROM can be accessed much faster than a tape, but CD-ROMs are 10 to 20 times slower than hard disks. **b)** A flat metallic disk that contains information that you can view and copy onto your own hard disk; you cannot change or add to its information.

Companding – See Compressing-Expanding.

Comparator – A circuit that responds to the relative amplitudes of two inputs, A and B, by providing a binary output, Z, that indicates A>B or A<B.. The comparator has two inputs, X, Y, and one output, Z. A comparator "compares" A to B. If A is larger than B, the output of the comparator is a "1". If A is smaller than B, then the output is a "0". If A = B, the output Z may be undefined and oscillate between "1" and "0" wildly until that condition is removed it may be a "1", or it may be a "0". It depends on how the comparator was designed. The comparator implements the following mathematical function.

If $A - B > 0$, then $Z = 1$

If $A - B < 0$, then $Z = 0$

Compatibility – A complex concept regarding how well ATV schemes work with existing television receivers, transmission channels, home video equipment, and professional production equipment. See also Channel-Compatible, Receiver-Compatible.

A. ATV Receiver Compatibility Levels
   - Level 5 – ATV signal is displayed as ATV on an NTSC TV set
   - Level 4 – ATV signal appears as highest quality NTSC on an NTSC TV set
   - Level 3 – ATV signal appears as reduced quality NTSC on an NTSC TV set
   - Level 2 – ATV signal requires inexpensive adapter for an NTSC TV set
   - Level 1 – ATV signal requires expensive adaptor for an NTSC TV set
   - Level 0 – ATV signal cannot be displayed on an NTSC TV set

B. Compatible ATV Transmission Schemes
   - Receiver-compatible and channel-compatible single 6 MHz channel
   - Receiver-compatible channel plus augmentation channel
   - Necessarily adjacent augmentation channel
   - Not necessarily adjacent augmentation channel
   - Non-receiver-compatible channel plus simulcast channel

Compatible Video Consortium (CVC) – An organization established by Cox Enterprises and Tribune Broadcasting, which together own 14 television stations, 24 CATV systems, and two production companies. The CVC, which is open to other organizations, was created to support ATV research and is currently supporting Del Ray's HD-NTSC system.

Compile – 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 called Render.

Compiler – Translation program that converts high-level program instructions into a set of binary instructions (machine code) for execution. Each high-level language requires a compiler or an interpreter. A compiler translates the complete program, which is then executed.

Complement – Process of changing each 1 to a 0 and each 0 to a 1.

Complex Surface – Consists of two or more simple surfaces attached or connected together using specific operations.

Component – a) A matrix, block or single pel from one of the three matrices (luminance and two chrominance) that make up a picture. **b)** A television system in which chrominance and luminance are distributed separately; one of the signals of such a television system; or one of the signals that comprise an ATV system (e.g., the widescreen panels component).

Component (Elementary Stream) – One or more entities which together make up an event, e.g., video, audio, teletext.

Component Analog – The unencoded output of a camera, videotape recorder, etc., consisting of three primary color signals: red, green, and blue (RGB) that together convey all necessary picture information. In some component video formats, these three components have been translated into a luminance signal and two color difference signals, for example, Y, B-Y, R-Y.

Component Color – Structure of a video signal wherein the R', G', and B' signals are kept separate from each other or wherein luminance and two band-limited color-difference signals are kept separate from one another. The separation may be achieved by separate channels, or by time-division multiplexing, or by a combination of both.

Component Digital – A digital representation of a component analog signal set, most often Y, B-Y, R-Y. The encoding parameters are specified by CCIR 601. The parallel interface is specified by ITU-r BT.601-2 656 and SMPTE 125M (1991).

Component Digital Post Production – A method of post production that records and processes video completely in the component digital domain. Analog sources are converted only once to the component digital format and then remain in that format throughout the post production process.

Component Gain Balance – This refers to ensuring that each of the three signals that make up the CAV information are amplified equally. Unequal amplification will cause picture lightness or color distortions.

Component Video – Video which exists in the form of three separate signals, all of which are required in order to completely specify the color picture with sound. Most home video signals consist of combined (composite) video signals, composed of luminance (brightness) information, chrominance (color) information and sync information. To get maximum video quality, professional equipment (Betacam and MII) and some consumer equipment (S-VHS and Hi-8) keep the video components separate. Component video comes in several varieties: RGB (red, green, blue), YUV (luminance, sync, and red/blue) and Y/C (luminance and chrominance), used by S-Video (S-VHS and Hi-8) systems. All Videonics video products support the S-Video (Y/C) component format in addition to standard composite video.

Composite – A television system in which chrominance and luminance are combined into a single signal, as they are in NTSC; any single signal comprised of several components.

Composite Analog – An encoded video signal, such as NTSC or PAL video, that includes horizontal and vertical synchronizing information.

Composite Blanking – The complete television blanking signal composed of both line rate and field rate blanking signals. See Line Blanking and Field Blanking.

Composite Chroma Key – a) Also known as encoded chroma key. A chroma key which is developed from a composite video source, i.e., off of tape, rather than the components, i.e., RGB, R-Y B-Y. **b)** A chroma key wherein the keying signal is derived from a composite video signal, as opposed to an RGB chroma key. See Chroma Key.

Composite Color – Structure of a video signal wherein the luminance and two band-limited color-difference signals are simultaneously present in the channel. The format may be achieved by frequency-division multiplexing, quadrature modulation, etc. It is common to strive for integrity by suitable separation of the frequencies, or since scanned video signals are highly periodic, by choosing frequencies such that the chrominance information is interleaved within spectral regions of the luminance signal wherein a minimum of luminance information resides.

Composite Color Signal – A signal consisting of combined luminance and chrominance information using frequency domain multiplexing. For example, NTSC and PAL video signals.

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

Composite Image – An image that contains elements selected from two or more separately originated images.

Composite Print – A motion picture print with both picture and sound on the same strip of film.

Composite Sync – a) Horizontal and vertical sync pulses combined. Often referred to simply as "sync". Sync is used by source and monitoring equipment. **b)** A signal consisting of horizontal sync pulses, vertical sync pulses and equalizing pulses only, with a no-signal reference level.

Composite Video – a) A single video signal containing all of the necessary information to reproduce a color picture. Created by adding quadrature amplitude modulated R-Y and B-Y to the luminance signal. A video signal that contains horizontal, vertical and color synchronizing information. **b)** A complete video including all synchronizing pulses, may have all values of chroma, hue and luminance, may also be many sources layered.

Composite Video Signal – A signal in which the luminance and chrominance information has been combined using one of the coding standards NTSC, PAL, SECAM, etc.

Composited Audiovisual Object (Composited AV Object) – The representation of an AV object as it is optimized to undergo rendering.

Compositing – Layering multiple pictures on top of each other. A cutout or matte holds back the background and allows the foreground picture to appear to be in the original picture. Used primarily for special effects.

Composition – a) Framing or makeup of a video shot. **b)** The process of applying scene description information in order to identify the spatio-temporal attributes of media objects.

Composition Information – See Scene Description.

Composition Layer – The MPEG-4 Systems Layer that embed the component sub-objects of a compound AV object in a common representation space by taking into account the spatio-temporal relationships between them (Scene Description), before rendering the scene.

Composition Memory (CM) – A random access memory that contains composition units.

Composition Parameters – Parameters necessary to compose a scene (place an object in a scene). These include displacement from the upper left corner of the presentation frame, rotation angles, zooming factors.

Composition Time Stamp (CTS) – An indication of the nominal composition time of a composition unit.

Composition Unit (CU) – An individually accessible portion of the output that a media object decoder produces from access units.

Compress – a) The process of converting video and audio data into a more compact form for storage or transmission. **b)** A digital picture manipulator effect where the picture is squeezed (made proportionally smaller).

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-Expanding – Analog compression is used at one point in the communications path to reduce the amplitude range of the signals, followed by an expander to produce a complementary increase in the amplitude range.

Compression – a) The process of electronically processing a digital video picture to make it use less storage or to allow more video to be sent down a transmission channel. **b)** The process of removing picture data to decrease the size of a video image. **c)** The reduction in the volume of data from any given process so that more data can be stored in a smaller space. There are a variety of compression schemes that can be applied to data of which MPEG-1 and MPEG-2 are called lossy since the data produced by compression is not totally recoverable. There are other compression schemes that are totally recoverable, but the degree of compression is much more limited.

Compression (Amplitude) – a) Data Transmission – A process in which the effective gain applied to a signal is varied as a function of the signal magnitude, the effective gain being greater for small rather than for large signals. **b) Video –** The reduction in amplitude gain at one level of a picture signal with respect to the gain at another level of the same signal. Note: The gain referred to in the definition is for a signal amplitude small in comparison with the total peak-to-peak picture signal involved. A quantitative evaluation of this effect can be obtained by a measurement of differential gain. **c) Production –** A transfer function (as in gamma correction) or other nonlinear adjustment imposed upon signal amplitude values.

Compression (Bit Rate) – Used in the digital environment to describe initial digital quantization employing transforms and algorithms encoding data into a representation that requires fewer bits or lower data rates or processing of an existing digital bit stream to convey the intended information in fewer bits or lower data rate. Compression (bit rate) may be reversible compression, lossless or it may be irreversible compression, lossy.

Compression Artifacts – Small errors that result in the decompressed signal when a digital signal is compressed with a high compression ratio. 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 por-tions, to be displayed with the movement distorted or missing.

Compression Factor – Ratio of input bit rate to output (compressed) bit rate. Like Compression Ratio.

Compression Layer – The layer of an ISO/IEC FCD 14496 system that translates between the coded representation of an elementary stream and its decoded representation. It incorporates the media object decoders.

Compression Ratio – A value that indicates by what factor an image file has been reduced after compression. If a 1 MB image file is compressed to 500 KB, the compression ratio would be a factor of 2. The higher the ratio the greater the compression.

Compression, Lossless – Lossless compression requires that the reproduced reconstructed bit stream be an exact replica of the original bit stream. The useful algorithms recognize redundancy and inefficiencies in the encoding and are most effective when designed for the statistical properties of the bit stream. Lossless compression of image signal requires that the decoded images match the source images exactly. Because of differences in the statistical distributions in the bit streams, different techniques have thus been found effective for lossless compression of either arbitrary computer data, pictures, or sound.

Compression, Lossy – Bit-rate reduction of an image signal by powerful algorithms that compress beyond what is achievable in lossless compression, or quasi-lossless compression. It accepts loss of information and introduction of artifacts which can be ignored as unimportant when viewed in direct comparison with the original. Advantage is taken of the subtended viewing angle for the intended display, the perceptual characteristics of human vision, the statistics of image populations, and the objectives of the display. The lost information cannot be regenerated from the compressed bit stream.

Compression, Quasi-Lossless – Bit-rate reduction of an image signal, by an algorithm recognizing the high degree of correlation ascertainable in specific images. The reproduced image does not replicate the original when viewed in direct comparison, but the losses are not obvious or recognizable under the intended display conditions. The algorithm may apply transform coding, predictive techniques, and other modeling of the image signal, plus some form of entrophy encoding. While the image appears unaltered to normal human vision, it may show losses and artifacts when analyzed in other systems (i.e., chroma key, computerized image analysis, etc.). The lost information cannot be regenerated from the compressed bit stream.

Compressionist – One who controls the compression process to produce results better than would be normally expected from an automated system.

Compressor – An analog device that reduces the dynamic range of a signal by either reducing the level of loud signals or increasing the level of soft signals when the combined level of all the frequencies contained in the input is above or below a certain threshold level.

Computer – General purpose computing system incorporating a CPU, memory, I/O facilities, and power supply.

Computer Input – Some HDTV sets have an input (typically SVGA or VGA) that allows the TV set to be connected to a computer.

Computer Television – Name of a Time Inc. pay-TV company that pre-dated HBO; also an unrealized concept created by Paul Klein, the company's founder, that would allow viewers access to a vast selection of television programming with no temporal restrictions, in the same way that telephone subscribers can call any number at any time. B-ISDN might offer the key to the transmission problem of computer television; the random-access library-storage problems remain.

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. See also Mole Technology.

Concave Lens – A lens that has negative focal length, i.e., the focus is virtual and it reduces the objects.

Condenser Mike – A microphone which converts sound pressure level variations into variations in capacitance and then into electrical voltage.

Condition Code – Refers to a limited group of program conditions, such as carry, borrow, overflow, etc., that are pertinent to the execution of instructions. The codes are contained in a condition code register. Same as Flag Register.

Conditional Access (CA) – This is a technology by which service providers enable subscribers to decode and view content. It consists of key decryption (using a key obtained from changing coded keys periodically sent with the content) and descrambling. The decryption may be proprietary (such as Canal+, DigiCipher, Irdeto Access, Nagravision, NDS, Viaccess, etc.) or standardized, such as the DVB common scrambling algorithm and OpenCable. Conditional access may be thought of as a simple form of digital rights management. Two common DVB conditional access (CA) techniques are SimulCrypt and MultiCrypt. With SimulCrypt, a single transport stream can contain several CA systems. This enables receivers with different CA systems to receive and correctly decode the same video and audio streams. With MultiCrypt, a receiver permits the user to manually switch between CA systems. Thus, when the viewer is presented with a CA system which is not installed in his receiver, they simply switch CA cards.

Conditional Access System – A system to control subscriber access to services, programs and events, e.g., Videoguard, Eurocrypt.

Conditional Jump or Call – Instruction that when reached in a program will cause the computer either to continue with the next instruction in the original sequence or to transfer control to another instruction, depending on a predetermined condition.

Conductive Coatings – Coatings that are specially treated to reduce the coating resistance, and thus prevent the accumulation of static electrical charge. Untreated, non-conductive coatings may become highly charged, causing transport, noise and dust-attraction problems.

Conferencing – The ability to conduct real-time interactive video and/or audio and/or data meetings via communication services over local or wide area networks.

Confidence Test – A test to make sure a particular device (such as the keyboard, mouse, or a drive) is set up and working properly.

Confidence Value – A measurement, expressed as a percentage, of the probability that the pattern the system finds during a motion tracking operation is identical to the pattern for which the system is searching. During a motion tracking operation, Avid Symphony calculates a confidence value for each tracking data point it creates.

CONFIG.SYS – A file that provides the system with information regarding application requirements. This information may include peripherals that are connected and require special drivers (such as a mouse). Other information that might be specified is the number of files that can be open simultaneously, or the number of disk drives that can be accessed.

Configuration File – A system file that you change to customize the way your system behaves. Such files are sometimes referred to as customization files.

Conform – To prepare a complete version of your project for viewing. The version produced might be an intermediate working version or the final cut.

Conforming – The process wherein an offline edited master is used as a guide for performing final edits.

Conforming a Film Negative – The mathematical process that the editing system uses to ensure that the edits made on a videotape version of a film project (30 fps) are frame accurate when they are made to the final film version (24 fps).

Connection-Oriented Protocol – In a packet switching network, a virtual circuit can be formed to emulate a fixed bandwidth switched circuit, for example, ATM. This benefits transmission of media requiring constant delays and bandwidth.

Connector – Hardware at the end of a cable that lets you fasten the cable to an outlet, port, or another connector.

Console – A display that lists the current system information and chronicles recently performed functions. It also contains information about particular items being edited, such as the shots in the sequence or clips selected from bins.

Console Window – The window that appears each time you log in. IRIX reports all status and error messages to this window.

Consolidate – To make copies of media files or portions of media files, and then save them on a drive. The consolidate feature operates differently for master clips, subclips and sequences.

Constant – a) A fixed value. **b)** An option for the interpolation and/or extrapolation of an animation curve that produces a square or stepped curve.

Constant Alpha – A gray scale alpha plane that consists of a constant non-zero value.

Constant Bit Rate (CBR) – a) An operation where the bit rate is constant from start to finish of the compressed bit stream. **b)** A variety of MPEG video compression where the amount of compression does not change. **c)** Traffic that requires guaranteed levels of service and throughput in delay-sensitive applications such as audio and video that are digitized and represented by a continuous bit stream.

Constant Bit Rate Coded Media – A compressed media bitstream with a constant average bit rate. For example, some MPEG video bitstreams.

Constant Bit Rate Coded Video – A compressed video bit stream with a constant average bit rate.

Constant Luminance Principle – A rule of composite color television that any change in color not accompanied by a change in brightness should not have any effect on the brightness of the image displayed on a picture tube. The constant luminance principle is generally violated by existing NTSC encoders and decoders. See also Gamma.

Constant Shading – The simplest shading type is constant. The color of a constant shaded polygon's interior pixels is always the same, regardless of the polygon's orientation with respect to the viewer and light sources. Constant shading is useful for creating light sources, for example. With all other shading types, a polygon changes its shade as it moves.

Constellation Diagram – A display used within digital modulation to determine the health of the system. It consists of a plot of symbol values onto an X-Y display, similar to a vectorscope display. The horizontal axis is known as the In-Phase (I) and the vertical axis is known as the Quadrature Phase (Q) axis. The position of the symbols within the constellation diagram provides information about distortions in the QAM or QPSK modulator as well as about distortions after the transmission of digitally coded signals.

Constrained Parameters – MPEG-1 video term that specifies the values of the set of coding parameters in order to assure a baseline interoperability.

Constrained System Parameter Stream (CSPS) – An MPEG-1 multiplexed system stream to which the constrained parameters are applied.

Constructive Solid Geometry (CSG) – This way of modeling builds a world by combining "primitive" solids such as cubes, spheres, and cones. The operations that combine these primitives are typically union, intersection, and difference. These are called Boolean operations. A CSG database is called a CSG tree. In the tree, branch points indicate the operations that take place on the solids that flow into the branch point.

Content – The program content will consist of the sum total of the essence (video, audio, data, graphics, etc.) and the metadata. Content can include television programming, data and executable software.

Content Object – The object encapsulation of the MPEG-4 decoded representation of audiovisual data.

Content-Based Image Coding – The analysis of an image to recognize the objects of the scene (e.g., a house, a person, a car, a face,...). The objects, once recognized are coded as parameters to a general object model (of the house, person, car, face,...) which is then synthesized (i.e., rendered) by the decoder using computer graphic techniques.

Continuation Indicator (CI) – Indicates the end of an object in the current packet (or continuation).

Continuous Monitoring – The monitoring method that provides continuous real-time monitoring of all transport streams in a network.

Continuous Tone – An image that has all the values (0 to 100%) of gray (black and white) or color in it. A photograph is a continuous tone image.

Contour Enhancement – A general term usually intended to include both aperture correction and edge enhancement.

Contouring – a) Video picture defect due to quantizing at too coarse a level. The visual effect of this defect is that pictures take on a layered look somewhat like a geographical contoured map. **b)** 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 brightness.

Contrast – Contrast describes the difference between the white and black levels in a video waveform. If there is a large difference between the white and black picture levels, the image has high contrast. If there is a small difference between the white and black portions of the picture, then the picture has low contrast and takes on a gray appearance.

Contrast Ratio – a) Related to gamma law and is a measurement of the maximum range of light to dark objects that a television system can reproduce. **b)** The comparison of the brightest part of the screen to the darkest part of the screen, expressed as a ratio. The maximum contrast ratio for television production is 30 x 1.

Contribution – A form of signal transmission where the destination is not the ultimate viewer and where processing (such as electronic matting) is likely to be applied to the signal before it reaches the ultimate viewer. Contribution demands higher signal quality than does distribution because of the processing.

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 Block – Circuits that perform the control functions of the CPU. They are responsible for decoding instructions and then generating the internal control signals that perform the operations requested.

Control Bus – Set of control lines in a computer system. Provides the synchronization and control information necessary to run the system.

Control Channel – A logical channel which carries control messages.

Control Layer – The MPEG-4 Systems Layer that maintains and updates the state of the MPEG-4 Systems Layers according to control messages or user interaction.

Control Menu Box – Located on the upper left corner of all application windows, document windows, and dialog boxes, it sizes (maximize, minimize, or restore) or exits the window.

Control Message – An information unit exchanged to configure or modify the state of the MPEG-4 systems.

Control Point – A location on a Bézier curve that controls its direction. Each control point has two direction handles that can extend from it.

Control Processor Unit/Central Processing Unit (CPU) – a) Circuits used to generate or alter control signals. **b)** A card in the frame which controls overall switcher operation.

Control Program – Sequence of instructions that guide the CPU through the various operations it must perform. This program is stored permanently in ROM where it can be accessed by the CPU during operation. Usually this ROM is located within the microprocessor chip. Same as Microprogram or Microcode.

Control Room – The enclosed room where the electronic control system for radio and television are located and where the director and technical director sit.

Control Signal – A signal used to cause an alteration or transition of video signals.

Control Track – a) The magnetized portion along the length of a videotape on which sync control information is placed. The control track contains a pulse for each video field and is used to synchronize the tape and the video signal. **b)** A synchronizing signal on the edge of the tape which provides a reference for tracking control and tape speed. Control tracks that have heavy dropouts are improperly recorded and may cause tracking defects or picture jumps. **c)** A signal recorded on videotape to allow the tape to play back at a precise speed in any VTR. Analogous to the sprocket holes on film. **d)** A linear track, consisting of 30-or 60-Hz pulses, placed on the bottom of videotape that aids in the proper playback of the video signal.

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 Timecode Editing.

Control Track Editor – Type of editing system that uses frame pulses on the videotape control track for reference.

Control-L (LANC)– Sony's wired edit control protocol, also called LANC (Local Application Control), which allows two-way communication between a camcorder or VCR and an edit controller such as the Thumbs Up. Control-L allows the controller to control the deck (fast forward, play, etc.) and also allows the controller to read the tape position (tape counter) information from the deck.

Control-M – Panasonic's wired edit control protocol. Similar to Control-L in function but not compatible. Also called Panasonic 5-pin edit control. See Control-L.

Control-S – Sony wired transport control protocol that duplicates a VCR's infra-red remote transport control (play, stop, pause, fast forward and rewind). Unlike Control-L, Control-S does not allow the controller to read tape counter information.

Control-T – Similar to Control-L but allows multiple units to be controlled. Not used in current equipment.

Conventional Definition Television (CDTV) – This term is used to signify the analog NTSC television system as defined in ITU-R Recommendation 470. See also Standard Definition Television and ITU-R Recommendation 1125.

Convergence – The act of adjusting or the state of having adjusted, the Red, Green and Blue color gun deflection such that the electron beams are all hitting the same color triad at the same time.

Conversion Ratio – The size conversion ratio for the purpose of rate control of shape.

Conversion, Frame-Rate – Standardized image systems now exist in the following frame rates per second: 24, 25, 29.97, 30, and 60. In transcoding from one system to another, frame rate conversion algorithms perform this conversion. The algorithm may be as simple as to drop or add frames or fields, or it may process the information to generate predictive frames employing information from the original sequence. In interlace systems, the algorithm may be applied independently to each field.

Converter – Equipment for changing the frequency of a television signal such as at a cable head-end or at the subscriber's receiver.

Convex Lens – A convex lens has a positive focal length, i.e., the focus is real. It is usually called magnifying glass, since it magnifies the objects.

Convolutional Coding – The data stream to be transmitted via satellite (DVB-S) which is loaded bit by bit into shift registers. The data which is split and delayed as it is shifted through different registers is combined in several paths. This means that double the data rate (two paths) is usually obtained. Puncturing follows to reduce the data rate: the time sequence of the bits is predefined by this coding and is represented by the trellis diagram.

Coordination System – See Reference.

CORBA (Common Object Request Broker Architecture) – A standard defined by the Common Object Group. It is a framework that provides interoperability between objects built in different programming languages, running on different physical machines perhaps on different networks. CORBA specifies an Interface Definition Language, and API (Application Programming Interface) that allows client / server interaction with the ORB (Object Request Broker).

Core – Small magnetic toruses of ferrite that are used to store a bit of information. These can be strung on wires so that large memory arrays can be formed. The main advantage of core memory is that it is nonvolatile.

Core Experiment – Core experiments verify the inclusion of a new technique or set of techniques. At the heart of the core experiment process are multiple, independent, directly comparable experiments, performed to determine whether or not proposed algorithmic techniques have merits. A core experiment must be completely and uniquely defined, so that the results are unambiguous. In addition to the specification of the algorithmic technique(s) to be evaluated, a core experiment also specifies the parameters to be used (for example, audio sample rate or video resolution), so that the results can be compared. A core experiment is proposed by one or more MPEG experts, and it is approved by consensus, provided that two or more independent experts carry out the experiment.

Core Visual Profile – Adds support for coding of arbitrary-shaped and temporally scalable objects to the Simple Visual Profile. It is useful for applications such as those providing relatively simple content interactivity (Internet multimedia applications).

Coring – A system for reducing the noise content of circuits by removing low-amplitude noise riding on the baseline of the signals. Both aperture correction and enhancement can be cored. It involves preventing any boosting of very low level edge transitions. The threshold point is the coring control. The more the coring is increased, the more the extra noise added by the enhanced (or aperture corrector) high frequency boosting is reduced. Of course, the fine detail enhancement is also reduced or eliminated. Too high levels of coring can cause a "plastic picture" effect.

Correlation – A comparison of data which is used to find signals in noise or for pattern recognition. It uses a best-match algorithm which compares the data to the reference.

Co-Sited Sampling – Co-sited sampling ensures that the luminance and the chrominance digital information is simultaneous, minimizing chroma/luma delay. This sampling technique is applied to color difference component video signals: Y, Cr, and Cb. The color difference signals, Cr and Cb, are sampled at a sub-multiple of Y, the luminance frequency – 4:2:2, for example. With co-sited sampling, the two color difference signals are sampled at the same instant, as well as one of the luminance samples.

Co-Siting – Relates to SMPTE 125M component digital video, in which the luminance component (Y) is sampled four times for every two samples of the two chrominance components (Cb and Cr). Co-siting refers to delaying transmission of the Cr component to occur at the same time as the second sample of luminance data. This produces a sampling order as follows: Y1/Cb1, Y2/Cr1, Y3/Cr3, Y4/Cb3 and so on. Co-siting reduces required bus width from 30 bits to 20 bits.

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

CPE (Common Phase Error) – Signal distortions that are common to all carriers. This error can (partly) be suppressed by channel estimation using the continual pilots.

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

CPPM (Content Protection for Prerecorded Media) – Copy protection for DVD-Audio.

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

CPRM (Content Protection for Recordable Media) – Copy protection for writable DVD formats.

CPS – Abbreviation for Characters Per Second.

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

CPSA (Content Protection System Architecture) – An overall copy protection design for DVD.

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

CPU – See Central Processing Unit.

CPU Board – The printed circuit board within a workstation chassis that contains the central processing unit(s). When you open the front metal panel of the Indigo chassis, it is the board on the left.

CPV – This is a proprietary and relatively old format designed for 30 fps video over packet based networks. It is still being used in closed video systems where 30 fps is required, such as in security applications.

C_R – Scaled version of the R-Y signal.

Crash Edit – An edit that is electronically unstable, such as one made using the pause control on a deck, or using a non-capstan served deck.

Crash Recording – See Hard Recording.

Crawl – a) Titles that move slowly up the screen, mounted on a revolving drum. **b)** Sideways movement of text across a screen. **c)** An appearance of motion in an image where there should be none. See also Chroma Crawl and Line Crawl.

Crawling Text – Text that moves horizontally over time. Examples include stock and sports score tickers that appear along the bottom of a television screen.

CRC – See Cyclic Redundancy Check.

Crease – A tape deformity which may cause horizontal or vertical lines in the playback picture. See Wrinkle.

Credits – Listing of actors, singers, directors, etc., in title preceding or directly following the program.

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 is the creepy-crawlies. Some people refer to this as zipper because it looks like one.

Crispening – A means of increasing picture sharpness by generating and applying a second time derivative of the original signal.

Critical Band – Frequency band of selectivity of the human ear which is a psychoacoustic measure in the spectral domain. Units of the critical band rate scale are expressed as Barks.

Crop – Term used for the action of moving left, right, top and bottom boundaries of a key. See Trim.

Crop Box – A box that is superimposed over frames, either automatically or manually, to limit color corrections, key setups, etc., to the area inside the box.

Cropping – A digital process which removes areas of a picture (frame) by replacing video pixels with opaque pixels of background colors. Cropping may be used to eliminate unwanted picture areas such as edges or as quasi-masking in preparation for keying.

Cross Color – Spurious signal resulting from high-frequency luminance information being interpreted as color information in decoding a composite signal. Typical video examples are "rainbow" on venetian blinds and striped shirts.

Cross Luma – This occurs when the video decoder incorrectly interprets chroma information (color) to be high-frequency luma information (brightness).

Cross Luminance – Spurious signals occurring in the Y channel as a result of composite chroma signals being interpreted as luminance, such as "dot crawl" or "busy edges" on colored areas.

Cross Mod – A test method for determining the optimum print requirements for a variable area sound track.

Cross Modulation – See Chrominance-to-Luminance Intermodulation.

Cross-Assembler – Assembler that runs on a processor whose assembly language is different from the language being assembled.

Cross-Color – An artifact observed in composite systems employing quadrature modulation and frequency interleaving. Cross-color results from the multiplicities of line-scan harmonics in the baseband signal, which provide families of frequencies surrounding each of the main harmonic peaks. These families become even more complex if there is movement in the scene luminance signals between scans. Since the interstices are, therefore, not completely empty, some of the information on the luminance signal is subsequently decoded as color information. A typical visible effect is a moiré pattern.

Crossfade – The audio equivalent of the video dissolve where one sound track is gradually faded out while a second sound track simultaneously replaces the original one. See Mix.

Crosshatch – A test pattern consisting of vertical and horizontal lines used for converging color monitors and cameras.

Cross-Luminance – An artifact observed in composite systems employing quadrature modulation and frequency interleaving. As the analog of cross-color, cross luminance results in some of the information carried by the chrominance signal (on color subcarrier) being subsequently interpreted as fine detail luminance information. A typical visible effect is chroma crawl and visible subcarrier.

Cross-Luminance Artifacts – Introduced in the S-VHS concept for a better luminance resolution.

Crossover Network – A device which divides a signal into two or more frequency bands before low frequency outputs of a crossover network. The level of each output at this frequency is 3 dB down from the flat section of the crossover's frequency response curve.

Cross-Play – By cross-play capability is meant the ability to record and reproduce on the same or a different machine; record at one speed and reproduce at the same or a different speed; accomplish the foregoing singly or in any combination without readjustment for tape or transport type.

Crosspoint – a) The electronic circuit used to switch video, usually on a bus. **b)** An electronic switch, usually controlled by a push-button on the panel, or remotely by computer that allows video or audio to pass when the switch is closed.

Cross-Sectional Modeling – This type of modeling is also a boundary representation method available in PictureMaker. The artist can define an object's cross-section, and then extrude in the longitudinal direction after selecting an outline to define the cross-section's changes in scale as it traverses the longitudinal axis.

Crosstalk – The interference between two audio or two video signals caused by unwanted stray signals. **a)** In video, crosstalk between input channels can be classified into two basic categories: luminance/sync crosstalk; and color (chroma) crosstalk. When video crosstalk is too high, ghost images from one source appear over the other. **b)** In audio, signal leakage, typically between left and right channels or between different inputs, can be caused by poor grounding connections or improperly shielded cables. See Chrominance-to-Luminance Intermodulation.

Crosstalk Noise – The signal-to-crosstalk noise ratio is the ratio, in decibels, of the nominal amplitude of the luminance signal (100 IRE units) to the peak-to-peak amplitude of the interfering waveform.

CRT (Cathode Ray Tube) – There are three forms of display CRTs in color television: tri-color (a color picture tube), monochrome (black and white), and single color (red, green, or blue, used in projection television systems). Many widescreen ATV schemes would require a different shape CRT, particularly for direct-view systems.

CRT Terminal – Computer terminal using a CRT display and a keyboard, usually connected to the computer by a serial link.

Crushing the Blacks – The reduction of detail in the black regions of a film or video image by compressing the lower end of the contrast range.

CS (Carrier Suppression) – This is the result of an unwanted coherent signal added to the center carrier of the COFDM signal. It could be produced from the DC offset voltages or crosstalk.

CSA (Common Scrambling Algorithm) – Scrambling algorithm specified by DVB. The Common Scrambling Algorithm was designed to minimize the likelihood of piracy attack over a long period of time. By using the Common Scrambling Algorithm system in conjunction with the standard MPEG2 Transport Stream and selection mechanisms, it is possible to incorporate in a transmission the means to carry multiple messages which all enable control of the same scrambled broadcast but are generated by a number of Conditional Access Systems.

CSC (Computer Support Collaboration) – Describes computers that enhance productivity for people working in groups. Application examples include video conferencing, video mail, and shared workspaces.

CSDI – See Compressed Serial Digital Interface.

CSELT (Centro Studi e Laboratori Telecomunicazioni S.p.A.) – CSELT situated in Torino, Italy, is the research company owned by STET (Societa Finanziaria Telefonica per Azioni), the largest telecommunications company in Italy. CSELT has contributed to standards under ITU, ISO and ETSI and has participated in various research programs. In order to influence the production of standards, CSELT participates in groups such as DAVIC, the ATM Forum, and in the Network Management Forum.

CSG (Constructive Solid Geometry) – In CSG, solid objects are represented as Boolean combinations (union, intersection and difference) of solids.

CS-Mount – A newer standard for lens mounting. It uses the same physical thread as the C-mount, but the back flange-to-CCD distance is reduced to 12.5 mm in order to have the lenses made smaller, more compact and less expensive. CS-mount lenses can only be used on CS-mount cameras.

CSPS – See Constrained System Parameter Stream.

CSS (Content Scrambling System) – A type of digital copy protection sanctioned by the DVD forum.

CS-to-C-Mount Adaptor – An adaptor used to convert a CS-mount camera to C-mount to accommodate a C-mount lens. It looks like a ring 5 mm thick, with a male thread on one side and a female on the other, with 1" diameter and 32 threads/inch. It usually comes packaged with the newer type (CS-mount) of cameras.

CSV (Comma Separated Variables) – Commonly used no-frills text file format used for import from and import to spreadsheets and SQL databases.

CTA (Cordless Terminal Adapter) – Provides the interface between the subscriber line on a hook-up site and the DBS (Direct Broadcast Satellite). The CTA offers subscribers a range of services equivalent or better quality than a wired connection. The CTA offers the option of more advanced services, such as high-speed V.90 Internet access, and thus provide a supplementary income source.

Cue – a) An editing term meaning to bring all source and record VTRs to the predetermined edit point plus pre-roll time. **b)** An audio mixer function that allows the user to hear an audio source (usually through headphones) without selecting that source for broadcast/recording; the audio counterpart of a preview monitor. **c)** The act of rewinding and/or fast-forwarding a video- or audiotape so that the desired section is ready for play.

Cue Channel – A dedicated track for sync pulses or timecode.

Cue Control – A switch that temporarily disables a recorder's Tape Lifters during fast forward and rewind so the operator can judge what portion of the recording is passing the heads.

Cue Mark – Marks used to indicate frames of interest on a clip.

Cupping – Curvature of a tape in the lateral direction. Cupping may occur because of improper drying or curing of the coating or because of differences between the coefficients of thermal or hygroscopic expansion of coating and base film.

Curl – A defect of a photographic film consisting of unflatness in a plane cutting across the width of the film. Curl may result from improper drying conditions, and the direction and amount of curl may vary with the humidity of the air to which the film is exposed.

Current – The flow of electrons.

Current Tracer – Handheld troubleshooting tool used to detect current flow in logic circuits.

Current Working Directory – The directory within the file system in which you are currently located when you are working in a shell window.

Cursor – a) The small arrow on the screen that echoes the movements of the mouse. It changes shape depending on its location on the screen. **b)** An indicator on a screen that can be moved to highlight a particular function or control which is the current parameter now under adjustment or selected.

Curvature Error – A change in track shape that results in a bowed or S-shaped track. This becomes a problem if the playback head is not able to follow the track closely enough to capture the information.

Curve – A single continuous line with continuity of tangent vector and of curvature. It is defined by its type, degree, and rational feature.

Curves Graph – An X, Y graph that plots input color values on the horizontal axis and output color values on the vertical axis. Used in the Color Correction Tool as a control for changing the relationship between input and output color values.

Cusp – Breakpoints on curves.

Cut – a) The immediate switching from one video source to another during the vertical blanking interval. The visual effect is an abrupt change from one picture to another. **b)** The nearly instantaneous switch from one picture to another at the on-air output of the switcher. The switcher circuitry allows cuts only during the vertical interval of the video signal so as to prevent disruption of the picture. On the Vista, the Cut push-button in the Effects Transition control group activates an effects cut. The DSK Cut Key-In push-button cuts the downstream key on or off air. On AVCs, this is performed by a zero time auto transition.

Cut List – A series of output lists containing specifications used to conform the film work print or negative. See also Dupe List.

Cut-Off Frequency – That frequency beyond which no appreciable energy is transmitted. It may refer to either an upper or lower limit of a frequency band.

Cutout – See Matte.

Cuts Only – Transition limited to on/off or instantaneous transition-type edits; a basic editing process with limited capabilities.

Cutting – The selection and assembly of the various scenes or sequences of a reel of film.

Cutting Head – A transducer used to convert electrical signals into hills and valleys in the sides of record grooves.

CVBS (Color Video Blanking and Sync) – Another term for Composite Video.

CVBS (Composite Video Baseband Signal)

CVBS (Composite Video, Blanking, Synchronization)

CVBS (Composite Video Bar Signal) – In broadcast television, this refers to the video signal, including the color information and syncs.

CVC – See Compatible Video Consortium.

CVCT – See Cable Virtual Channel Table.

CW (Continuous Wave) – Refers to a separate subcarrier sine wave used for synchronization of the chrominance information.

CX Noise Reduction – 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 for the laserdisc to compensate for interference between the audio and video carriers. The original CX system for LP records was never implemented.

Cycle – An alternation of a waveform which begins at a point, passes through the zero line and ends at a point with the same value and moving in the same direction as the starting point.

Cycle Per Second – A measure of frequency, equivalent to Hertz.

Cycle Time – Total time required by a memory device to complete a read or write cycle and become available again.

Cyclic Redundancy Check (CRC) – a) Used to generate check information on blocks of data. Similar to a checksum, but is harder to generate and more reliable. **b)** Used in data transfer to check if the data has been corrupted. It is a check value calculated for a data stream by feeding it through a shifter with feedback terms "EXORed" back in. A CRC can detect errors but not repair them, unlike an ECC, which is attached to almost any burst of data that might possibly be corrupted. CRCs are used on disks, ITU-R 601 data, Ethernet packets, etc. **c)** Error detection using a parity check.

▶ D

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 non-compressed component digital video recording format that uses data conforming to the ITU-R BT.601-2 standard. Records on high end 19 mm (3/4") magnetic tape recorders. Systems manufactured by Sony and BTS. Most models can record 525, 625, ITU-R BT.601-2 and SMPTE 125M. The D1 designation is often used in-correctly to indicate component digital video.

D16 – A format to store film resolution images on D1 format tape recorders. Records one film frame in the space normally used for 16 video frames.

D2 – A non-compressed composite digital video record-ing format originally developed by Ampex that uses data conforming to SMPTE 244M and four 20 bit audio channels. Records on high end 19 mm (3/4") magnetic tape recorders. It uses the same tape cassette cartridge but the tape itself is metal particle tape like Beta SP and MII. The D2 designation is often used incorrectly to indicate composite digital video.

D2-MAC – Similar to D-MAC, the form preferred by manufacturers for European DBS. See also MAC.

D3 – A non-compressed composite digital video record-ing format that uses data conforming to SMPTE 244M and four 20 bit audio channels. Records on high end 1/2" magnetic tape similar to M-II. The format was developed by Matsushita and Panasonic.

D4 – A format designation never utilized due to the fact that the number four is considered unlucky (being synonymous with death in some Asian languages).

D5 – A non-compressed, 10 bit 270 Mbit/second, component or composite digital video recording format developed by Matsushita and Panasonic. It is compatible with 360 Mbit/second systems. It records on high end 1/2" magnetic tape recorders.

D6 – A digital tape format which uses a 19 mm helical-scan cassette tape to record uncompressed high definition television material at 1.88 GBps (1.2 Gbps).

D7 – DVCPRO. Panasonic's development of native DV component format.

D8 – There is no D8, nor will there be. The Television Recording and Reproduction Technology Committee of SMPTE decided to skip D8 because of the possibility of confusion with similarly named digital audio and data recorders.

D9 – Digital-S. A 1/2-inch digital tape format developed by JVC which uses a high-density metal particle tape running at 57.8 mm/s to record a video data rate of 50 Mbps.

DA-88 – A Tascam-brand eight track digital audio tape machine using the 8 mm video format of Sony. It has become the defacto 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 – See Digital Audio Broadcasting.

DAC (Digital-to-Analog Converter) – A device in which signals having a few (usually two) defined levels or states (digital) are converted into signals having a theoretically infinite number of states (analog).

DAC to DAC Skew – The difference in a full scale transition between R, B and B DAC outputs measured at the 50% transition point. Skew is measured in tenths of nanoseconds.

DAE (Digidesign Audio Engine) – A trademark of Avid Technology, Inc. The application that manages the AudioSuite plug-ins.

DAE (Digital Audio Extraction) – Reading digital audio data directly from a CD audio disc.

DAI (DMIF Application Interface) – The bridge between DMIF (delivery multimedia integration framework) and MPEG-4 systems.

Dailies – a) The first positive prints made by the laboratory from the negative photographed on the previous day. **b)** Film prints or video transfers of recently shot film material, prepared quickly so that production personnel can view and evaluate the previous day's shooting before proceeding. Also called Rushes, primarily in the United Kingdom.

Daisy Chain – Bus line that is interconnected with units so that the signal passes from one unit to the next in serial fashion.

DAM (DECT Authentication Module) – a) An IC card used for cordless telecommunications. **b)** A smart card that makes billing more secure and prevents fraud. The DAM is reminiscent of the subscriber identity module (SIM) card in the GSM standard.

Damped Oscillation – Oscillation which, because the driving force has been removed, gradually dies out, each swing being smaller than the preceding in smooth regular decay.

Dark Current – Leakage signal from a CCD sensor in the absence of incident light.

Dark Noise – Noise caused by the random (quantum) nature of the dark current.

DAT (Digital Audio Tape) – a) A consumer digital audio recording and playback system developed by Sony, with a signal quality capability surpassing that of the CD. b) A magnetic tape from which you can read and to which you can copy audio and digital information.

Data – General term denoting any or all facts, numbers, letters, and symbols or facts that refer to or describe an object, idea, condition, situation or other factors. Connotes basic elements of information that can be processed or produced by a computer. Sometimes data is considered to be expressible only in numerical form, but information is not so limited.

Data Acquisition – Collection of data from external sensors usually in analog form.

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

Data Base – Systematic organization of data files for easy access, retrieval, and updating.

Data Bus – Set of lines carrying data. The data bus is usually bidirectional and three-state.

Data Carousels – The data broadcast specification for data carousels supports data broadcast services that require the periodic transmission of data modules through DVB compliant broadcast networks. The modules are of known sizes and may be updated, added to, or removed from the data carousel in time. Modules can be clustered into a group of modules if required by the service. Likewise, groups can in turn be clustered into SuperGroups. Data broadcast according to the data carousel specification is transmitted in a DSM-CC data carousel which is defined in MPEG-2 DSM-CC. This specification defines additional structures and descriptors to be used in DV compliant networks. The method is such that no explicit references are made to PIDs and timing parameters enabling preparation of the content off-line.

Data Circuit-Terminating Equipment (DCE) – Equipment at a node or access point of a network that interfaces between the data terminal equipment (DTE) and the channel. For example, a modem.

Data Compression – Application of an algorithm to reduce the bit rate of a digital signal, or the bandwidth of an analog signal while preserving as much as possible of the information usually with the objective of meeting the constraints in subsequent portions of the system.

Data Conferencing – Sharing of computer data by remote participants by application sharing or shared white board technologies.

Data Domain – Analysis or display of signals in which only their digital value is considered and not their precise voltage or timing. A logic state analyzer displays information in the data domain.

Data Element – An item of data as represented before encoding and after decoding.

Data Encryption Standard (DES) – A national standard used in the U.S. for the encryption of digital information using keys. It provides privacy protection but not security protection.

Data Essence – a) Essence that is distinguished as different from video or audio essence. Digital data that may stand alone or may be associated with video or audio essence or metadata. **b)** Refers to the bits and bytes of new forms of content, such as interactive TV-specific content, Advanced Television Enhancement Forum (ATVEF) content (SMPTE 363M), closed captions.

Data Partitioning – A method for dividing a bit stream into two separate bit streams for error resilience purposes. The two bit streams have to be recombined before decoding.

Data Piping – The data broadcast specification profile for data pipes supports data broadcast services that require a simple, asynchronous, end-to-end delivery of data through DVB compliant broadcast networks. Data broadcast according to the data pipe specification is carried directly in the payloads of MPEG-2 TS packets.

Data Rate – The speed at which digital information is transmitted, typically expressed in hertz (Hz), bits/second (b/s), or bytes/sec (B/s). The higher the data rate of your video capture, the lower the compression and the higher the video quality. The higher the data rate, the faster your hard drives must be. Also called throughput.

Data Reduction – The process of reducing the number of recorded or transmitted digital data samples through the exclusion of redundant or unessential samples. Also referred to as Data Compression.

Data Search Information (DSI) – These packets are part of the 1.00 Mbit/sec overhead in video applications. These packets contain navigation information for searching and seamless playback of the Video Object Unit (VOBU). The most important field in this packet is the sector address. This shows where the first reference frame of the video object begins. Advanced angle change and presentation timing are included to assist seamless playback. They are removed before entering the MPEG systems buffer, also known as the System Target Decoder (STD).

Data Set – A group of two or more data essence or metadata elements that are pre-defined in the relevant data essence standard or Dynamic Metadata Dictionary and are grouped together under one UL Data Key. Set members are not guaranteed to exist or be in any order.

Data Streaming – The data broadcast, specification profile for data streaming supports data broadcast services that require a streaming-oriented, end-to-end delivery of data in either an asynchronous, synchronous or synchronized way through DVB compliant broadcast networks. Data broadcast according to the data streaming specification is carried in Program Elementary Stream (PES) packets which are defined in MPEG-2 systems. See Asynchronous Data Streaming, Synchronous Data Streaming.

Data Terminal Equipment (DTE) – A device that controls data flowing to or from a computer. The term is most often used in reference to serial communications defined by the RS-232C standard.

Datacasting – Digital television allows for the transmission of not only digital sound and images, but also digital data (text, graphics, maps, services, etc.). This aspect of DTV is the least developed; but in the near future, applications will likely include interactive program guides, sports statistics, stock quotes, retail ordering information, and the like. Datacasting is not two-way, although most industry experts expect that set-top box manufacturers will create methods for interaction. By integrating dial-up Internet connections with the technology, simple responses will be possible using a modem and either an add-on keyboard or the set-tops remote control.

DATV (Digitally Assisted Television) – An ATV scheme first proposed in Britain.

DAVIC (Digital Audio Visual Council) – Facing a need to make a multitude of audio/visual technologies and network protocols interoperate, DAVIC was formed in 1993 by Dr. Leonardo Chiariglione, convenor of the MPEG. The purpose of DAVIC is to provide specifications of open interfaces and protocols to maximize interoperability in digital audio/visual applications and services. Thus, DAVIC operates as an extension of technology development centers, such as MPEG.

dB (Decibel) – a) dB is a standard unit for expressing changes in relative power. Variations of this formula describe power changes in terms of voltage or current. dB = 10log10 (P1/P2). **b)** A logarithmic ratio of two signals or values, usually refers to power, but also voltage and current. When power is calculated the logarithm is multiplied by 10, while for current and voltage by 20.

dBFS (Decibel Full Scale)

dBm – dBm is a special case of dB where P2 in the dB formula is equal to 1 mW. See dB.

DBN – See Data Block Number.

DBS – See Direct Broadcast Satellite.

dBw – Refer to the definition of dB. dBw is a special case of dB where P2 in the dB formula is equal to 1 watt.

DC Coefficient – The DCT coefficient for which the frequency is zero in both dimensions.

DC Coupled – A connection configured so that both the signal (AC component) and the constant voltage on which it is riding (DC component) are passed through.

DC Erasure – See Erasure.

DC Noise – The noise arising when reproducing a tape which has been non-uniformly magnetized by energizing the record head with DC, either in the presence or absence of bias. This noise has pronounced long wavelength components which can be as much as 20 dB higher than those obtained from a bulk erased tape. At very high values of DC, the DC noise approaches the saturation noise.

DC Restoration – The correct blanking level for a video signal is zero volts. When a video signal is AC-coupled between stages, it loses its DC reference. A DC restoration circuit clamps the blanking at a fixed level. If set properly, this level is zero volts.

DC Restore – DC restore is the process in which a video waveform has its sync tips or backporch set to some known DC voltage level after it has been AC coupled.

DC Restorer – A circuit used in picture monitors and waveform monitors to clamp one point of the waveform to a fixed DC level.

DC Servo Motor – A motor, the speed of which is determined by the DC voltage applied to it and has provision for sensing its own speed and applying correcting voltages to keep it running at a certain speed.

DC30 Editing Mode – An edit mode in Premiere – specifically for DC30 users – that allows video to be streamed out of the DC30 capture card installed in a computer running Windows.

DCAM (Digital Camera) – Captures images (still or motion) digitally and does not require analog-to-digital conversion before the image can be transmitted or stored in a computer. The analog-to-digital conversion process (which takes place in CODECs) usually causes some degradation of the image, and a time delay in transmission. Avoiding this step theoretically provides a better, faster image at the receiving end.

DCC (Digital Compact Cassette) – A consumer format from Philips using PASC audio coding.

DCE (Data Communication Equipment) – Devices and connections of a communications network that comprise the network end of the user-to-network interface. The DCE provides a physical connection to the network, forwards traffic, and provides a clocking signal used to synchronize data transmission between DCE and DTE devices. Modems and interface cards are examples of DCE.

DCI (Display Control Interface) – A software layer that provides direct control of the display system to an application or client. The display vendor provides information to the system (in addition to the display driver) that allows DCI to offer a generic interface to a client.

DCT – See Discrete Cosine Transform.

DCT Coefficient – The amplitude of a specific cosine basis function.

DCT Recording Format – Proprietary recording format developed by Ampex that uses a 19 mm (3/4") recording cassette. Records ITU-R BT.601-2 and SMPTE 125M data with a 2:1 compression.

DCT-1/IDCT (Inverse Discrete Cosine Transform) – A step in the MPEG decoding process to convert data from temporal back to spatial domain.

DD (Direct Draw) – A Windows 95 version of DCI. See DCI.

DD2 – Data recorders that have been developed using D2 tape offer relatively vast storage of image or other data. Various data transfer rates are available for different computer interfaces. Other computer storage media editing is difficult and images are not directly viewable.

DDB (Download Data Block)

DDC (Data Download Control)

DDC2B – A serial control interface standard used to operate control registers in picture monitors and video chips. The two-wire system is defined by data and clock signals.

DDP (Disc Description Protocol) – A file or group of files which describe how to master a data image file for optical disc (DVD or CD). This is an ANSI industry standard developed by Doug Carson and Associates. The laser beam recorders use this information in the mastering process.

DDR (Digital Disk Recorder) – See Digital Disk Recorder.

DDS (Digital Data Service) – The class of service offered by telecommunications companies for transmitting digital data as opposed to voice.

Debouncing – Elimination of the bounce signals characteristic of mechanical switches. Debouncing can be performed by either hardware or software.

Debugger – A program designed to facilitate software debugging. In general, it provides breakpoints, dump facilities, and the ability to examine and modify registers and memory.

Decay – a) The length of time it takes for an audio signal to fall below the noise threshold. **b)** The adjustable length of time it takes for an ADO DigiTrail effect to complete. (The trail catches up with the primary video.)

Decay Time – The time it takes for a signal to decrease to one-millionth of its original value (60 dB down from its original level).

Decibel – One-tenth of a Bel. It is a relative measure of signal or sound intensity or "volume". It expresses the ratio of one intensity to another. One dB is about the smallest change in sound volume that the human ear can detect. (Can also express voltage and power ratios logarithmically.) Used to define the ratio of two powers, voltages, or currents. See the definitions of dB, dBm and dBw.

Decimation – Term used to describe the process by which an image file is reduced by throwing away sampled points. If an image array consisted of 100 samples on the X axis and 100 samples on the Y axis, and every other sample where thrown away, the image file is decimated by a factor of 2 and the size of the file is reduced by 1/4. If only one sample out of every four is saved, the decimation factor is 4 and the file size is 1/16 of the original. Decimation is a low cost way of compressing video files and is found in many low cost systems. Decimation however introduces many artifacts that are unacceptable in higher cost systems.

Decimation Filter – The Decimation Filter is designed to provide decimation without the severe artifacts associated with throwing data away although artifacts still exist. (See the definition of Decimation.) The Decimation Filter process still throws data away but reduces image artifacts by smoothing out the voltage steps between sampled points.

Deck Controller – A tool that allows the user to control a deck using standard functions such as shuttle, play, fast forward, rewind, stop and eject.

Deck, Tape – A tape recorder that does not include power amplifiers or speakers.

Decode – a) To separate a composite video signal into its component parts. **b)** To reconstruct information (data) by performing the inverse (reverse) functions of the encode process.

Decoded Audiovisual Object – See Decompressed Audiovisual Objects.

Decoded Representation – The intermediate representation of AV objects that is output from decoding and input to compositing. It is independent of the particular formats used for transmitting or presenting this same data. It is suitable for processing or compositing without the need to revert to a presentable format (such as bit map).

Decoded Stream – The decoded reconstruction of a compressed bit stream.

Decoder – a) Device used to recover the component signals from a composite (encoded) source. Decoders are used in displays and in various processing hardware where components signals are required from a composite source such as composite chroma keying or color correction equipment. **b)** Device that changes NTSC signals into component signals; sometimes devices that change digital signals to analog (see DAC). All color TV sets must include an NTSC decoder. Because sets are so inexpensive, such decoders are often quite rudimentary. **c)** An embodiment of a decoding process.

Decoder Buffer (DB) – A buffer at the input of a media object decoder that contains access units.

Decoder Configuration – The configuration of a media object decoder for processing its elementary stream data by using information contained in its elementary stream descriptor.

Decoder Input Buffer – The first-in first-out (FIFO) buffer specified in the video buffering verifier.

Decoder Input Rate – The data rate specified in the video buffering verifier and encoded in the coded video bit stream.

Decoding (Process) – a) The process that reads an input coded bit stream and produces decoded pictures or audio samples. **b)** Converting semantic entities related to coded representation of individual audiovisual objects into their decoded representation. Decoding is performed by calling the public method decode of the audiovisual object.

Decoding Buffer (DB) – A buffer at the input of a media object decoder that contains access units.

Decoding Layer – The MPEG-4 Systems Layer that encompass the Syntactic Decoding Layer and the Decompression Layer and performs the Decoding Process.

Decoding Script – The description of the decoding procedure (including calls to specific decoding tools).

Decoding Time Stamp (DTS) – A field that may be present in a PES packet header that indicates the time that an access unit is decoded in the system target decoder.

Decompose – To create new, shorter master clips based on only the material you have edited and included in your sequence.

Decompress – The process of converting video and audio data from its compact form back into its original form in order to play it. Compare Compress.

Decompressed Audiovisual Object (Decompressed AV Object) – The representation of the audiovisual object that is optimized for the needs of the Composition Layer and the Rendering Layer as is goes out of the Decompression Layer.

Decompression Layer – The MPEG-4 Systems Layer that converts semantic entities from Syntactic Decoded Audiovisual Objects into their decompressed representation (Decompressed Audiovisual Objects).

Decrement – Programming instruction that decreases the contents of a storage location.

Decryption – The process of unscrambling signals for reception and playback by authorized parties. The reverse process of encryption.

DECT (Digital Enhanced Cordless Telecommunications) – A cordless phone standard widely used in Europe. Based on TDMA and the 1.8 and 1.9 GHz bands, it uses Dynamic Channel Selection/Dynamic Channel Allocation (DCS/DCA) to enable multiple DECT users to coexist on the same frequency. DECT provides data links up to 522 kbps with 2 Mbps expected in the future. Using dual-mode handsets, DECT is expected to coexist with GSM, which is the standard cell phone system in Europe.

Dedicated – Set apart for some special use. A dedicated microprocessor is one that has been specially programmed for a single application such as weight measurement, traffic light control, etc. ROMs by their very nature are dedicated memories.

Dedicated Keyboard – A keyboard assigned to a specific purpose.

Deemphasis – Also known as postemphasis and post-equalization. Deemphasis modifies the frequency-response characteristic of the signal in a way that is complementary to that introduced by preemphasis.

Deemphasis Network – Circuit that restores the preemphasized frequency response to its original levels.

Deesser – A compressor which reduces sibilance by triggering compression when it senses the presence of high frequency signals above the compression threshold.

Default – The setup condition (for example, transition rate settings, color of the matte gens, push-button status) existing when a device is first powered-up, before you make any changes.

Default Printer – The printer to which the system directs a print request if you do not specify a printer when you make the request. You set the default printer using the Print Manager.

Defaults – A set of behaviors specified on every system. You can later change these specifications which range from how your screen looks to what type of drive you want to use to install new software.

Defect – For tape, an imperfection in the tape leading to a variation in output or a dropout. The most common defects take the form of surface projections, consisting of oxide agglomerates, imbedded foreign matter, or redeposited wear products.

Definition – The aggregate of fine details available on-screen. The higher the image definition, the greater the number of details that can be discerned. During video recording and subsequent playback, several factors can conspire to cause a loss of definition. Among these are the limited frequency response of magnetic tapes and signal losses associated with electronic circuitry employed in the recording process. These losses occur because fine details appear in the highest frequency region of a video signal and this portion is usually the first casualty of signal degradation. Each additional generation of a videotape results in fewer and fewer fine details as losses are accumulated.

Degauss – To demagnetize (erase) all recorded material on a magnetic videotape, an audiotape or the screen of a color monitor.

Degaussing – A process by which a unidirectional magnetic field is removed from such transport parts as heads and guides. The presence of such a field causes noise and a loss of high frequencies.

Degenerate – Being simpler mathematically than the typical case. A degenerate edge is reduced to one point. A degenerate polygon has a null surface.

Degree – An indication of the complexity of a curve.

Deinterlace – Separation of field 1 and field 2 in a source clip, producing a new clip twice as long as the original.

Del Ray Group – Proponent of the HD-NTSC ATV scheme.

Delay – a) The time required for a signal to pass through a device or conductor. **b)** The time it takes for any circuitry or equipment to process a signal when referenced to the input or some fixed reference (i.e., house sync). Common usage is total delay through a switcher or encoder. **c)** The amount of time between input of the first pixel of a particular picture by the encoder and the time it exits the decoder, excluding the actual time in the communication channel. It is the combined processing time of the encoder and decoder. For face-to-face or interactive applications, the delay is crucial. It usually is required to be less than 200 milliseconds for one-way communication.

Delay Correction – When an electronic signal travels through electronic circuitry or even through long coaxial cable runs, delay problems may occur. This is manifested as a displaced image and special electronic circuitry is needed to correct it.

Delay Distortion – Distortion resulting from non-uniform speed of transmission of the various frequency components of a signal; i.e., the various frequency components of the signal have different times of travel (delay) between the input and the output of a circuit.

Delay Distribution Amplifier – An amplifier that can introduce adjustable delay in a video signal path.

Delay Line – An artificial or real transmission line or equivalent device designed to delay a wave or signal for a specific length of time.

Delete – Edit term to remove.

Delivery – Getting television signals to a viewer. Delivery might be physical (e.g., cassette or disc) or electronic (e.g., broadcast, CATV, DBS, optical fiber).

Delivery System – The physical medium by which one or more multiplexes are transmitted, e.g., satellite system, wideband coaxial cable, fiber optics, terrestrial channel of one emitting point.

Delta Frame – Contains only the data that has changed since the last frame. Delta frames are an efficient means of compressing image data. Compare Key Frame.

Demodulation – The process of recovering the intelligence from a modulated carrier.

Demodulator – a) A device which recovers the original signal after it has been modulated with a high frequency carrier. In television, it may refer to an instrument which takes video in its transmitted form (modulated picture carrier) and converts it to baseband; the circuits which recover R-Y and B-Y from the composite signal. **b)** A device that strips the video and audio signals from the carrier frequency.

Demultiplexer (Demux) – A device used to separate two or more signals that were previously combined by a compatible multiplexer and transmitted over a single channel.

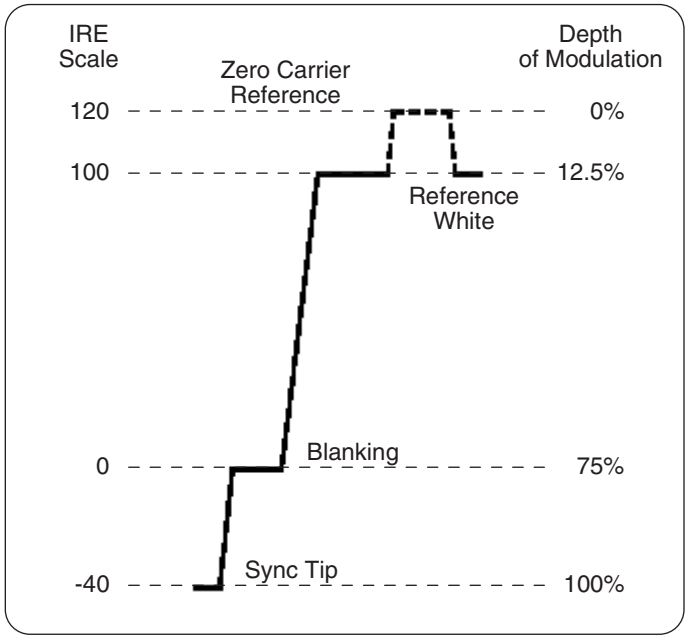
Demultiplexing – Separating elementary streams or individual channels of data from a single multi-channel stream. For example, video and audio streams must be demultiplexed before they are decoded. This is true for multiplexed digital television transmissions.

Density – a) The degree of darkness of an image. **b)** The percent of screen used in an image. c) The negative logarithm to the base ten of the transmittance (or reflectance) of the sample. A sample which transmits 1/2 of the incident light has a transmittance of 0.50 or 50% and a density of 0.30.

Depth Cueing – Varies the intensity of shaded surfaces as a function of distance from the eye.

Depth of Field – a) The range of objects in front of a camera lens which are in focus. Smaller F-stops provide greater depth of field, i.e., more of the scene, near to far, will be in focus. **b)** The area in front of and behind the object in focus that appears sharp on the screen. The depth of field increases with the decrease of the focal length, i.e., the shorter the focal length the wider the depth of field. The depth of field is always wider behind the objects in focus.

Depth of Modulation – This measurement indicates whether or not video signal levels are properly represented in the RF signal. The NTSC modulation scheme yields an RF signal that reaches its maximum peak-to-peak amplitude at sync tip (100%). In a properly adjusted signal, blanking level corresponds to 75%, and peak white to 12.5%. The zero carrier reference level corresponds to 0%. Over modulation often shows up in the picture as a nonlinear distortion such as differential phase or differential gain. Incidental Carrier Phase Modulation (ICPM) or white clipping may also result. Under modulation often result in degraded signal-to-noise performance.



Depth Shadow – A shadow that extends solidly from the edges of a title or shape to make it appear three-dimensional. See also Drop Shadow.

Dequantization – The process of rescaling the quantized discrete cosine transform coefficients after their representation in the bit stream has been decoded and before they are presented to the inverse DCT.

Descrambler – Electronic circuit that restores a scrambled video signal to its original form. Television signals – especially those transmitted by satellite – are often scrambled to protect against theft and other unauthorized use.

Description – Consists of a description scheme (structure) and a set of descriptor values (instantiations) that describe the data.

Description Definition Language (DDL) – A language that allows the creation of new description schemes and, possibly, descriptors. It also allows the extension and modification of existing description schemes.

Description Scheme (DS) – Specifies the structure and semantics of the relationships between its components, which may be both descriptors and description schemes.

Descriptor (D) – a) MPEG systems data structures that carry descriptive and relational information about the program(s) and their Packetized Elementary Streams (PES). **b)** A representation of a feature, a descriptor defines the syntax and the semantics of the feature representation. **c)** A data structure that is used to describe particular aspects of an elementary stream or a coded media object.

Descriptor Value – An instantiation of a descriptor for a given data set (or subset thereof).

Deserializer – A device that converts serial digital information to parallel.

Desk Top Video (DTV) – a) Use of a desktop computer for video production. **b)** Self-contained computer and display with integrated video and optional network interface for local and remote work and information access.

Detail – Refers to the most minute elements in a picture which are distinct and recognizable. Similar to Definition or Resolution.

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

Development System – Microcomputer system with all the facilities required for hardware and software development for a given microprocessor. Generally consists of a microcomputer system, CRT display, printer, mass storage (usually dual floppy-disk drivers), PROM programmer, and in-circuit emulator.

Device Driver – Software to enable a computer to access or control a peripheral device, such as a printer.

Device Interface – A conversion device that separates the RGB and sync signals to display computer graphics on a video monitor.

DFD (Displaced Frame Difference) – Differential picture if there is motion.

D-Frame – Frame coded according to an MPEG-1 mode which uses DC coefficients only.

DHEI (DigiCable Headend Expansion Interface) – The DigiCable Headend Expansion Interface (DHEI) is intended for the transport of MPEG-2 system multiplexes between pieces of equipment in the headend. It originally was a proprietary interface of General Instrument, but now has been standardized by the SCTE (Society of Cable Telecommunications Engineers) for use in the cable industry.

Diagnostics – A series of tests that check hardware components of a system.

Diagonal Resolution – Amount of detail that can be perceived in a diagonal direction. Although diagonal resolution is a consequence of horizontal and vertical resolution, it is not automatically equivalent to them. In fact, ordinary television systems usually provide about 40 percent more diagonal

resolution than horizontal or vertical. Many ATV schemes intentionally sacrifice diagonal resolution in favor of some other characteristics (such as improved horizontal or vertical resolution) on the theory that human vision is less sensitive to diagonal resolution than to horizontal or vertical. There is some evidence that diagonal resolution could be reduced to about 40 percent less than either horizontal or vertical (overall half of its NTSC value) with no perceptible impairment. See also Resolution.

Diagonal Split – An unusual quad split feature found on Ampex switchers, allowing diagonal or X shaped divisions between sources, as opposed to the traditional horizontal and vertical divisions.

Dialog Normalization Value – The dialog normalization value is a Dolby Digital parameter that describes the long-term average dialog level of the associated program. It may also describe the long-term average level of programs that do not contain dialog, such as music. This level is specified on an absolute scale ranging from -1 dBFS to -31 dBFS. Dolby Digital decoders attenuate programs based on the dialog normalization value in order to achieve uniform playback level.

DIB (Device Independent Bitmap) – A file format that represents bitmap images in a device-independent manner. Bitmaps can be represented at 1, 4 and 8 bits-per-pixel with a palette containing colors representing 24 bits. Bitmaps can also be represented at 24 bits-per-pixel without a palette in a run-length encoded format.

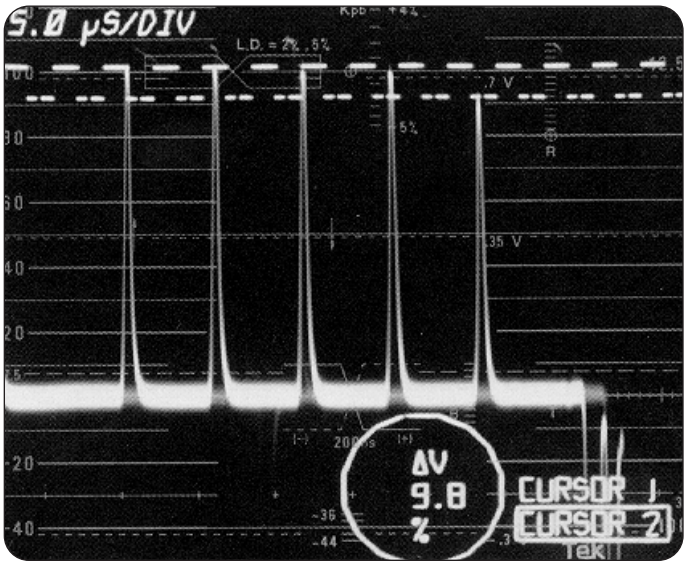
Dielectric – An insulating (nonconductive) material.

Differential Gain – a) A nonlinear distortion often referred to as "diff gain" or "dG". It is present if a signal's chrominance gain is affected by luma levels. This amplitude distortion is a result of the system's inability to uniformly process the high frequency chrominance signals at all luma levels. The amount of differential gain distortion is expressed in percent. Since both attenuation and peaking of chrominance can occur in the same signal, it is important to specify whether the maximum over all amplitude difference or the maximum deviation from the blanking level amplitude is being quoted. In general, NTSC measurement standard define differential gain as the largest amplitude deviation between any two levels, expressed as a percent of the largest chrominance amplitude. When differential gain is present, color saturation has an unwarranted dependence on luminance level. Color saturation is often improperly reproduced at high luminance levels. The Modulated Ramp or Modulated Stair Step signals can be used to test for differential gain. **b)** The amplitude change, usually of the 3.6 MHz color subcarrier, introduced by the overall circuit, measured in dB or percent, as the subcarrier is varied from blanking to white level.

Differential Phase – a) A nonlinear distortion often referred to as "diff phase" or "dP". It is present if a signal's chrominance phase is affected by the luminance level. It occurs because of the system's inability to uniformly process the high frequency chrominance information at all luminance levels. Diff phase is expressed in degrees of subcarrier phase. The subcarrier phase can be distorted such that the subcarrier phase is advanced (lead or positive) or delayed (lag or negative) in relation to its original position. In fact, over the period of a video line, the subcarrier phase can be both advanced and delayed. For this reason it is important to specify whether "peak to peak diff phase" is being specified or "maximum deviation from 0" in one direction or another. Normally the "peak to peak diff phase" is given. dP distortions cause changes in hue when picture brightness changes. Colors may not be properly reproduced, particularly in high-luminance areas of the picture. **b)** The phase change of the 3.6 MHz color subcarrier introduced by the overall circuit, measured in degrees, as the subcarrier is varied from blanking to white level.

Differential Pulse Code Modulation – DPCM is a source coding scheme that was developed for encoding sources with memory. The reason for using the DPCM structure is that for most sources of practical interest, the variance of the prediction error is substantially smaller than that of the source.

Differentiated Step Filter – A special "diff step" filter is used to measure luminance nonlinearity. When this filter is used with a luminance step waveform each step on the waveform is translated into a spike that is displayed on the waveform monitor. The height of each spike translates into the height of the step so the amount of distortion can be determined by comparing the height of each spike. Refer to the figure below.



Diffuse – a) Diffuse light is the light reflected by a matte surface; without glare or highlight. It is based on relative orientation of surface normal and light source positions and luminance. **b)** Widely spread or scattered. Used to define lighting that reflects equally in all directions producing a matte, or flat, reflection on an object. The reflection intensity depends on the light source relative to the surface of the object.

DigiCipher® – DigiCipher is a compression and transmission technology from General Instrument (now Motorola), dedicated to Digital TV distribution via satellite. DigiCipher video coding is based on DCT like MPEG, but does not use B-pictures. Instead, it uses a so-called adaptive prediction mode. DigiCipher 1 was the first incarnation and is still used today by many providers since it was the first commercially available digital compression scheme.

DigiCipher® II – This is General Instrument's (now Motorola) latest distribution system and is the standard for 4DTV product. DCII uses standard MPEG-2 video encoding, but just about everything else in this "standard" is unique to DCII. For example, DVB/MPEG-2 uses Musicam for audio where-

as DCII uses Dolby AC-3. Despite using the same video standard, DVB/MPEG-2 and DCII signals are totally incompatible and no receiver can currently receive both.

Digiloop – Patented circuitry within the Vista switcher, which allows the insertion of a digital effects device within the architecture of the switcher. This allows multi-channels of digital effects to be utilized on a single M/E, which would otherwise require 3 M/Es.

Digimatte (Menu) – The key channel processor, providing a separate channel specifically for black and white key signals that processes and manipulates an external key signal in the same way as source video in 3D space.

Digit – Sign or symbol used to convey a specific quantity of information either by itself or with other numbers of its set: 2, 3, 4, and 5 are digits. The base or radix must be specified and each digit's value assigned.

DigiTAG (Digital Television Action Group)

Digital – a) Having discrete states. Most digital logic is binary, with two states (on or off). **b)** A discontinuous electrical signal that carries information in binary fashion. Data is represented by a specific sequence of off-on electrical pulses. A method of representing data using binary numbers. An analog signal is converted to digital by the use of an analog-to-digital (A/D) converter chip by taking samples of the signal at a fixed time interval (sampling frequency). Assigning a binary number to these samples, this digital stream is then recorded onto magnetic tape. Upon playback, a digital-to-analog (D/A) converter chip reads the binary data and reconstructs the original analog signal. This process virtually eliminates generation loss as every digital-to-digital copy is theoretically an exact duplicate of the original allowing multi-generational dubs to be made without degradation. In actuality of course, digital systems are not perfect and specialized hardware/software is used to correct all but the most severe data loss. Digital signals are virtually immune to noise, distortion, crosstalk, and other quality problems. In addition, digitally based equipment often offers advantages in cost, features, performance and reliability when compared to analog equipment.

Digital 8 – 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. On playback, analog tapes are converted to a 25 Mbps compressed signal available via the iLink digital output interface. Playback from analog tapes has limited video quality. New recordings are digital and identical in performance to DV; audio specs and other data also are the same.

Digital Audio – Audio that has been encoded in a digital form for processing, storage or transmission.

Digital Audio Broadcasting (DAB) – a) NRSC (National Radio Systems Committee) term for the next generation of digital radio equipment. **b)** Modulations for sending digital rather than analog audio signals by either terrestrial or satellite transmitter with audio response up to compact disc quality (20 kHz). c) DAB was started as EUREKA project EU 147 in 1986. The digital audio coding process called MUSICAM was designed within EUREKA 147 by CCETT. The MUSICAM technique was selected by MPEG as the basis of the MPEG-1 audio coding, and it is the MPEG-1 Layer II algorithm which will be used in the DAB system. The EUREKA 147 project, in close cooperation with EBU, introduced the DAB system approach to the ITU-R, which subsequently has been contributing actively for the worldwide recognition and standardization of the DAB system. EBU, ETSI and EUREKA 147 set up a joint task committee with the purpose of defining a European Telecommunications Standard (ETS) for digital sound broadcasting, based on the DAB specifications. ETSI published the EUREKA 147 system as standard ETS 300 401 in February 1995, and market adoption is forthcoming; the BBC, for instance, plans to have 50% transmission coverage in 1997 when DAB receivers are being introduced to the public.

Digital Audio Clipping – Occurs when the audio sample data is 0 dBFS for a number of consecutive samples. When this happens, an indicator will be displayed in the level display for a period of time set by the user.

Digital Audio Recording – A system which converts audio signals into digital words which are stored on magnetic tape for later reconversion to audio, in such a manner that dropouts, noise, distortion and other poor tape qualities are eliminated.

Digital Betacam – A development of the original analog Betacam VTR which records digitally on a Betacam-style cassette. A digital video tape format using the CCIR 601 standard to record 4:2:2 component video in compressed form on 12.5 mm (1/2") tape.

Digital Borderline – A GVG option and term. A digital border type with fewer settings, hence less control than the analog type used on Ampex switchers.

Digital Cable – A service provided by many cable providers which offers viewers more channels, access to pay-per-view programs and online guides. Digital cable is not the same as HDTV or DTV; rather, digital cable simply offers cable subscribers the options for paying for additional services.

Digital Chroma Keying – Digital chroma keying 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 chroma keyer 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 Cinemas – Facing the high costs of copying, handling and distribution of film, an infrastructure enabling digital transport of movies to digital cinemas could be highly attractive. In addition, digital delivery of films can effectively curb piracy. The MPEG-2 syntax supports the levels of quality and features needed for this application.

Digital Component – Component signals in which the values for each pixel are represented by a set of numbers.

Digital Component Video – Digital video using separate color components, such as YCbCr or RGB. See ITU-R BT.601-2. Sometimes incorrectly referred to as D1.

Digital Composite Video – The digitized waveform of (M) NTSC or (B, D, G, H, I) PAL video signals, with specific digital values assigned to the sync, blank, and white levels. Sometimes incorrectly referred to as D2 or D3.

Digital Compression – A process that reduces storage space and/or transmission data rate necessary to store or transmit information that is represented in a digital format.

Digital Cut – The output of a sequence, which is usually recorded to tape.

Digital Disk Recorder (DDR) – a) 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. **b)** A video recording device that uses a hard disk or optical disk drive mechanism. Disk recorders offer quick access to recorded material.

Digital Effects – Special effects created using a digital video effects (DVE) unit.

Digital Moving Picture (dpx) – This is the SMPTE standard file format of the Digital Moving Picture Exchange Kodak Cineon raster file format.

Digital Parallel Distribution Amplifier – A distribution amplifier designed to amplify and fan-out parallel digital signals.

Digital Recording – A method of recording in which the information (usually audio or video) is first coded in a digital form. Most commonly, a binary code is used and recoding takes place in terms of two discrete values of residual flux.

Digital Rights Management (DRM) – A generic term for a number of capabilities that allow a content producer or distributor to determine under what conditions their product can be acquired, stored, viewed, copied, loaned, etc. Popular proprietary solutions include InterTrust, etc.

Digital S – A digital tape format that uses 1.25-inch high-density metal particle tape, running at 57.8 mm/s, to record a video data rate of 50 Mbps. Video sampled at 4:2:2 is compressed at 3:3:1 using DCT-based intra-frame compression. Two individually editable audio channels are recorded using 16-bit, 48 kHz sampling. The tape can be shuttled and searched up to x32 speed. Digital S includes two cue tracks and four further audio channels in a cassette housing with the same dimensions as VHS.

Digital Sampling Rate – This is the frequency at which an analog signal is sampled to create a digital signal.

Digital Signal – An electronic signal where every different value from the real-life excitation (sound, light) has a different value of binary combinations (words) that represent the analog signal.

Digital Simultaneous Voice and Data (DSVD) – DSVD is a method for combining digital voice and data packets for transmission over an analog phone line.

Digital Storage Media (DSM) – a) A means of storage (usually magnetic tape, disk or DVD) for audio, video or other information, that is in binary form. **b)** A digital storage or transmission device or system.

Digital Storage Media, Command and Control (DSM-CC) – DSM-CC is part 6 of ISO/IEC 12818 MPEG-2 standard. It specifies open interfaces and protocols for delivery of multimedia broadband services and is transport-layer independent.

Digital System – A system utilizing devices that can be in only one of two possible states.

Digital Television Communications System (DITEC) – System developed by Comstat Corp. for satellite links.

Digital Transmission Content Protection (DTCP) – An encryption method (also known as 5D) developed by Sony, Hitachi, Intel, Matsushita and Toshiba for IEEE 1394 interfaces.

Digital Tuner, Digital Receiver – A digital tuner serves as the decoder required to receive and display digital broadcasts. A digital tuner can down-convert broadcasts for an analog TV or provide a digital signal to a digital television. It can be included inside TV sets or via a set-top box.

Digital TV Group – This is a UK forum of technology and service providers created in August 1995 with the objective to speed up the introduction of digital terrestrial TV in the UK. With its focus on implementation aspects, the efforts of the group are seen as an extension of the work done in DVB. Membership is open to those DVB members who wish to participate actively in the introduction of digital terrestrial TV in the UK.

Digital Versatile Disk (DVD) – The modern proposals for DVD are the result of two former optical disc formats, supporting the MMCD (Multimedia CD) and the SD (Super Density) formats. The two groups agreed on a third format. The DVD, initially, addressed only movie player applications, but today's DVD is positioned as a high-capacity multimedia storage medium. The DVD consortium addresses topics such as video, ROM, audio-only, and copy protection. The movie player remains the DVD's prime application, but the DVD is taking an increasingly large share of the CD-ROM market. The promoters of the format agreed in December 1995 on a core set of specifications. The system operates at an average data rate of 4.69 Mbit/s and features 4.7 GB data capacity, which allows MPEG-2 coding of movies, or which may be utilized for a high-resolution music disc. For the PAL and NTSC specifications of the DVD, different audio coding has been chosen to obey market patterns. For the NTSC version, the Dolby AC-3 coding will be mandatory, with MPEG audio as an option, whereas the opposite is true for PAL and SECAM markets.

Digital Vertical Interval Timecode (DVITC) – DVITC digitizes the analog VITC waveform to generate 8-bit values. This allows the VITC to be used with digital video systems. For 525-line video systems, it is defined by SMPTE 266M. BT.1366 defines how to transfer VITC and LTC as ancillary data in digital component interfaces.

Digital Video (DV) – A video signal represented by computer-readable binary numbers that describe colors and brightness levels.

Digital Video Broadcasting (DVB) – a) A system developed in Europe for digital television transmission, originally for standard definition only, though high-definition modes have now been added to the specification. DVB defines a complete system for terrestrial, satellite, and cable transmission. Like the ATSC system, DVB uses MPEG-2 compression for video, but it uses MPEG audio compression and COFDM modulation for terrestrial transmission. b) At the end of 1991, the European Launching Group (ELG) was formed to spearhead the development of digital TV in Europe. During 1993, a Memorandum of Understanding was drafted and signed by the ELG participants, which now included manufacturers, regulatory bodies and other interest groups. At the same time, the ELG became Digital Video Broadcasting (DVB). The TV system provided by the DVB is based on MPEG-2 audio and video coding, and DVB has added various elements not

included in the MPEG specification, such as modulation, scrambling and information systems. The specifications from DVB are offered to either ETSI or CENELEC for standardization, and to the ITU.

Digital Video Cassette (DVC) – a) Tape width is 1/4", metal particle formula. The source and reconstructed video sample rate is similar to that of CCIR-601, but with additional chrominance subsampling (4:1:1 in the case of 30 Hz and 4:2:0 in the case of 25 Hz mode). For 30 frames/sec, the active source rate is 720 pixels/lines x 480 lines/frame x 30 frames/sec x 1.5 samples/pixel average x 8 samples/pixel = ~124 Mbit/sec. A JPEG-like still image compression algorithm (with macroblock adaptive quantization) applied with a 5:1 reduction ratio (target bit rate of 25 Mbit/sec) averaged over a period of roughly 100 microseconds (100 microseconds is pretty small compared to MPEG's typical 1/4 second time average!) **b)** A digital tape recording format using approximately 5:1 compression to produce near-Betacam quality on a very small cassette. Originated as a consumer product, but being used professionally as exemplified by Panasonic's variation, DVC-Pro.

Digital Video Cassette Recorder (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 Disc – See DVD.

Digital Video Express (DIVX) – A short-lived pay-per-viewing-period variation of DVD.

Digital Video Interactive (DVI) – A multimedia system being marketed by Intel. DVI is not just an image-compression scheme, but includes everything that is necessary to implement a multimedia playback station. including chips, boards, and software. DVI technology brings television to the microcomputer. DVI's concept is simple: information is digitized and stored on a random-access device such as a hard disk or a CD-ROM, and is accessed by a computer. DVI requires extensive compression and real-time decompression of images. Until recently this capability was missing. DVI enables new applications. For example, a DVI CD-ROM disk on twenti-eth-century artists might consist of 20 minutes of motion video; 1,000 high-res still images, each with a minute of audio; and 50,000 pages of text. DVI uses the YUV system, which is also used by the European PAL color television system. The Y channel encodes luminance and the U and V channels encode chrominance. For DVI, we subsample 4-to-1 both vertical-ly and horizontally in U and V, so that each of these components requires only 1/16 the information of the Y component. This provides a compression from the 24-bit RGB space of the original to 9-bit YUV space. The DVI concept originated in 1983 in the inventive environment of the David Sarnoff Research Center in Princeton, New Jersey, then also known as RCA Laboratories. The ongoing research and development of television since the early days of the Laboratories was extending into the digital domain, with work on digital tuners, and digital image processing algo-rithms that could be reduced to cost-effective hardware for mass-market consumer television.

Digital Video Noise Reduction (DVNR) – Digitally removing noise from video by comparing frames in sequence to spot temporal aberrations.

Digital Video Recording – "D1" Component, "D2" Composite.

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 (e.g., Adobe Premiere).

Digital Zoom – A feature found on some camcorders that electronically increases the lens zoom capability by selecting the center of the image and enlarging it digitally.

Digitally Record – To convert analog video and audio signals to digital signals.

Digitization – The process of changing an electronic signal that is an analogy (analog) of a physical process such as vision or hearing into a discrete numerical form. Digitization is subdivided into the processes of sampling the analog signal at a moment in time, quantizing the sample (assigning it a numerical level), and coding the number in binary form. The advantages of digitization include improved transmission; the disad-vantages include a higher bit rate than the analog bandwidth. Bit rate reduction schemes work to reduce that disadvantage.

Digitize – a) The process of turning an analog signal into digital data. **b)** To convert an image from hard copy (a photo) into digital data for display on a computer. **c)** To convert an analog signal into digital form for storage on disk arrays and processing.

Digitizer – A system that converts an analog input to a digital format, such as analog-to-digital converters (ADC), touch tablets and mice. The last two, for example, take a spatial measurement and present it to a computer as a digital representation.

Digitizing – The act of taking analog audio and/or video and converting it to digital form. In 8 bit digital video there are 256 possible steps between maximum white and minimum black.

Digitizing Time – Time taken to record footage into a disk-based editing system, usually from a tape-based analog system, but also from newer digital tape formats without direct digital connections.

DigiTrail – An enhancement of ADO effects by adding trails, smearing, sparkles, etc.

DigiVision – A company with an early line-doubling ATV scheme.

DII (Download Information Indication) – Message that signals the modules that are part of a DSM-CC object carousel.

Dimmer Switch – A control used to gradually increase and decrease the electricity sent to lighting fixture, thereby effecting the amount of light given by the lighting fixture.

DIN (Deutsches Institut fuer Normung) – A German association that sets standards for the manufacture and performance of electrical and electronic equipment, as well as other devices. DIN connectors carry both audio and video signals and are common on equipment in Europe. (Also referred to as Deutsche Industrie Normenausschuss.)

Dip – An adjustment to an audio track in which the volume gain level decreases or "dips" to a lower level, rather than fading completely.

DIP (Dual In-Line Package) – Standard IC package with two parallel rows of pins.

Dipswitch – A block of small switches formed so that they fit into an IC socket or into a PCB on standard IC spacing.

Direct Access Restriction – The ability to limit a user's capability to gain access to material not intended in the product structure. This is not parental control, but it is useful for material such as games or training material where such access would destroy the intent of the product. This type of control is usually accomplished with pre and post commands in the authoring process.

Direct Addressing – Standard addressing mode, characterized by the ability to reach any point in main storage directly. The address is specified as part of the instruction.

Direct Broadcast Satellite (DBS) – a) A distribution scheme involving transmission of signals directly from satellites to homes. It does not carry the burden of terrestrial broadcasting's restricted bandwidth and regulations and so is thought by many to be an ideal mechanism for the introduction of high base bandwidth ATV. DBS is the most effective delivery mechanism for reaching most rural areas; it is relatively poor in urban areas and in mountainous terrain, particularly in the north. Depending on frequency band used, it can be affected by factors such as rain. **b)** Multiple television channel programming service that is transmitted direct from high powered satellites, directly to a home receiving dish.

Direct Color – An SVGA mode for which each pixel color value is specified directly by the contents of a bit field.

Direct Digital Interface – The interconnection of compatible pieces of digital audio or video equipment without conversion of the signal to an analog form.

Direct Draw Overlay – This is a feature that lets you see the video full screen and full motion on your computer screen while editing. Most new 3D graphics cards support this. If yours does not, it simply means you will need an external monitor to view the video. Direct Draw Overlay has absolutely nothing to do with your final video quality.

Direct Memory Access (DMA) – Method of gaining direct access to main storage in order to perform data transfers without involving the CPU.

Direct Recording – A type of analog recording which records and reproduces data in the electrical form of its source.

Direct Sound – The sound which reaches a mike or listener without hitting or bouncing off any obstacles.

Direct to Disk – A method of recording directly to the cutting head of the audio disk cutter, eliminating the magnetic recorder in the sequence, typified by no tape hiss.

Direction Handle – A line extending from a control point that controls the direction of a Bézier curve. Each control point has two direction handles. These two handles together affect how the curve passes through the control point, with one handle controlling how the curve appears before the control point, and the other handle controlling how the curve appears after the control point.

Directional Antenna – An antenna that directs most of its signal strength in a specific direction rather than at equal strength in all directions.

Directional Microphone – One whose sensitivity to sound varies with direction. Such microphones can be aimed so their most sensitive sides face the sound source, while their least sensitive sides face sources of noise or other undesired sound.

Directional Source – Light that emanates from a constant direction with a constant intensity. This is called the infinite light source.

Directory – a) A container in the file system in which you store other directories and files. **b)** A logical or physical portion of a hard disk drive where the operating system stores files.

DirectShow – 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.

Direct-View – A CRT watched directly, as opposed to one projecting its image on a screen.

Dirty List (Dirty EDL) – An edit decision list (EDL) containing overlapping or redundant edits. Contrast with Clean List (Clean EDL).

DIS (Draft International Standard) – The last step before a fast-track document is approved as an International Standard. Note: The fast-track process is a different process than the normal development process. DIS documents are balloted and approved at the TC-level.

Disable – Process of inhibiting a device function.

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.

Discrete – Having an individual identity. An individual circuit component.

Discrete Cosine Transform (DCT) – a) Used in JPEG and the MPEG, H.261, and H.263 video compression algorithms, DCT techniques allow images to be represented in the frequency rather than time domain. Images can be represented in the frequency domain using less information than in the time domain. **b)** A mathematical transform that can be perfectly undone and which is useful in image compression. c) Many encoders perform a DCT on an eight-by-eight block of image data as the first step in the image compression process. The DCT converts the video data from the time domain into the frequency domain. The DCT takes each block, which is a 64-point discrete signal, and breaks it into 64 basis signals. The output of the operation is a set of 64 basis-signal amplitudes, called DCT coefficients. These coefficients are unique for each input signal. The DCT provides a basis for compression because most of the coefficients for a block will be zero (or close to zero) and do not need to be encoded.

Discrete Signals – The sampling of a continuous signal for which the sample values are equidistant in time.

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

Discrete Time Oscillator (DTO) – Digital implementation of the voltage controlled oscillator.

Dish – A parabolic antenna used to receive satellite transmissions at home. The older "C band" dishes measure 7-12 feet in diameter, while the newer "Ku band" dishes used to receive high-powered DBS services can be as small as 18 inches in diameter.

Disk (Menus) – Recall and Store enable effects to be stored, renamed and recalled on 3-1/2" disks in the disk drive provided with the system.

Disk Drive – The machine used to record and retrieve digital information on disk.

Disk Resource – Any disk (hard, CD-ROM, or floppy) that you can access either because it is physically attached to your workstation with a cable, or it is available over the network.

Disk Use – The percentage of space on your disk that contains information.

Disk, Disc – a) An information/digital data storage medium. **b)** A flat circular plate, coated with a magnetic material, on which data may be stored by selective magnetization of portions of the surface. May be a flexible, floppy disk or rigid hard disk. It could also be a plastic compact disc (CD) or digital video disc (DVD).

Dispersion – Distribution of the oxide particles within the binder. A good dispersion can be defined as one in which equal numbers of particles would be found in equal, vanishingly small volumes sampled from different points within the coating.

Displacement Mapping – The adding of a 3D effect to a 2D image.

Displacement of Porches – Refers to any difference between the level of the front porch and the level of the back porch.

Display – a) The ultimate image presented to a viewer; the process of presenting that image. **b)** CRT, LCD, LED or other photo luminescent panel upon which numbers, characters, graphics or other data is presented.

Display Order – The order in which the decoded pictures are displayed. Normally this is the same order in which they were presented at the input of the encoder.

Display Rate – The number of times/sec the image in a video system is refreshed. Progressive scan systems such as film or HDTV change the image once per frame. Interlace scan systems such as standard TV change the image twice per frame, with two fields in each frame. Film has a frame rate of 24 fps but each frame is shown twice by the projector for a display rate of 48 fps. NTSC TV has a rate of 29.97 fps, PAL 25 fps.

Display Signal Processing – An efficient, widely compatible system required that distribution be free of detailed requirements specific to display, and that necessary additional display processing unique to that display class be conducted only at the display. The variety of display systems, already numerous, continues to increase. Each system or variant has its own set of specifications, performance characteristics, and requirements, including electro-optic transfer function, color gamut, scanning sequence, etc. Display signal processing might include transformation at the display to the appropriate luminance range and chrominance, to display primaries and reference white, matrixing to achieve metameric color match, adaptation to surround, plus conversion to scanning progressive or scanning interlaced, etc. Display processing may not be required for transmission if there is unique point-to-point routing clearly identified and appropriate processing has been provided in distribution. But it is frequently required for emission to a diffuse population of display system.

Dissolve – a) A process whereby one video signal is gradually faded out while a second image simultaneously replaces the original one. **b)** A video or audio transition in which an image from one source gradually becomes less distinct as an image from a second source replaces it. An audio dissolve is also called a segue. See also Crossfade, Fade.

Distance Learning – Technologies that allow interactive remote site classes or training by use of multipoint or point-to-point connections.

Distant Miking – Placing a mike far from a sound source so that a high proportion of reflected sound is picked up.

Distant Signal – TV signals which originate at a point too far away to be picked up by ordinary home reception equipment; also signals defined by the FCC as outside a broadcaster's license area. Cable systems are limited by FCC rules in the number of distant signals they can offer subscribers.

Distortion – In video, distortion usually refers to changes in the luminance or chrominance portions of a signal. It may contort the picture and produce improper contrast, faulty luminance levels, twisted images, erroneous colors and snow. In audio, distortion refers to any undesired changes in the waveform of a signal caused by the introduction of spurious elements. The most common audio distortions are harmonic distortion, intermodulation distortion, crossover distortion, transient distortion and phase distortion.

Distribution – a) The process of getting a television signal from point to point; also the process of getting a television signal from the point at which it was last processed to the viewer. See also Contribution. **b)** The delivery of a completed program to distribution-nodes for emission/transmission as an electrical waveform, or transportation as physical package, to the intended audiences. Preparation for distribution is the last step of the production cycle. Typical distribution-nodes include: release and duplicating laboratories, satellite systems, theatrical exchanges, television networks and groups, cable systems, tape and film libraries, advertising and program agencies, educational systems, government services administration, etc.

Distribution Amplifier – Device used to multiply (fan-out) a video signal. Typically, distribution amplifiers are used in duplication studios where many tape copies must be generated from one source or in multiple display setups where many monitors must carry the same picture, etc. May also include cable equalization and/or delay.

Distribution Quality – The level of quality of a television signal from the station to its viewers. Also know as Emission Quality.

DIT (Discontinuity Information Table)

DITEC – See Digital Television Communications System.

Dither – a) Typically a random, low-level signal (oscillation) which maybe added to an analog signal prior to sampling. Often consists of white noise of one quantizing level peak-to-peak amplitude. **b)** The process of representing a color by mixing dots of closely related colors.

Dither Component Encoding – A slight expansion of the analog signal levels so that the signal comes in contact with more quantizing levels. The results are smoother transitions. This is done by adding white noise

(which is at the amplitude of one quantizing level) to the analog signal prior to sampling.

Dither Pattern – The matrix of color or gray-scale values used to represent colors or gray shades in a display system with a limited color palette.

Dithering – Giving the illusion of new color and shades by combining dots in various patterns. This is a common way of gaining gray scales and is commonly used in newspapers. The effects of dithering would not be optimal in the video produced during a videoconference.

DIVX – A commercial and non-commercial video codec that enables high quality video at high compression rates.

DivX – A hacked version of Microsoft's MPEG4 codec.

DLT (Digital Linear Tape) – a) A high capacity data tape format. **b)** A high-density tape storage medium (usually 10-20 gigabytes) used to transport and input data to master a DVD. Media is designated as "Type III" or "Type IV" for tapes used for DVD.

DMA – See Direct Memory Access.

D-MAC – Originally, a MAC (Multiplexed Analog Component) with audio and data frequency multiplexed after modulation, currently a term used in Europe to describe a family of B-MAC-like signals, one of which is the British choice for DBS. See also MAC.

DMD (Digital Micro-Mirror Device) – A new video projection technology that uses chips with a large number of miniature mirrors, whose projection angle can be controlled with digital precision.

DMIF (Digital Storage Media-Command and Control Multimedia Integration Framework) – In November 1996, a work item on DMIF (DSM-CC Multimedia Integration Framework) was accepted as part 6 of the MPEG-4 ISO/IEC 14496 work activity. DMIF extends the concepts in DSM-CC to symmetric conversational applications and the addition of Internet as a core network. These extensions are required to satisfy the needs of MPEG-4 applications.

DMK (Downstream Mixer-Keyer) – See DSK.

DM-M (Delayed Modulation Mark) – Also called Miller Code.

D-Mode – An edit decision list (EDL) in which all effects (dissolves, wipes, graphic overlays) are performed at the end. See also A-Mode, B-Mode, C-Mode, E-Mode, Source Mode.

DNG (Digital News Gathering) – Electronic News Gathering (ENG) using digital equipment and/or transmission.

DNL – Noise reduction system produced by Philips.

DNR (Dynamic Noise Reduction) – This filter reduces changes across frames by eliminating dynamic noise without blurring. This helps MPEG compression without damaging image quality.

Document Window – A sub-window inside an application. The size is user adjustable but limited by the size of its application window.

Dolby AC-2 and AC-3 – These are compression algorithms from the Dolby Laboratories. The AC-2 coding is an adaptive transform coding that includes a filterbank based on time domain alias cancellation (TDAS). The AC-3 is a dedicated multichannel coding, which like AC-2 uses adaptive transform coding with a TDAS filterbank. In addition, AC-3 employs a bit-allocation routine that distributes bits to channels and frequencies depending on the signals, and this improves the coding efficiency compared to AC-2. The AC-3 algorithm is adopted for the 5.1-channel audio surround system in the American HDTV system.

Dolby Digital – Formerly AC-3, a perceptual audio coding system based upon transform coding techniques and psycho-acoustic principles. Frequency-domain processing takes full advantage of noise masking by confining quantization noise to narrow spectral regions where it will be masked by the audio signal. Designed as an emissions (delivery) system, Dolby Digital provides flexible coding of up to 5.1 audio channels at a variety of data rates. In addition, Dolby Digital bit streams carry informational data about the associated audio.

Dolby Laboratories – Founded in 1965, Dolby Laboratories is well known for the technologies it has developed for improving audio sound reproduction, including their noise reduction systems (e.g., Dolby A, B, and C), Dolby Digital (AC-3), Dolby Surround, and more. For more information, visit the Dolby Laboratories website.

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

Dolby Surround – A passive system that matrix encodes four channels of audio into a standard two-channel format (Lt/Rt). When the signal is decoded using a Dolby Surround Pro Logic decoder, the left, center and right signals are recovered for playback over three front speakers and the surround signal is distributed over the rear speakers.

Dolby Surround Pro Logic (DSPL) – An active decoding process designed to enhance the sound localization of Dolby Surround encoded programs through the use of high-separation techniques. Dolby Surround Pro Logic decoders continuously monitor the encoded audio program and evaluate the inherent sound field dominance, applying enhancement in the same direction and in proportion to that dominance.

Dolby™ **–** A compression/expansion (companding) noise reduction system developed by Ray Dolby, widely used in consumer, professional and broadcast audio applications. Signal-to-noise ratio improvement is accomplished by processing a signal before recording and reverse-processing the signal upon playback.

Dolly – a) A set of casters attached to the legs of a tripod to allow the tripod to roll **b)** A forward/backward rolling movement of the camera on top of the tripod dolly.

Domain – a) The smallest known permanent magnet. **b)** Program Chains (PGC) are classified into four types of domains, including First Play Domain, Video Manager Menu Domain, VTS Menu Domain and Title Domain.

Dongle – A hardware device used as a key to control the use of licensed software. The software can be installed on any system but will run only on the system that has a dongle installed. The dongle connects to the Apple Desktop Bus on Macintosh systems or to the parallel (printer) port on PC systems.

Doppler Effect – An effect in which the pitch of a tone rises as its source approaches a listener, and falls as the source moves away from the listener.

DOS (Disk Operating System) – a) A single-user operating system from Microsoft for the PC. It was the first operating system for the PC and is the underlying control program for Windows 3.1, 95, 98 and ME. Windows NT, 2000 and XP emulate DOS in order to support existing DOS applications. **b)** A software package that makes a computer work with its hardware devices such as hard drive, floppy drive, screen, keyboard, etc.

Dot Crawl – See Chroma Crawl.

Dot Matrix – Method of forming characters by using many small dots.

Dot Pitch – a) This is the density measurement of screen pixels specified in pixels/mm. The more dense the pixel count, the better the screen resolution. **b)** The distance between phosphor dots in a tri-color, direct-view CRT. It can be the ultimate determinant of resolution.

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.

Double Precision Arithmetic – Uses two words to represent each number.

Double System – Any film system in which picture and sound are recorded on separate media. A double system requires the resyncing of picture and sound during post-production.

Double-Click – To hold the mouse still, then press and release a mouse button twice, very rapidly. When you double-click an icon it opens into a window; when you double-click the Window menu button the window closes.

Double-Perf Film – Film stock with perforations along both edges of the film.

Double-Strand Editing – See A/B Roll.

Doubling – To overdub the same part that has previously been recorded, with the object of making the part appear to have been performed by several instruments playing simultaneously.

Down Converter – This device accepts modulated high frequency television signals and down converts the signal to an intermediate frequency.

Down Link – a) The frequency satellites use to transmit data to earth stations. **b)** Hardware used to transmit data to earth stations.

Download – The process of having an effect moved from disk storage into the ADO control panel.

Downloadability – Ability of a decoder to load data or necessary decoding tools via Internet or ATM.

Downmix – A process wherein multiple channels are summed to a lesser number of channels. In the audio portion of a DVD there can be as many as 8 channels of audio in any single stream and it is required that all DVD players produce a stereo version of those channels provided on the disc. This capacity is provided as legacy support for older audio systems.

Downscaling – The process of decimating or interpolating data from an incoming video signal to decease the size of the image before placing it into memory.

Downstream – A term describing the precedence of an effect or key. The "stream" of video through a switcher allows multiple layers of effects to be accomplished, with each successive layer appearing on top of the previous one. The most downstream effect is that video which appears as the top-most layer.

Downstream Keyer – The last keyer on the switcher. A key on the DSK will appear in front of all other video. Ampex DSKs are actually DMKs, that is they also allow mixes and fades with the switcher output.

Downstream Keyer (DSK) – A term used for a keyer that inserts the key "downstream" (last layer of video within switcher) of the effects system video output. This enables the key to remain on-air while the backgrounds and effects keys are changed behind it.

DPCM – See Differential Pulse Code Modulation.

D-Pictures – Pictures for which only DC coefficients are transmitted. D-pictures are not part of MPEG-2 but only of MPEG-1. MPEG-2 decoders must be able to decode D-pictures.

Drag – To press and hold down a mouse button, then move the mouse. This drags the cursor to move icons, to highlight menu items, or to perform other functions.

DRAM (Dynamic Random Access Memory) – An integrated circuit device that stores data bits as charges in thousands of tiny capacitors. Since the capacitors are very small, DRAM must be constantly refreshed to restore charges in appropriate cells. DRAM is used for short-term memory such as frame and screen memory and memory which contains operating programs which are loaded from ROM or disk.

DRC (Dynamic Range Control) – A feature of Dolby Digital that allows the end user to retain or modify the dynamic range of a Dolby Digital Encoded program upon playback. The amount of control is dictated by encoder parameter settings and decoder user options.

Drift – Gradual shift or change in the output over a period of time due to change or aging of circuit components. Change is often caused by thermal instability of components.

Drive – A hardware device that lets you access information on various forms of media, such as hard, floppy, and CD-ROM disks, and magnetic tapes.

Drive Address – See SCSI Address.

Drive Pulse – A term commonly used to describe a set of signals needed by source equipment such as a camera. This signal set may be composed of any of the following: sync, blanking, subcarrier, horizontal drive, vertical drive, and burst flag. Also called pulse drive.

Driving Signals – Signals that time the scanning at the pickup device.

Drop Field Scrambling – This method is identical to the sync suppression technique for scrambling analog TV channels, except there is no suppression of the horizontal blanking intervals. Sync pulse suppression only takes place during the vertical blanking interval. The descrambling pulses still go out for the horizontal blanking intervals (to fool unauthorized

descrambling devices). If a descrambling device is triggering on descrambling pulses only, and does not know that the scrambler is using the drop field scrambling technique, it will try to reinsert the horizontal intervals (which were never suppressed). This is known as double reinsertion, which causes compression of the active video signal. An unauthorized descrambling device creates a washed-out picture and loss of neutral sync during drop field scrambling.

Drop Frame – a) System of modifying the frame counting sequence (dropping two frames every minute except on every tenth minute) to allow time code to match a real-time clock. **b)** The timecode adjustment made to handle the 29.97 per second frame rate of color video by dropping certain, agreed-upon frames to compensate for the 0.03 fps discrepancy. Drop-frame timecode is critical in broadcast applications. Contrast with Non-Drop Frame.

Drop Frame Time Code – a) SMPTE time code format that skips (drops) two frames per minute except on the tenth minute, so that the time code stays coincident with real time. **b)** The television broadcast standard for time code. c) The NTSC color coding system uses a 525/60 line/field format, it actually runs at 59.94 fields per second, or 29.97 frames per second (a difference of 1:1000). Time code identifies 30 frames per second, whereas drop frame time code compensates by dropping two frames in every minute except the tenth. Note that the 625/50 PAL system is exact and does not require drop frame.

Drop Outs – Small bit of missing picture information usually caused by physical imperfections in the surface of the video tape.

Drop Shadow – a) A type of key border where a key is made to look three dimensional and as if it were illuminated by a light coming from the upper left by creating a border to the right and bottom. **b)** A key border mode which places a black, white or gray border to the right and below the title key insert, giving a shadow effect.

Drop-Down List Box – Displays a list of possible options only when the list box is selected.

Dropout – a) A momentary partial or complete loss of picture and/or sound caused by such things as dust, dirt on the videotape or heads, crumpled videotape or flaws in the oxide layer of magnetic tape. Uncompensated dropout produces white or black streaks in the picture. **b)** Drop in the playback radio frequency level, resulting from an absence of oxide on a portion of the videotape, causing no audio or video information to be stored there. Dropout usually appears as a quick streak in the video.

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.

Dropout Count – The number of dropouts detected in a given length of magnetic tape.

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.

Dry Signal – A signal without any added effects, especially without reverb.

DS (Dansk Standard) – Danish standarding body.

DS0 (Digital Service Level 0) – 64 kbps.

DS1 (Digital Service Level 1) – 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 (Digital Service Level 3) – One of a hierarchy of North American data transmission rates associated with ISDN and B-ISDN, 44.736 Mbps. The 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.

DSI (Download Server Initiate)

DSK (Downstream Keying) – An effect available in some special effects generators and video mixers in which one video signal is keyed on top of another video signal. The lightest portions of the DSK signal replace the source video leaving the dark areas showing the original video image. Optionally, the DSK signal can be inverted so the dark portions are keyed rather than the lightest portions allowing a solid color to be added to the keyed portions. The DSK input is most commonly a video camera or character generator. The DSK signal must be genlocked to the other signals.

DSK Monitor – A video output showing program video with the DSK key over full time.

DSM – See Digital Storage Media.

DSM-CC (Digital Storage Media-Command and Control) – A syntax defined in the Mpeg-2 Standard, Part 6.

DSM-CC IS U-N (DSM-CC International Standard User-to-Network)

DSM-CC U-N (DSM-CC User-to-Network)

DSM-CC-U-U (DSM-CC User-to-User)

DSNG (Digital Satellite News Gathering) – The use of mobile communications equipment for the purpose of worldwide newscasting. Mobile units are usually vans equipped with advanced, two-way audio and video transmitters and receivers, using dish antennas that can be aimed at geostationary satellites.

DSP (Digital Signal Processing) – a) A DSP segments the voice signal into frames and stores them in voice packets. It usually refers to the electronic circuit section of a device capable of processing digital signals. **b)** When applied to video cameras, DSP means that the analog signal from the CCD sensors is converted to a digital signal. It is then processed for signal separation, bandwidth settings and signal adjustments. After processing, the video signal either remains in the digital domain for recording by a digital VTR or is converted back into an analog signal for recording or transmission. DSP is also being used in other parts of the video chain, including VTRs, and switching and routing devices.

DSRC (David Sarnoff Research Center) – Formerly RCA Laboratories (now part of SRI International), home of the ACTV research.

DSS (Direct Satellite System) – An alternative to cable and analog satellite reception initially utilizing a fixed 18-inch dish focused on one or more geostationary satellites. DSS units are able to receive multiple chan-

nels of multiplexed video and audio signals as well as programming information, email, and related data. DSS typically used MPEG-2 video and audio encoding.

DSSB (Dual Single Sideband) – A modulation technique that might be applied to two of the components of ACTV.

DTE – See Data Terminal Equipment.

DTG (Digital Terrestrial Group) – Over 80 companies that are working together for the implementation of digital television around the world, but most importantly in the UK.

DTM (Digital Transmodulation)

DTMF (Dual Tone Multi-Frequency) – The type of audio signals that are generated when you press the buttons on a touch-tone telephone.

D-to-A Converter (Digital to Analog Converter) – A device that converts digital signals to analog signals.

DTS (Decoding Time Stamp) – Part of PES header indicating when an access unit is to be decoded.

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

DTS (Digital Theater Systems) – It is a multi-channel surround sound format, similar to Dolby Digital. 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 version of DTS decoding that is compatible with 6.1-channel Dolby Surround EX. DTS-ES Discrete is a variation of DTS encoding and decoding that carries a discrete rear center channel instead of a matrixed channel.

DTT (Digital Terrestrial Television) – The term used in Europe to describe the broadcast of digital television services using terrestrial frequencies.

DTTV (Digital Terrestrial Television) – DTTV (digital terrestrial television, sometimes also abbreviated DTT) is digital television (DTV) broadcast entirely over earthbound circuits. A satellite is not used for any part of the link between the broadcaster and the end user. DTTV signals are broadcast over essentially the same media as the older analog terrestrial TV signals. The most common circuits use coaxial cable at the subscriber end to connect the network to the TV receiver. Fiber optic and/or microwave links may be used between the studio and the broadcast station, or between the broadcast station and local community networks. DTTV provides a clearer picture and superior sound quality when compared to analog TV, with less interference. DTTV offers far more channels, thus providing the viewer with a greater variety of programs to choose from. DTTV can be viewed on personal computers. Using a split-screen format, a computer user can surf the Web while watching TV.

DTTV-SA (Digital Terrestrial Television – System Aspects)

DTV (Digital Television) – a) A term used for all types of digital television including High Definition Television and Standard Definition Television. **b)** Another acronym for the new digital television standards. **c)** The technology enabling the terrestrial transmission of television programs as data. See HDTV.

DTV Team – Originally Compaq, Microsoft and Intel, later joined by Lucent Technology. 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.)

DTVB (Digital Television Broadcasting)

DTVC (Digital Television by Cable)

Dual Capstan – Refers to a transport system in which a capstan and pinchroller are used on both sides of the recording and playback head system.

Dual Channel Audio – A mode, where two audio channels are encoded within one bit stream. They may be played simultaneously (stereo) or independently (two languages).

Dub – a) A duplicate copy made from one recording medium to another. **b)** To record or mix pre-recorded audio or video from one or more sources to a another source to create a single recording. See also, Bump-Up.

Dubbing – a) In videotape production, the process of copying video or audio from one tape to another. **b)** In film production, the process of replacing dialog on a sound track. See also ADR, Foley.

Dubmaster – A second-generation copy of a program master used for making additional preview or distribution copies, thereby protecting the master from overuse.

Dubs – Copies of videotape.

Dupe – To duplicate. A section of film or video source footage that has been repeated (duplicated) one or more times in an edited program.

Dupe List – A sublist of duplicated clips of film requiring additional prints or copies of negative for film finishing. See also Cut List.

Dupe Reel – A reel designated for the recording and playback of dupes (duplicate shots) during videotape editing.

Duplex – A communication system that carries information in both direction is called a duplex system. In CCTV, duplex is often used to describe the type of multiplexer that can perform two functions simultaneously, recording in multiplex mode and playback in multiplex mode. It can also refer to duplex communication between a matrix switcher and a PTZ site driver, for example.

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

Durability – Usually expressed as a number of passes that can be made before a significant degradation of output occurs; divided by the corresponding number that can be made using a reference tape.

Duration – Length of time (in hours, minutes, seconds and frames) that a particular effect or section of audio or video material lasts.

DV (Digital Video) – This digital VCR format is a cooperation between Hitachi, JVC, Sony, Matsushita, Mitsubishi, Philips, Sanyo, Sharp, Thomson and Toshiba. It uses 6.35 mm (0.25-inch) wide tape in a range of products to record 525/60 or 625/50 video for the consumer (DV) and professional markets (Panasonic's DVCPRO, Sony's DVCAM and Digital-8). All models use digital intra-field DCT-based "DV" compression (about 5:1) to record 8-bit component digital video based on 13.5 MHz luminance sampling.

dv_export – An export mode in Adobe Premiere that enables digital video to be exported through a capture card.

DV25 – The most common form of DV compression. DV25 uses a fixed data rate of 25 megabits per second.

DVB (Digital Video Broadcasting) – Broadcasting TV signals that comply with a digital standard.

DVB-C (Digital Video Broadcasting – Cable) – Broadcasting TV signals that comply with a digital standard by cable (ETS 300 429).

DVB-CA – Support for use of scrambling and conditional access (CA) within digital broadcasting systems (ETR 289).

DVB-CI – Common interface specification for conditional access and other digital video broadcasting decoder applications (EN 50221).

DVB-Cook – A guideline for the use of DVB specifications and standards (TR 101 200).

DVB-CS – Digital video broadcasting baseline system for SMATV distribution systems (ETS 300 473).

DVB-Data – Specification for Data Broadcasting (EN 301 192).

DVB-DSNG – Digital satellite news gathering (DSNG) specification (EN 301 210).

DVB-IRD (Digital Video Broadcasting Integrated Receiver Decoder)– A receiving decoder that can automatically configure itself using the MPEG-2 Program Specific Information (PSI).

DVB-IRDI – Interface for DVB-IRDs (EN 50201).

DVB-M – Measurement guidelines for DVB systems (ETR 290).

DVB-MC – Digital video broadcasting baseline system for multi-point video distribution systems below 10 GHz (EN 300 749).

DVB-MPEG – Implementation guidelines for the use of MPEG-2 systems, video and audio in satellite, cable and terrestrial broadcasting applications (ETR 154).

DVB-MS – Digital video broadcasting baseline system for multi-point video distribution systems at 10 MHz and above (EN 300 748).

DVB-NIP – Network-independent protocols for DVB interactive services (ETS 300 802).

DVB-PDH – DVB interfaces to plesiochronous digital hierarchy (PDH) networks (ETS 300 813).

DVB-PI – DVB-PI (EN 50083-9) describes the electrical, mechanical and some protocol specification for the interface (cable/wiring) between two devices. DVB-PI includes interfaces for CATV/SMATV headends and similar professional equipment. Common interface types such as LVDS/SPI, ASI and SSI are addressed.

DVB-RCC – Interaction channel for cable TV distribution system (CATV) (ETS 300 800).

DVB-RCCL (Return Channel for Cable and LMDS Digital Television Platform) – An older cable standard that used to compete with DOCSIS.

DVB-RCCS – Interaction channel for satellite master antenna TV (SMATV) distribution systems. Guidelines for versions based on satellite and coaxial sections (TR 101 201).

DVB-RCDECT – Interaction channel through the digital enhanced cordless telecommunications (DECT) (EN 301 193).

DVB-RCL – Interaction channel for local multi-point distribution system (LMDS) distribution systems (EN 301 199)

DVB-RCS (Return Channel for Satellite Digital Television Platform) – DVB-RCS is a satellite standard.

DVB-RCT (Return Channel for Terrestrial Digital Television Platform) – Interaction channel through public switched telecommunications network (PSTN)/integrated services digital networks (ISDN) (ETS 300 801).

DVB-S (Digital Video Broadcasting – Satellite) – For broadcasting TV signals to a digital standard by satellite (ETS 300 421).

DVB-SDH – Interfaces to synchronous digital hierarchy (SDH) networks (ETS 300 814).

DVB-SFN – Mega-frame for single frequency network (SFN) synchronization (TS 101 191).

DVB-SI (Digital Video Broadcasting – Service Information) –
a) Information carried in a DVB multiplex describing the contents of different multiplexes. Includes NIT, SDT, EIT, TDT, BAT, RST, and ST.
b) The DVB-SI adds the information that enables DVB-IRDs to automatically tune to particular services and allows services to be grouped into categories with relevant schedule information (ETS 300 468).

DVB-SIM – DVB SimulCrypt. Part 1: headend architecture and synchronization (TS 101 197).

DVB-SMATV – DVB satellite master antenna television (SMATV) distribution systems (EN 300 473).

DVB-SUB – DVB subtitling systems (ETS 300 743).

DVB-T (Digital Video Broadcasting – Terrestrial) – Terrestrial broadcasting of TV signals to a digital standard (ETS 300 744).

DVB-TXT – Specification for conveying ITU-R system B teletext in DVB bitstreams (ETS 300 472).

DVC – See Digital Video Cassette.

DVCAM – Sony's development of native DV which records a 15 micron (15 x 10 6 m, fifteen thousandths of a millimeter) track on a metal evaporated (ME) tape. DVCAM uses DV compression of a 4:1:1 signal for 525/60 (NTSC) sources and 4:2:0 for 625/50 (PAL). 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.

DVCPRO P – This variant of DV uses a video data rate of 50 Mbps – double that of other DV systems – to produce a 480 progressive frames. Sampling is 4:2:0.

DVCPRO50 – 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 chroma-keying). Four 16-bit audio tracks are provided. The format is similar to Digital-S (D9).

DVCPROHD – 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. Eight audio channels are supported. The format is similar to D9 HD.

DVCR – See Digital Video Cassette Recorder.

DVD (Digital Video Disc) – A new format for putting full length movies on a 5" CD using MPEG-2 compression for "much better than VHS" quality. Also known as Digital Versatile Disc.

DVD Forum – An international association of hardware and media manufacturers, software firms and other users of digital versatile discs, created for the purpose of exchanging and disseminating ideas and information about the DVD Format.

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

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

DVD-10 – A DVD format in which 9.4 gigabytes of data can be stored on two sides of a two-layer disc.

DVD-18 – A DVD format in which 17.0 gigabytes of data are stored on two sides of the disc in two layers each.

DVD-5 – A DVD format in which 4.7 gigabytes of data can be stored on one side of a disc in one layer.

DVD-9 – A DVD format in which 8.5 gigabytes of data can be stored on one side of a two-layer disc.

DVDA (DVD Association) – A non-profit industry trade association representing DVD authors, producers, and vendors throughout the world.

DVD-A (DVD Audio) – DVDs that contain linear PCM audio data in any combination of 44.1, 48.0, 88.2, 96.0, 176.4, or 192 kHz sample rates, 16, 20, or 24 bits per sample, and 1 to 6 channels, subject to a maximum bit rate of 9.6 Mbps. With a 176.4 or 192 kHz sample rate, only two channels are allowed. Meridian Lossless Packing (MLP) is a lossless compression method that has an approximate 2:1 compression ratio. The use of MLP is optional, but the decoding capability is mandatory on all DVD-Audio players. Dolby Digital compressed audio is required for any video portion of a DVD-Audio disc.

DVD-Interactive – DVD-Interactive is intended to provide additional capability for users to do interactive operation with content on DVDs or at Web sites on the Internet. It will probably be based on one of three technologies: MPEG-4, Java/HTML, or software from InterActual.

DVD-on-CD – A DVD image stored on a one-sided 650 megabyte CD.

DVD-R (DVD Recordable) – a) A DVD format in which 3.95 gigabytes of data are stored on a one-sided write-once disc. **b)** The authoring use drive (635nm laser) was introduced in 1998 by Pioneer, and the general use format (650nm laser) was authorized by DVD Forum in 2000. DVD-R offers a write-once, read-many storage format akin to CD-R and is used to master DVD-Video and DVD-ROM discs, as well as for data archival and storage applications.

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

DVD-ROM (DVD Read Only Memory) – a) DVD disks for computers. Expected to eventually replace the conventional CD-ROM. The initial version stores 4.7 GB on one disk. DVD-ROM drives for computers will play DVD movie disks. **b)** The base format of DVD. ROM stands for read-only memory, referring to the fact that standard DVD-ROM and DVD-Video discs can't be recorded on. A DVD-ROM can store essentially any form of digital data.

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

DVD-V (DVD Video) – a) Information stored on a DVD-Video can represent over an hour or two of video programming using MPEG video compressed bit streams for presentation. Also, because of navigation features, the programming can be played randomly or by interactive selection. **b)** DVDs that contain about two hours of digital audio, video, and data. The video is compressed and stored using MPEG-2 MP@ML. A variable bit rate is used, with an average of about 4 Mbps (video only), and a peak of 10 Mbps (audio and video). The audio is either linear PCM or Dolby Digital compressed audio. DTS compressed audio may also be used as an option. Linear PCM audio can be sampled at 48 or 96 kHz, 16, 20, or 24 bits per sample, and 1 to 8 channels. The maximum bitrate is 6.144 Mbps, which limits sample rates and bit sizes in some cases. **c)** A standard for storing and reproducing audio and video on DVD-ROM discs, based on MPEG video, Dolby Digital and MPEG audio, and other proprietary data formats.

DVE Move – Making a picture shrink, expand, tumble, or move across the screen.

DVE Wipe – A wipe effect in which the incoming clip appears in the form of a DVE similar to those you create with the DVE tool.

DVE™ (Digital Video Effects) – a) These effects are found in special effects generators which employ digital signal processing to create two or three dimensional wipe effects. DVE generators are getting less expensive and the kind of effects they create getting more popular. The Digital Video Mixer includes such effects. **b)** A "black box" which digitally manipulates the video to create special effects, for example, the ADO (Ampex Digital Optics) system. Common DVE effects include inverting the picture, shrink-

ing it, moving it around within the frame of another picture, spinning it, and a great many more.

D-VHS (Digital – Video Home System) – Digital video recording but based on conventional VHS recording technology. It can record broadcasted, (and typically compressed) digital data, making it compatible with computers and digital televisions, but it still is also compatible with existing analog VHS technology.

DVI – See Digital Video Interactive.

DV-Mini (Mini Digital Video) – A new format for audio and video recording on small camcorders, adopted by the majority of camcorder manufacturers. Video and sound are recorded in a digital format on a small cassette (66_48_12 mm), superseding S-VHS and Hi 8 quality.

DVS (Descriptive Video Services) – Descriptive narration of video for blind or sight-impaired viewers.

DVTR (Digital Video Tape Recorder)

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

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

Dynamic Gain Change – This distortion is present when picture or sync pulse luminance amplitude is affected by APL changes. This is different from APL induced Transient Gain Distortions which only occur at the APL change transition time, rather this distortion refers to gain changes that occur after the APL has changed. The amount of distortion is usually expressed as a percent of the amplitude at 50% APL, although sometimes the overall variation in IRE units is quoted. This is an out of service test. This distortion causes picture brightness to seem incorrect or inconsistent as the scene changes.

Dynamic Gain Distortion – One of several distortions (long-time waveform distortions is another) that may be introduced when, at the sending end of a television facility, the average picture level (APL) of a video signal is stepped from a low value to a high value, or vice versa, when the operating point within the transfer characteristic of the system is affected, thereby introducing distortions on the receiving end.

Dynamic Memory – Memory devices whose stored data must be continually refreshed to avoid degradation. Each bit is stored as a charge on a single MOS capacitor. Because of charge leakage in the transistors, dynamic memory must be refreshed every 2 ms by rewriting its entire contents. Normally, this does not slow down the system but does required additional memory refresh logic.

Dynamic Metadata Dictionary – The standard database of approved, registered Metadata Keys, their definitions, and their allowed formats.

Dynamic Mike – A mike in which the diaphragm moves a coil suspended in a magnetic field to generate an output voltage proportional to the sound pressure level.

Dynamic Range – a) A circuit's signal range. **b)** An audio term which refers to the range between the softest and loudest levels a source can produce without distortion. **c)** The difference, in decibels, between the overload level and the minimum acceptable signal level in a system or transducer. d) The ratio of two instantaneous signal magnitudes, one being the maximum value consistent with specified criteria or performance, the other the maximum value of noise. e) The concept of dynamic range is applicable to many measurements beyond characterization of the video signal, and the ratios may also be expressed as f stops, density differences, illumination or luminance ratios, etc.

Dynamic Range Compression – a) Level adjustment applied to an audio signal in order to limit the difference, or range of the loudest to the softest sounds. **b)** A technique of reducing the range between loud and soft sounds in order to make dialogue more audible, especially when listening at low volume levels. Used in the downmix process of multichannel Dolby Digital sound tracks.

Dynamic Range, Display – The range of luminances actually achieved in a display. The system's overall transfer function is the most informative specification of dynamic range, inasmuch as nonlinear processing has nearly always been applied to the luminance of the reproduced scene. Frequently, however, the dynamic range, display is estimated by observing the reproduction of a stepped gray-scale having calibrated intervals. Conventionally, the dynamic range is reported to include every step whose transition can be detected, no matter how miniscule. Human vision is less adept at judging luminance of extended areas, but particularly sensitive to luminance transitions which may even have been exaggerated by edge enhancement. "Resolved steps" may be reported, therefore, even when the perceived luminance difference between the areas of adjacent steps is not obvious.

Dynamic Range, Image Capture – The range of luminances actually captured in the image is defined and limited by the transfer function which is usually nonlinear. Capture and recording systems traditionally limit their linear response to a central portion of their dynamic range, and may have extended nonlinear shoulder and toe regions. For any scene, it is usually possible to place the luminances of interest on a preferred portion of the transfer function, with excursions into higher and lower limits rolled off or truncated by the respective shoulder and toe of the curve.

Dynamic Resolution – The amount of spatial resolution available in moving pictures. In most television schemes, dynamic resolution is considerably less than static resolution. See also Motion Surprise, Spatial Resolution, and Temporal Resolution.

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 technique 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 smaller but only masking the problem for a few generations. Dynamic rounding is a licensable technique, available form Quantel and is used in a growing number of digital products both from Quantel and other manufacturers.

▶ E

E Mem – Term used for a panel memory system.

E1 – European digital transmission channel with a data rate of 2.048 kbps.

EACEM – European Association of Consumer Electronics Manufacturers

EAPROM (Electrically Alterable Programmable Read-Only Memo) – A PROM whose contents can be changed.

E**arth Station –** Equipment used for transmitting or receiving satellite communications.

EAV (End of Active Video) – A term used with component digital systems.

EB (Errored Block)

EBR – See Electron Beam Recording.

EBU (European Broadcasting Union) – An organization of European broadcasters that, among other activities, produces technical statements and recommendations for the 625/50 line televi-sion system. Created in 1950 and headquartered in Geneva, Switzerland, the EBU is the world's largest professional association of national broadcasters. The EBU assists its members in all areas of broadcasting, briefing them on developments in the audio-visual sector, providing advice and defending their interests via international bodies. The Union has active members in European and Mediterranean countries and associate members in countries elsewhere in Africa, the Americas and Asia.

EBU TECH.3267-E – a) The EBU recommendation for the serial composite and component interface of 625/50 digital video signal including embed-ded digital audio. **b)** The EBU recommendation for the parallel interface of 625 line digital video signal. A revision of the earlier EBU Tech.3246-E, which in turn was derived from CCIR-601 and contributed to CCIR-656 standards.

EBU Timecode – The timecode system created by the EBU and based on SECAM or PAL video signals.

ECC (Error Correction Code) – A type of memory that corrects errors on the fly.

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

ECC/EDC (Error Correction Code/Error Detection Code) – Allows data that is being read or transmitted to be checked for errors and, when nec-essary, corrected on the fly. It differs from parity-checking in that errors are not only detected but also corrected. ECC is increasingly being designed into data storage and transmission hardware as data rates (and therefore error rates) increase.

Eccentricity – A mathematical constant that for an ellipse is the ratio between the major and minor axis length.

Echo (or Reflection) – a) A wave which has been reflected at one or more points in the transmission medium, with sufficient magnitude and time difference to be perceived in some manner as a wave distinct from that of the main or primary transmission. Echoes may be either leading or lagging the primary wave and appear in the picture monitor as reflections or "ghosts". **b)** Action of sending a character input from a keyboard to the printer or display.

Echo Cancellation – Reduction of an echo in an audio system by estimating the incoming echo signal over a communications connection and subtracting its effects from the outgoing signal.

Echo Plate – A metal plate used to create reverberation by inducing waves in it by bending the metal.

E-Cinema – An HDTV film-complement format introduced by Sony in 1998. 1920 x 1080, progressive scan, 24 fps, 4:4:4 resolution. Using a 1/2-inch tape, the small cassette (camcorder) will hold 50 minutes while the large cassette will hold 156 minutes. E-Cinema's camcorder will use three 2/3-inch FIT CCDs and is equivalent to a film sensitivity of ISO 500. The format will compress the electronic signal somewhere in the range of 7:1. The format is based on the Sony HDCAM video format.

ECL (Emitter Coupled Logic) – A variety of bipolar transistor that is noted for its extremely fast switching speeds.

ECM – See Entitlement Control Message.

ECMA (European Computer Manufacturers Association) – An international association founded in 1961 that is dedicated to establishing standards in the information and communications fields.

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

ECU (Extreme Closeup)

ED-Beta (Extended Definition Betamax) – A consumer/Professional videocassette format developed by Sony offering 500-line horizontal resolution and Y/C connections.

Edge – a) An edge is the straight line that connects two points. **b)** Synonym for key border. Used by our competitors but not preferred by Ampex. **c)** A boundary in an image. The apparent sharpness of edges can be increased without increasing resolution. See also Sharpness.

Edge Busyness – Distortion concentrated at the edge of objects, characterized by temporally varying sharpness or spatially varying noise.

Edge Curl – Usually occurs on the outside one-sixteenth inch of the videotape. If the tape is sufficiently deformed it will not make proper tape contact with the playback heads. An upper curl (audio edge) crease may affect sound quality. A lower edge curl (control track) may result in poor picture quality.

Edge Damage – Physical distortion of the top or bottom edge of the magnetic tape, usually caused by pack problems such as popped strands or stepping. Affects audio and control track sometimes preventing playback.

Edge Effect – See Following Whites or Following Blacks.

Edge Enhancement – Creating hard, crisp, high-contrast edges beyond the correction of the geometric problem compensated by aperture correction, frequently creates the subjective impression of increase image detail. Transversal delay lines and second-directive types of correction increase the gain at higher frequencies while introducing rather symmetrical "undershoot followed by overshoot" at transitions. In fact, and contrary to many causal observations, image resolution is thereby decreased and fine detail becomes obscured. Creating a balance between the advantages and disadvantages is a subjective evaluation and demands an artistic decision.

Edge Enhancing – See Enhancing.

Edge Filter – A filter that applies anti-aliasing to graphics created to the title tool.

Edge Numbers – Numbers printed on the edge of 16 and 35 mm motion picture film every foot which allows frames to be easily identified in an edit list.

Edgecode – See Edge Numbers, Key Numbers.

EDH (Error Detection and Handling) – Defined by SMPTE standards RP-165 and is used for recognizing inaccuracies in the serial digital signal. It may be incorporated into serial digital equipment and employ a simple LED error indicator. This data conforms to the ancillary data formatting standard (SMPTE 291M) for SD-SDI and is located on line 9 for 525 and line 5 for 625 formats.

Edit – a) The act of performing a function such as a cut, dissolve, wipe on a switcher, or a cut from VTR to VTR where the end result is recorded on another VTR. The result is an edited recording called a master. **b)** Any point on a video tape where the audio or video information has been added to, replaced, or otherwise altered from its original form.

Edit Control – A connection on a VCR or camcorder which allows direct communication with external edit control devices. (e.g., LANC (Control-L) and new (Panasonic) 5-pin). Thumbs Up works with both of these control formats and with machines lacking direct control.

Edit Controller – An electronic device, often computer-based, that allows an editor to precisely control, play and record to various videotape machines.

Edit Decision List (EDL) – a) A list of a video production's edit points. An EDL is a record of all original videotape scene location time references, corresponding to a production's transition events. EDLs are usually generated by computerized editing equipment and saved for later use and modification. **b)** Record of all edit decisions made for a video program (such as in-times, out-times, and effects) in the form of printed copy, paper tape, or floppy disk file, which is used to automatically assemble the program at a later point.

Edit Display – Display used exclusively to present editing data and editor's decision lists.

Edit Master – The first generation (original) of a final edited tape.

Edit Point – The location in a video where a production event occurs. (e.g., dissolve or wipe from one scene to another).

Edit Rate – In compositions, a measure of the number of editable units per second in a piece of media data (for example, 30 fps for NTSC, 25 fps for PAL and 24 fps for film).

Edit Sequence – An assembly of clips.

Editing – A process by which one or more compressed bit streams are manipulated to produce a new compressed bit stream. Conforming edited bit streams are understood to meet the requirements defined in the Digital Television Standard.

Editing Control Unit (ECU) – A microprocessor that controls two or more video decks or VCRs and facilitates frame-accurate editing.

Editor – A control system (usually computerized) which allows you to control video tape machines, the video switcher, and other devices remotely from a single control panel. Editors enable you to produce finished video programs which combine video tape or effects from several different sources.

EDL (Edit Decision List) – A list of edit decisions made during an edit session and usually saved to floppy disk. Allows an edit to be redone or modified at a later time without having to start all over again.

EDO DRAM (Extended Data Out Dynamic Random Access Memory) – EDO DRAM allows read data to be held past the rising edge of CAS (Column Address Strobe) improving the fast page mode cycle time critical to graphics performance and bandwidth. EDO DRAM is less expensive than VRAM.

EDTV – See Extended/Enhanced Definition Television.

E-E Mode (Electronic to Electronic Mode) – The mode obtained when the VTR is set to record but the tape is not running. The VTR is processing all the signals that it would normally use during recording and playback but without actually recording on the tape.

EEprom E2, E'squared Prom – An electronically-erasable, programmable read-only memory device. Data can be stored in memory and will remain there even after power is removed from the device. The memory can be erased electronically so that new data can be stored.

Effect – a) One or more manipulations of the video image to produce a desired result. **b)** Multi-source transition, such as a wipe, dissolve or key.

Effective Competition – Market status under which cable TV systems are exempt from regulation of basic tier rates by local franchising authorities, as defined in 1992 Cable Act. To claim effective competition, a cable system must compete with at least one other multi-channel provider that is available to at least 50% of an area's households and is subscribed to by more than 15% of the households.

Effects – The manipulation of an audio or video signal. Types of film or video effects include special effects (F/X) such as morphing; simple effects such as dissolves, fades, superimpositions, and wipes; complex effects such as keys and DVEs; motion effects such as freeze frame and slow motion; and title and character generation. Effects usually have to be rendered because most systems cannot accommodate multiple video streams in real time. See also Rendering.

Effects (Setup) – Setup on the AVC, Century or Vista includes the status of every push-button, key setting, and transition rate. The PANEL-MEM system can store these setups in memory registers for future use.

Effects Keyer (E Keyer) – The downstream keyer within an M/E, i.e., the last layer of video.

Effects System – The portion of the switcher that performs mixes, wipes and cuts between background and/or affects key video signals. The Effects System excludes the Downstream Keyer and Fade-to-Black circuitry. Also referred to as Mix Effects (M/E) system.

EFM (Eight-to-Fourteen Modulation) – This low-level and very critical channel coding technique maximizes pit sizes on the disc by reducing frequent transitions from 0 to 1 or 1 to 0. CD represents 1's as Land-pit transitions along the track. The 8/14 code maps 8 user data bits into 14 channel bits in order to avoid single 1's and 0's, which would otherwise require replication to reproduce extremely small artifacts on the disc. In the 1982 compact disc standard (IEC 908 standard), 3 merge bits are added to the 14 bit block to further eliminate 1-0 or 0-1 transitions between adjacent 8/14 blocks.

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

EGA (Enhanced Graphics Adapter) – A display technology for the IBM PC. It has been replaced by VGA. EGA pixel resolution is 640 x 350.

EIA (Electronics Industries Association) – A trade organization that has created recommended standards for television systems (and other electronic products), including industrial television systems with up to 1225 scanning lines. EIA RS-170A is the current standard for NTSC studio equipment. The EIA is a charter member of ATSC.

EIA RS-170A – The timing specification standard for NTSC broadcast video equipment. The Digital Video Mixer meets RS-170A.

EIA/IS-702 – NTSC Copy Generation Management System – Analog (CGMS-A). This standard added copy protection capabilities to NTSC video by extending the EIA-608 standard to control the Macrovision anti-copy process. It is now included in the latest EIA-608 standard.

EIA-516 – U.S. teletext standard, also called NABTS.

EIA-608 – U.S. closed captioning and extended data services (XDS) standard. Revision B adds Copy Generation Management System – Analog (CGMS-A), content advisory (v-chip), Internet Uniform Resource Locators (URLs) using Text-2 (T-2) service, 16-bit Transmission Signal Identifier, and transmission of DTV PSIP data.

EIA-708 – U.S. DTV closed captioning standard. EIA CEB-8 also provides guidance on the use and processing of EIA-608 data streams embedded within the ATSC MPEG-2 video elementary transport stream, and augments EIA-708.

EIA-744 – NTSC "v-chip" operation. This standard added content advisory filtering capabilities to NTSC video by extending the EIA-608 standard. It is now included in the latest EIA-608 standard, and has been withdrawn.

EIA-761 – Specifies how to convert QAM to 8-VSB, with support for OSD (on screen displays).

EIA-762 – Specifies how to convert QAM to 8-VSB, with no support for OSD (on screen displays).

EIA-766 – U.S. HDTV content advisory standard.

EIA-770 – This specification consists of three parts (EIA-770.1, EIA-770.2, and EIA-770.3). EIA-770.1 and EIA-770.2 define the analog YPbPr video interface for 525-line interlaced and progressive SDTV systems. EIA-770.3 defines the analog YPbPr video interface for interlaced and progressive HDTV systems. EIA-805 defines how to transfer VBI data over these YPbPr video interfaces.

EIA-775 – EIA-775 defines a specification for a baseband digital interface to a DTV using IEEE 1394 and provides a level of functionality that is similar to the analog system. It is designed to enable interoperability between a DTV and various types of consumer digital audio/video sources, including set top boxes and DVRs or VCRs. EIA-775.1 adds mechanisms to allow a source of MPEG service to utilize the MPEG decoding and display capabilities in a DTV. EIA-775.2 adds information on how a digital storage device, such as a D-VHS or hard disk digital recorder, may be used by the DTV or by another source device such as a cable set-top box to record or time-shift digital television signals. This standard supports the use of such storage devices by defining Service Selection Information (SSI), methods for managing discontinuities that occur during recording and playback, and rules for management of partial transport streams. EIA-849 specifies profiles for various applications of the EIA-775 standard, including digital streams compliant with ATSC terrestrial broadcast, direct-broadcast satellite (DBS), OpenCable™, and standard definition Digital Video (DV) camcorders.

EIA-805 – This standard specifies how VBI data are carried on component video interfaces, as described in EIA-770.1 (for 480p signals only), EIA-770.2 (for 480p signals only) and EIA-770.3. This standard does not apply to signals which originate in 480i, as defined in EIA-770.1 and EIA-770.2. The first VBI service defined is Copy Generation Management System (CGMS) information, including signal format and data structure when carried by the VBI of standard definition progressive and high definition YPbPr type component video signals. It is also intended to be usable when the YPbPr signal is converted into other component video interfaces including RGB and VGA.

EIA-861 – The EIA-861 standard specifies how to include data, such as aspect ratio and format information, on DVI and HDMI.

EIAJ (Electronic Industry Association of Japan) – The Japanese equivalent of the EIA.

EIA-J CPR-1204 – This EIA-J recommendation specifies another widescreen signaling (WSS) standard for NTSC video signals.

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

EISA (Enhanced Industry Standard Architecture) – In 1988 a consortium of nine companies developed 32-bit EISA which was compatible with AT architecture. The basic design of EISA is the result of a compilation of the best designs of the whole computer industry rather than (in the case of

the ISA bus) a single company. In addition to adding 16 new data lines to the AT bus, bus mastering, automated setup, interrupt sharing, and advanced transfer modes were adapted making EISA a powerful and useful expansion design. The 32-bit EISA can reach a peak transfer rate of 33 MHz, over 50% faster than the Micro Channel architecture. The EISA consortium is presently developing EISA-2, a 132 MHz standard.

EISA Slot – Connection slot to a type of computer expansion bus found in some computers. EISA is an extended version of the standard ISA slot design.

EIT (Encoded Information Type)

EIT (Event Information Table) – Contains data concerning events (a grouping of elementary broadcast data streams with a defined start and end time belonging to a common service) and programs (a concatenation of one or more events under the control of a broadcaster, such as event name, start time, duration, etc.). Part of DVB-SI.

Electromagnetic Interference (EMI) – Interference caused by electrical fields.

Electron Beam Recording – A technique for converting television images to film using direct stimulation of film emulsion by a very fine long focal length electronic beam.

E**lectronic Beam Recorder (EBR) –** Exposes film directly using an electronic beam compared to recording from a CRT.

Electronic Cinematography – Photographing motion pictures with television equipment. Electronic cinematography is often used as a term indicating that the ultimate product will be seen on a motion picture screen, rather than a television screen. See also HDEP and Mathias.

Electronic Crossover – A crossover network which uses active filters and is used before rather than after the signal passes through the power amp.

Electronic Editing – The assembly of a finished video program in which scenes are joined without physically splicing the tape. Electronic editing requires at least two decks: one for playback and the other for recording.

Electronic Matting – The process of electronically creating a composite image by replacing portions of one image with another. One common, if rudimentary, form of this process is chroma-keying, where a particular color in the foreground scene (usually blue) is replaced by the background scene. Electronic matting is commonly used to create composite images where actors appear to be in places other than where they are being shot. It generally requires more chroma resolution than vision does, causing contribution schemes to be different than distribution schemes. While there is a great deal of debate about the value of ATV to viewers, there does not appear to be any dispute that HDEP can perform matting faster and better than almost any other moving image medium.

Electronic Pin Register (EPR) – Stabilizes the film transport of a telecine. Reduces ride (vertical moment) and weave (horizontal movement). Operates in real time.

Electrostatic Pickup – Pickup of noise generated by electrical sparks such as those caused by fluorescent lights and electrical motors.

Elementary Stream (ES) – a) The raw output of a compressor carrying a single video or audio signal. **b)** A generic term for one of the coded video, coded audio, or other coded bit streams. One elementary stream is carried in a sequence of PES packets with one and only one stream_id.

Elementary Stream Clock Reference (ESCR) – A time stamp in the PES from which decoders of PES may derive timing.

Elementary Stream Descriptor – A structure contained in object descriptors that describes the encoding format, initialization information, transport channel identification, and other descriptive information about the content carried in an elementary stream.

Elementary Stream Header (ES Header) – Information preceding the first data byte of an elementary stream. Contains configuration information for the access unit header and elementary stream properties.

Elementary Stream Interface (ESI) – An interface modeling the exchange of elementary stream data and associated control information between the Compression Layer and the Sync Layer.

Elementary Stream Layer (ES Layer) – A logical MPEG-4 Systems Layer that abstracts data exchanged between a producer and a consumer into Access units while hiding any other structure of this data.

Elementary Stream User (ES User) – The MPEG-4 systems entity that creates or receives the data in an elementary stream.

ELG (European Launching Group) – Now superseded by DVB.

EM (Electronic Mail) – Commonly referred to as E-mail.

Embedded Audio – a) Embedded digital audio is mul-tiplexed onto a serial digital data stream within the horizontal ancillary data region of an SDI signal. A maximum of 16 channels of audio can be carried as standardized with SMPTE 272M or ITU-R.BT.1305 for SD and SMPTE 299 for HD. **b)** Digital audio that is multiplexed and carried within an SDI connection – so simplifying cabling and routing. The standard (ANSI/SMPTE 272M-1994) allows up to four groups each of four mono audio channels.

Embossing – An artistic effect created on AVAs and/or switchers to make characters look like they are (embossed) punched from the back of the background video.

EMC (Electromagnetic Compatibility) – Refers to the use of components in electronic systems that do not electrically interfere with each other. See also EMI.

EMF (Equipment Management Function) – Function connected to all the other functional blocks and providing for a local user or the Telecommunication Management Network (TMN) a mean to perform all the management functions of the cross-connect equipment.

EMI (Electromagnetic Interference) – An electrical disturbance in a system due to natural phenomena, low-frequency waves from electromechanical devices or high-frequency waves (RFI) from chips and other electronic devices. Allowable limits are governed by the FCC. See also EMC.

Emission – a) The propagation of a signal via electromagnetic radiation, frequently used as a synonym for broadcast. **b)** In CCIR usage: radio-frequency radiation in the case where the source is a radio transmitter or radio waves or signals produced by a radio transmitting station. **c)** Emission in electronic production is one mode of distribution for the completed program, as an electromagnetic signal propagated to the point of display.

EMM – See Entitlement Management Message.

E-Mode – An edit decision list (EDL) in which all effects (dissolves, wipes and graphic overlays) are performed at the end. See also A-Mode, B-Mode, C-Mode, D-Mode, Source Mode.

Emphasis – a) Filtering of an audio signal before storage or transmission to improve the signal-to-noise ratio at high frequencies. **b)** A boost in signal level that varies with frequency, usually used to improve SNR in FM transmission and recording systems (wherein noise increases with frequency) by applying a pre-emphasis before transmission and a complementary de-emphasis to the receiver. See also Adaptive Emphasis.

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

Enable – Input signal that allows the device function to occur.

ENB (Equivalent Noise Bandwidth) – The bandwidth of an ideal rectangular filter that gives the same noise power as the actual system.

Encode – a) The process of combining analog or digital video signals, e.g., red, green and blue, into one composite signal. **b)** To express a single character or a message in terms of a code. To apply the rules of a code. **c)** To derive a composite luminance-chrominance signal from R, G, B signals. **d)** In the context of Indeo video, the process of converting the color space of a video clip from RGB to YUV and then compressing it. See Compress, RGB, YUV. Compare Decode.

Encoded Chroma Key – Synonym for Composite Chroma Key.

Encoded Subcarrier – A reference system created by Grass Valley Group to provide exact color timing information.

Encoder – a) A device used to form a single composite color signal (NTSC, PAL or SECAM) from a set of component signals. An encoder is used whenever a composite output is required from a source (or recording) which is in component format. **b)** Sometimes devices that change analog signals to digital (ADC). All NTSC cameras include an encoder. Because many of these cameras are inexpensive, their encoders omit many of the advanced techniques that can improve NTSC. CAV facilities can use a single, advanced encoder prior to creating a final NTSC signal. **c)** An embodiment of an encoding process.

Encoding (Process) – A process that reads a stream of input pictures or audio samples and produces a valid coded bit stream as defined in the Digital Television Standard.

Encryption – a) The process of coding data so that a specific code or key is required to restore the original data. In broadcast, this is used to make transmission secure from unauthorized reception as is often found on satellite or cable systems. **b)** The rearrangement of the bit stream of a previously digitally encoded signal in a systematic fashion to make the information unrecognizable until restored on receipt of the necessary authorization key. This technique is used for securing information transmitted over a communication channel with the intent of excluding all other than authorized receivers from interpreting the message. Can be used for voice, video and other communications signals.

END (Equivalent Noise Degradation)

End Point – End of the transition in a dissolve or wipe.

Energy Plot – The display of audio waveforms as a graph of the relative loudness of an audio signal.

ENG (Electronic News Gathering) – Term used to describe use of video-recording instead of film in news coverage.

ENG Camera (Electronic News Gathering camera) – Refers to CCD cameras in the broadcast industry.

Enhancement Layer – A relative reference to a layer (above the base layer) in a scalable hierarchy. For all forms of scalability, its decoding process can be described by reference to the lower layer decoding process and the appropriate additional decoding process for the Enhancement Layer itself.

Enhancing – Improving a video image by boosting the high frequency content lost during recording. There are several types of enhancement. The most common accentuates edges between light and dark images.

ENRZ (Enhanced Non-Return to Zero)

Entitlement Control Message (ECM) – Entitlement control messages are private conditional access information. They are program-specific and specify control and scrambling parameters.

Entitlement Management Message (EMM) – Private Conditional Access information which specifies the authorization levels or the services of specific decoders. They may be addressed to individual decoder or groups of decoders.

Entrophy – The average amount of information represented by a symbol in a message. It represents a lower bound for compression.

Entrophy Coding – Variable-length lossless coding of the digital representation of a signal to reduce redundancy.

Entrophy Data – That data in the signal which is new and cannot be compressed.

Entropy – In video, entropy, the average amount of information represented by a symbol in a message, is a function of the model used to produce that message and can be reduced by increasing the complexity of the model so that it better reflects the actual distribution of source symbols in the original message. Entropy is a measure of the information contained in a message, it's the lower bound for compression.

Entry – The point where an edit will start (this will normally be displayed on the editor screen in time code).

Entry Point – The point in a coded bit stream after which the decoder can be initialized and begin decoding correctly. The picture that follows the entry point will be an I-picture or a P-picture. If the first transmitted picture is not an I-picture, the decoder may produce one or more pictures during acquisition. Also referred to as an Access Unit (AU).

E-NTSC – A loosely applied term for receiver-compatible EDTV, used by CDL to describe its Prism 1 advanced encoder/decoder family.

ENTSC – Philips ATV scheme now called HDNTSC.

Envelope Delay – The term "Envelope Delay" is often used interchangeably with Group Delay in television applications. Strictly speaking, envelope delay is measured by passing an amplitude modulated signal through the system and observing the modulation envelope. Group Delay on the other

hand, is measured directly by observing phase shift in the signal itself. Since the two methods yield very nearly the same result in practice, it is safe to assume the two terms are synonymous.

Envelope Detection – A demodulation process in which the shape of the RF envelope is sensed. This is the process performed by a diode detector.

Envelope Detector – A form of device in a television set that begins the process of converting a broadcast or CATV television signal into a video signal that can be displayed. Envelope detectors are sensitive to some of the modifications to television signals that have been proposed for receiver-compatible ATV systems.

EPG (Electronic Program Guide) – a) An electronic program guide is delivered by data transfer rather than printed paper. The EPG gives the content of the current program. **b)** Display that describes all programs and events available to the viewer. It functions like an interactive TV guide that allows users to view a schedule of available programming and select an event for viewing.

EPROM (Erasable Programmable Read Only Memory) – a) A PROM that can be reused. Most EPROMs can be erased by exposing them to ultraviolet light. b) Erasable and programmable read only memory. An electronic chip used in many different security products that stores software instructions for performing various operations.

EPS (Encapsulated PostScript) – A standard file format for high-resolution PostScript illustrations.

EPU (European Platforms Union) – EPU is a body that coordinates national platforms in Europe for widescreen TV and the migration to HDTV. EPU seeks to promote and to coordinate knowledge about widescreen TV, embracing broadcasting, medicine, corporate and cinema use. EPU emphasizes digital aspects and the migration to HDTV, but not necessarily 1250 line HDTV. Through the EPU, the national platforms may exchange experience, facts and views.

EQ – See Equalization.

EQTV (Enhanced Quality Television) – See EDTV.

Equalization (EQ) – a) Process of altering the frequency response of a video amplifier to compensate for high-frequency losses in coaxial cable. **b)** The selective amplification or attenuation of certain frequencies. **c)** The balancing of various frequencies to create a pleasing sound by attenuating or boosting specific frequencies within the sound.

Equalizer – a) Equipment designed to compensate for loss and delay frequency effects within a system. A component or circuit that allows for the adjustment of a signal across a given band. **b)** The pulses which occur before and after the broad pulses in the vertical interval. These pulses help the horizontal oscillator to maintain synchronization. See Equalizing Pulses.

Equalizing Pulses – Pulses of one-half the width of the horizontal sync pulses which are transmitted at twice the rate of the horizontal sync pulses during the blanking intervals immediately preceding and following the vertical sync pulses. The action of these pulses causes the vertical deflection to start at the same time in each interval, and also serves to keep the horizontal sweep circuits in step during the vertical blanking intervals immediately preceding and following the vertical sync pulse.

Equipment Noise – See Noise.

Equivalent Input Noise – Noise created by the input stage of an amplifier which appears in the output of the amplifier increased in level by the gain of the amp.

Erase Adj. – A control which adjusts the coupling of the bias oscillator to the erase head in a manner which purifies the oscillator's waveform.

Erase Field Strength – The minimum initial amplitude of a decreasing alternating field (normally applied in the longitudinal direction) required to reduce the output of a given recorded signal by a specified amount.

Erase Head – A device used to remove recorded signals from magnetic tape.

Erased Noise – The noise arising when reproducing a bulk erased tape with the erase and record heads completely de-energized.

Erasure – A process by which a signal recorded on a tape is removed and the tape made ready for rerecording.

Error – In digital recording, either a dropout or a noise pulse that exceeds a certain limit is usually termed an error. In video and instrumentation recording, an error has no commonly accepted meaning but is defined in relation to the particular system requirements.

Error Blocks – A form of block distortion where one or more blocks in the received image bear no resemblance to the current or previous scene and often contrast greatly with adjacent blocks.

Error Concealment – a) A technique used when error correction fails (see error correction). Erroneous data is replaced by data synthesized from surrounding pixels. **b)** When the error correction program discovers in the reproduced signal, an error too extensive to permit reconstruction, the redundancy in most image information makes it possible for error concealment to make the error nearly inobvious. Video images are frequently nearly identical from frame to frame. Adjacent video lines frequently have almost the same detail. It becomes possible, therefore, when a "burst error" involving the modification or loss of many recorded bits occurs, to determine from image segments adjacent in time or in space, a most probable substitution. Such substitutions, when infrequent and supported by the image redundancy, are often accepted by the viewers as "correct". (This is a degree of freedom in image data recording that obviously is not available to scientific and financial data recording. The additional information needed by the algorithm for decision and substitution is usually provided by a data-storage cache established during reproduction.

Error Correction Tool – One of the tools of the Protection Layer used to correct corrupted information detected by error detection tools at the same layer.

Error Detection and Correction – a) Coding schemes incorporated into the information before it is transmitted (or stored) in such a way that errors which may arise in transmission can be detected and corrected before restoration or retrieval. In PCM systems, error correction effectively improves the SNR of the system. **b)** Ingenious software programs make it possible to check that the digital stream of image information has not been corrupted by the loss of a few bit here and there. Additional information introduced as "overhead" to the image bit stream (thereby increasing the bit rate, recording) is chosen to conform to specific rules of construction. Departures from this construction can be detected readily, so that many

potential errors can not only be identified, but corrected so that the information can be restored with high probability. Error correction contributes to the reliability of recording/reproducing and is a normal part of all data recording.

Error Detection Tool – One of the tools of the Protection Layer used to detect corrupted information. Further error correction can then be performed by error correction tools at the same layer.

Error Rate – The ratio of the number of bits incorrectly transmitted to the total number of bits of information received.

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) – Data stream for video, audio or data. Preliminary stage to PES.

ESAC (Economics and Statistics Advisory Committee)

ESCR (Elementary Stream Clock Rate) – A time stamp in PES stream from which decoders may derive timing.

ESPRIT (European Strategic Program for Research and Development in Information Technology) – A funding program to develop information technology in the European Economic Communities.

Essence – The actual program (audio, video and/or data) without metadata. Essence could also be graphics, telemetry, photographs or other information.

Essence Media or Essence Data – Refers to the actual bits and bytes that represent the sound and picture. It is frequently (And incorrectly) used by IT folks to describe a cassette, DVD, or streaming file containing audio, video, and graphics elements.

Ethernet (IEEE 802.3) – a) A type of high-speed network for interconnecting computing devices. Ethernet can be either 10 or 100 Mbps (Fast Ethernet). Ethernet is a trademark of Xerox Corporation, Inc. **b)** A type of local area network that enables real-time communication between machines connected directly together through cables. A widely implemented network from which the IEEE 802.3 standard for contention networks was developed, Ethernet uses a bus topology (configuration) and relies on the form of access known as CSMA/CD to regulate traffic on the main communication line. Network nodes are connected by coaxial cable (in either of two varieties) or by twisted-pair wiring.

ETR 290 – ETSI recommendation priorities for monitoring MPEG-2/DVB transport streams.

ETS (European Telecommunications Standards) – Standard issued by the ETSI.

ETS (Expiration Time Stamp) – Supports the notion of object persistence. An object, after it is presented, is saved at the decoder (cache) until a time given by ETS. Such an object can be used multiple times before ETS runs out. A Persistent Object (PO) with an expired ETS is no longer available to the decoder.

ETSI (European Telecommunication Standard Institute) – A European forum for standardization with participation of major players in the telecommunications industry. ETSI replaced the CEPT in 1988 with the objective of making the telecommunications standards needed for the implementation of the common market in Europe. ETSI has now become a leading body on all telecommunications standards, however, and provides a strong input to international bodies. This being so, the ETSI focuses on standards that involve interactions between public and private networks, and specifies the framework of activities that form the telecommunications infrastructure. ETSI produces standards through a number of technical committees, and utilizes project teams composed of paid experts to produce drafts of standards. The standards produced are called European Telecommunications Standards (ETS) or Interim European Telecommunications Standards (I-ETS).

ETSI EN 300 163 – This specification defines NICAM 728 digital audio for PAL.

ETSI EN 300 294 – Defines the widescreen signaling (WSS) information for PAL video signals. For (B, D, G, H, I) PAL systems, WSS may be present on line 23.

ETSI EN 300 421 – This is the DVB-S specification.

ETSI EN 300 429 – This is the DVB-C specification.

ETSI EN 300 744 – This is the DVB-T specification.

ETSI EN 300 775 – This is the specification for the carriage of Vertical Blanking Information (VBI) data in DVB bitstreams.

ETSI ETR 154 – This specification defines the basic MPEG audio and video parameters for DVB applications.

ETSI ETS 300 231 – This specification defines information sent during the vertical blanking interval using PAL teletext (ETSI ETS 300 706) to control VCRs in Europe (PDC).

ETSI ETS 300 706 – This is the enhanced PAL teletext specification.

E**TSI ETS 300 707 –** This specification covers Electronic Program Guides (EPG) sent using PAL teletext (ETSI ENTS 300 706).

ETSI ETS 300 708 – This specification defines data transmission using PAL teletext (ETSI ETS 300 706).

ETSI ETS 300 731 – Defines the PALplus standard, allowing the transmission of 16:9 programs over normal PAL transmission systems.

ETSI ETS 300 732 – Defines the ghost cancellation reference (GCR) signal for PAL.

ETSI ETS 300 743 – This is the DVB subtitling specification.

ETT – See Extended Text Table.

ETV (Educational Television) – A term applied to any television program or equipment related to some form of education or instruction.

Eureka – A massive European research effort, sometimes called the European version of Star Wars, embracing many separate R&D projects, including semiconductors, telecommunications, and computers. The Eureka EU-95 project is about ATV systems for 625 scanning line/50 field per second countries.

EuroDAB – This is an organization formed through the EBU with the purpose of paving the way for DAB in Europe. The group, which holds more than 100 broadcasters, manufacturers, regulators, etc., looks into services to be offered, identified features and applications, it researches data services and receiver implementation, and monitors national regulations. Finally, the group is analyzing satellite DAB projects.

Europe – A geographic region that led the opposition to the ATSC proposal when it was presented to the CCIR as a proposed worldwide standard and is developing its own ATV systems. European television currently has 625 scanning lines and 50 field per second as opposed to NTSC's 525/59.94.

Evaluator – Equipment that evaluates physical and magnetic quality of tape, usually provided as an adjunct to a winder/cleaner. In contrast to a certifier, it does not stop when it detects an error.

E-Value – The difference in inches between the radii of the outside layer of tape in a roll and the outside edge of the reel flange.

Even Field – In a 2:1 interlaced system, the field that begins with a broad pulse halfway between two line syncs. For NTSC that is line 262-1/2 – 525, for PAL that is line 312-1/2 – 625.

Even Number – The number of scanning lines per frame possible in a progressively scanned television system. An interlaced scan system must use an odd number of lines so that sequential fields will be displaced by one scanning line.

Event – a) An event is defined as a collection of elementary streams with a common time base, an associated start time, and an associated end time. **b)** A grouping of elementary broadcast data streams with a defined start and end time belonging to a common service, e.g., first half of a football match, News Flash, first part of an entertainment show.

Event Number – Number assigned by the system (or editor) to each edit that is recorded in the EDL.

EVM (Error Vector Magnitude)

Exabyte – An 8 mm data tape format. Popular for storing graphics files due to its low cost and high capacity (commonly 8 GB, but new models hold up to 40 GB). Exabyte is also the number of bytes that comes after petabyte.

Excursion – The amplitude difference between two levels.

Execute (Cycle) – Last cycle of instruction execution. During this time, the instruction operation is performed.

Execution Time – Time required for the execution of an instruction.

Exif (Exchangeable Image Format) – A file format used in digital cameras.

Exit – The point at which an edit will end (normally displayed by time code).

Expander – A device which increases the dynamic range of a signal by either reducing the level of soft signals or increasing the level of loud signals when the input is above or below a certain threshold level.

Expansion – An undesired increase in amplitude of a portion of the composite video signal relative to that of another portion. Also, a greater than proportional change in the output of a circuit for a change in input level. For example, expansion of the sync pulse means an increase in the percentage of sync during transmission.

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.

Explicit Scene Description – The representation of the composition information based on a parametric description (syntax and semantic) of the spatio-temporal relationships between audiovisual objects, as opposed to Implicit Scene Description.

Exponent – Power of ten by which a number is multiplied, used in floating point representation. For example, the exponent in the decimal number 0.9873 x 107 is 7.

Export – To use NFS software to make all or part of your file system available to other users and systems on the network.

Exposure Sheet – In a piece of animation there are hundreds of frames. Typically, they are organized on an exposure sheet. The sheet describes, for each piece of artwork used, on which frame the art is first used, what happens to it (on a frame by frame basis) while it is used, and on which frame it disappears. Also noted on the sheet, for each frame, are any changes in the animation system (animation table, camera, lights, etc.). Exposure sheets on the PictureMaker are created using the SEQ program, and are organized somewhat differently than traditional sheets, in order to best use the computer. Each level (or layer, or plane) can be one of three types: Image (a file of pixel values), object (a 3D database and animation path), and explicit command (a PictureMaker command mode command). Each level specifies a beginning from and duration (ending frame), and the computer keeps track of all levels with respect to their overlaps in both time and space.

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.

Extended Text Table (ETT) – The optional ATSC PSIP table that carries long descriptions of events and channels. There are two types of ETTs: Channel ETTs, which carry channel descriptions, and Event ETTs, which carry event descriptions.

Extended/Enhanced Definition Television (EDTV) – a) Extended (or Enhanced) Definition Television is a proposed intermediate television system for evolution to full HDTV that offers picture quality substantially improved over conventional 525-line or 625-line receivers, by employing techniques at the transmitter and at the receiver that are transparent to (and cause no visible quality degradation to) existing 525-line or 625-line receivers. One example of EDTV is the improved separation of luminance and color components by pre-combing the signals prior to transmission. Also see Improved Definition Television. **b)** Specifically a video format with sampling frequencies 18 MHz (Y), 4.5 MHz (C), and resolution 960 pixels by 576 lines (Y), 480 pixels by 288 lines (C).

Extensibility – A property of a system, format, or standard that allows changes in performance or format within a common framework, while retaining partial or complete compatibility among system that belong to the common framework.

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

External Device – In computer systems, any piece of hardware that is attached to the workstation with a cable.

External Key Input – Extra key inputs that may be accessed by keyboard that do not appear on the bus rows. Traditionally these inputs are used only for luminance keys, such as simple character generators or titling cameras, however, they are not limited to this on Ampex switchers. These are sources 9 and 0 on 4100 series switchers, and 31 and 32 on AVC switchers.

External Key Processor – See Processed External Keys.

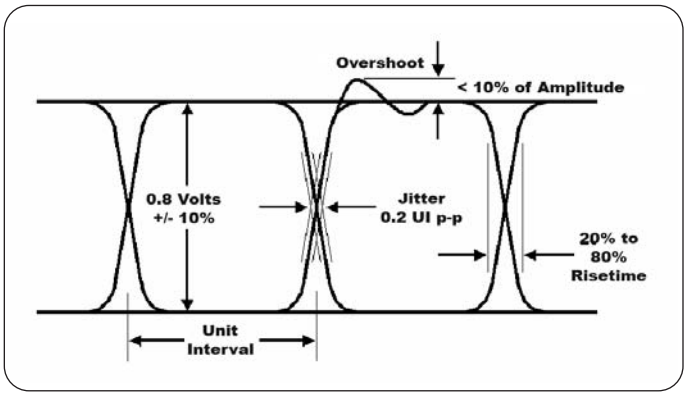
External Synchronization – A means of ensuring that all equipment is synchronized to the one source.

Extract – To remove a selected area from an edited sequence and close the resulting gap in the sequence.

Extrapolation – A mode that defines the shape of an animation curve before the first and after the last control points on the curve. Extrapolation affects the animation before the first keyframe and after the last keyframe. Extrapolation is only apparent if there are frames before and after the keyframes.

Extrusion – The next stop in creating a boundary rep solid is to "extrude" the silhouette. Extrusion (or sweeping) is a method of dragging a polygon through space in order to define a solid. There are typically two kinds of extrusion: translational and rotational.

Eye Diagram – A means to display the health of the Physical Layer of the digital data. It is formed by overlaying segments of the sampled digital signal in much the same way as a waveform monitor overlays lines of a video signal to produce the familiar line display. By providing enough of the sample digital segments the eye display is produced and should ideally conform to the digital standards for the appropriate format.



Eye Pattern – Waveform monitor pattern produced by random waves introduced to verify the ability to test for the presence or absence of pulses in a digital system.

Eye Tracking – The process by means of which eyes follow a person or object across a television screen. Many ATV techniques take advantage of the fact that human vision cannot simultaneously demand high spatial resolution and high temporal resolution to reduce the amount of spatial resolution transmitted for moving objects. However, when the eyes track such an object, its image is stationary on the retina, and the visual system can demand as much resolution as it would for a truly stationary object. See also Dynamic Resolution.

Eyedropper – A tool for taking a color from a screen image and using that color for text or graphics.

▶ F

Fade – Fading is a method of switching from one video source to another. Next time you watch a TV program (or a movie), pay extra attention when the scene is about to end and go on to another. The scene fades to black, then a fade from black to another scene occurs. Fading between scenes without going to black is called a dissolve. One way to do a fade is to use an alpha mixer.

Fade to Black – a) This is a video editing term that describes switching from one video source to a black level or from black to a video signal. This is commonly called a "fade to black" or "fade from black". **b)** The picture luminance is reduced until the screen is black.

Fader – The console control which allows an operator to perform manual dissolves, fades and wipes.

Fader Bar – A vertical slide controller on audio and video equipment.

Fall Time – Usually measured from the 10% to the 90% amplitude points of a negative going transition. See Rise Time.

Falling Edge – High-to-low logic or analog transition.

Fan-In – Electrical load presented by an input. Usually expressed as the number of equivalent standard input loads.

Fan-Out – Electrical load that an output can drive. Usually expressed as the number of inputs that can be driven.

FAP (Face Animation Parameters) – Represents a complete set of facial actions; allows representation of most of the natural facial expressions.

FAPU (Facial Animation Parameter Units) – The amount of displacement described by a FAP is expressed in specific measurement units, called Facial Animation Parameter Units (FAPU), which represent fractions of key facial distances. Rotations are instead described as fractions of a radian.

Faroudja – Yves Faroudja and Faroudja Laboratories. First to market an advanced NTSC encoder with pre-combing; proponent of the Super-NTSC ATV system and of a 1050 scanning line (900 active line), progressive scan, 29.97 frame per second, 1.61:1 aspect ratio HDEP system.

FAS (Frame Alignment Signal) – The distinctive signal inserted in every frame or once in frames that always occupies the same relative position within the frame and is used to establish and maintain frame alignment, i.e. synchronization.

Fast Forward – The provision on a tape recorder permitting tape to be run rapidly through it in normal play direction, usually for search purposes.

Fast Forward Playback – The process of displaying a sequence, or parts of a sequence, of pictures in display-order faster than real-time.

Fast Reverse Playback – The process of displaying the picture sequence in the reverse of display order faster than real-time.

Fast-Page Mode – A read or write mode of DRAMs characterized by a decrease in cycle time of about 2-3 times and a corresponding increase in performance. The data accessed in Fast-Page Mode cycles must be adjacent in memory. See EDO.

FAT (File Allocation Table) – A file system used on MS-DOS and Windows computers.

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

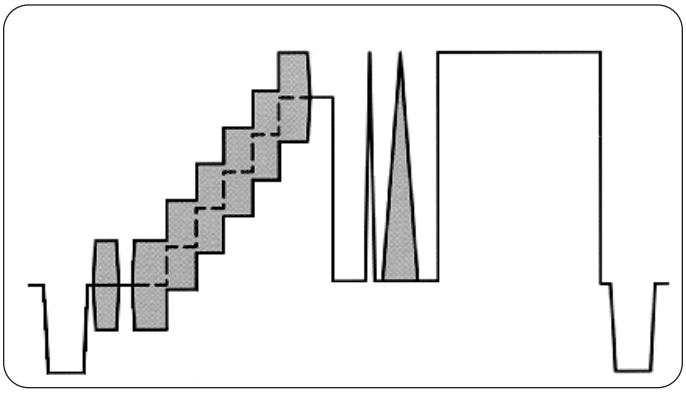
FBA (Face and Body Animation) – A collection of nodes in a scene graph which are animated by the FAB (Face and Body Animation) object bitstream.

FC-AL (Fiber Channel-Arbitrated Loop) – Architecture used to maintain high data transfer rates over long distances. With FC-AL storage arrays can be separated by as much as 20 kilometers, connected by only one non-amplified Fibre Channel fiber optic link. In the dual-loop architecture, data transfer rates can reach 200 Mbps. Another advantage is increased fault tolerance. In the unlikely event of a drive failure, port bypass circuits single out each failed drive and quickly route around it, with no limitation on the number of drives that can be bypassed.

FCC (Federal Communications Commission) – a) The government agency responsible for (among other things) the regulation of the electromagnetic spectrum utilization in the U.S., and the body that licenses radio and television broadcast stations. The FCC is an independent government agency, which answers directly to Congress. **b)** The FCC rules and regulations constitute mandatory standards for broadcasters, CATV operators, transmission organizations, and others. See also ACATS.

FCC 73.699 – Federal Communications Commission (FCC) NTSC video signal specifications standard.

FCC Composite Test Signal



FDC (Final Committee Draft) – This is the final public form of the Committee Draft of a proposed international standard, and must be identified as such before being submitted for a four-month approval ballot amongst the Participating Member Bodies of the Subcommittee.

F-Connector – A video connector characterized by a single metal wire. F-connectors may be either push-on or screw-post.

FDDI (Fiber 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. This configuration provides a high level of fault tolerance by creating multiple connection paths between nodes, connections can be established even if a ring is broken.

FDIS (Final Draft International Standard) – This is the final form of a proposed standard before it is adopted as an International Standard. An approved Final Committee Draft, modified as necessary to accommodate comments submitted by National Bodies during, or after, the approval ballot, must first be registered as a Final Draft International Standard, and then submitted to a two-month letter ballot amongst Participating Member Bodies of JTC1.

FDM (Frequency Division Multiplex) – A technology that transmits multiple signals simultaneously over a single transmission path, such as a cable or wireless system. Each signal travels within its own unique frequency range (carrier), which is modulated by the data (text, voice, video, etc.).

FDP (Facial Definition Parameters)

Feathering – A tool that tapers the values around edges of binary alpha mask for composition with the background.

Feature Connector – An expansion connector on the VGA that can accept or drive video signals to or from the VGA. This is used in applications involving video overlay. This is also called VESA Pass-Through Connector.

FEC (Forward Error Correction) – a) A system in which redundancy is added to the message so that errors can be corrected dynamically at the receiver. **b)** Error control bits added to useful data in the QAM/QPSK modulator.

Feed – The transmission of a video signal from point to point.

Feed Reel – Also called "stock", "supply" or "storage" reel. The reel on a tape recorder from which tape unwinds as the machine records or plays.

Feedback – a) Information from one or more outputs to be used as inputs in a control loop. **b)** A loop caused by audio or video signal being fed back into itself. In video the effect is caused when a camera is directed at its receiving monitor. In audio the effect, manifested as an echo or squeal, is caused when a microphone is aimed at a speaker. **c)** A loud squeal or howl caused when the sound from a loudspeaker is picked up by a nearby microphone and reamplified. Also caused when the output of a tape recorder is fed back into the record circuit.

Female Connector – A connector that has indentations or holes into which you plug a male connector. An example of a female connector is an electrical wall outlet that accepts and electrical plug.

Ferrichrome – A relatively recent word describing the technique of dual coating with both a layer of gamma ferric oxide and a layer of chromium dioxide. An intermediate level bias position used only for ferrichrome tapes.

Fetch – Reading an instruction from memory.

FF – See Full Field.

FFT (Fast Fourier Transform) – A mathematical means of converting time domain information to frequency domain information.

FGS (Fine Grain Scalability) – A tool that allows small quality steps by adding or deleting layers of extra information. It is useful in a number of environments, notably for streaming purposes but also for dynamic (statistical) multiplexing of pre-encoded content in broadcast environments.

F_H – Line frequency (horizontal) 15,734 lines/sec Hz for NTSC (525 lines x 29.97 Hz).

Fiber Bundle – A group of parallel optical fibers contained within a common jacket. A bundle may contain from just a few to several hundred fibers.

Fiber Channel – See Fibre Channel.

Fiber Optics – See Optical Fiber.

Fiber-Optic Cable – "Wires" made of glass fiber used to transmit video, audio, voice or data providing vastly wider bandwidth than standard coaxial cable.

Fibre Channel – A high speed data link planned to run up to 2 Gbps on a fiber optic cable. A number of manufacturers are developing products to utilize the Fiber Channel-Arbitrated Loop (FC-AL) serial storage interface at 1 Gbps so that storage devices such as hard disks can be connected. Supports signaling rates from 132.8 Mbps to 1,062.5 Mbps, over a mixture of physical media including optical fiber, video coax, miniature coax, and shielded twisted pair wiring. The standard supports data transmission and framing protocols for the most popular channel and network standards including SCSI, HIPPI, Ethernet, Internet Protocol, and ATM.

Field – a) In interlaced scan systems, the information for one picture is divided up into two fields. Each field contains one-half of the lines required to produce the entire picture. Adjacent lines in the picture are in alternate fields. **b)** Half of the horizontal lines (262.5 in NTSC and 312.5 in PAL) needed to create a complete picture. **c)** One complete vertical scan of an image. In a progressive scanning system, all of the scanning lines comprising a frame also comprise a field. **d)** An area in a window in which you can type text. **e)** A television picture is produced by scanning the TV screen with an electron beam. One complete scan of the screen is called a field. Two fields are required to make a complete picture, which is called a frame. The duration of a field is approximately 1/60 of a second in NTSC and 1/50 or 1/60 of a second in PAL. **f)** One half of a complete interlaced video picture (frame), containing all the odd or even scanning lines of the picture.

Field Alias – An alias caused by interlaced scanning. See also Interlace Artifacts.

Field Blanking – Refers to the part of the signal at the end of each field that make the vertical retrace invisible. Also called vertical blanking.

Field DCT Coding – Discrete cosine transform coding is where every block consists of lines from one field. The chrominance blocks in the 4:2:0 format must never be coded by using field DCT coding, but it is allowed to use field based prediction for this type of block.

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. 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 the disc's still frames.

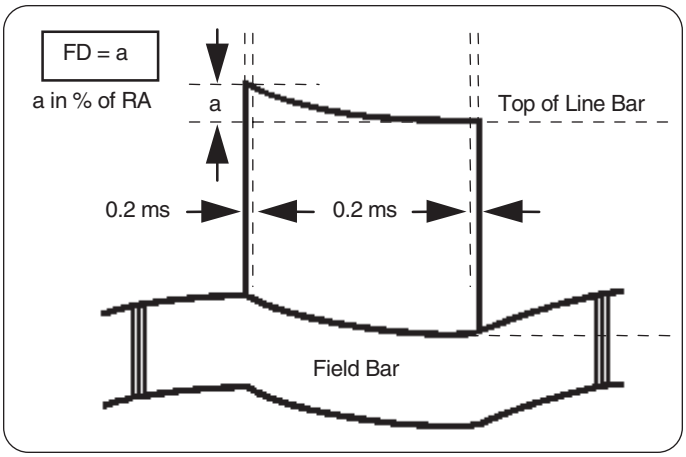
Field Frequency – The rate at which one complete field is scanned, normally 59.94 time a second in NTSC or 50 times a second in PAL.

Field Period – The reciprocal of twice the frame rate.

Field Picture – A picture in which the two fields in a frame are coded independently. Field pictures always come in sets of two fields, which are called top field and bottom field, respectively. When the first field is coded as a P- or a B-picture, the second picture must be coded in the same manner; however, if the first field is coded as an I-picture, the second field may be coded as either an I-picture or a P-picture (that is predicted from the first field).

Field Rate – Number of fields per second.

Field Time Linear Distortions – Distortions involve signals in the 64 µsec to 16 msec range. Field time distortions cause field-rate tilt in video signals. The error is expressed in IRE or as a percentage of a reference amplitude which is generally the amplitude at the center of the line bar.



These distortions will cause top to bottom brightness inaccuracies in large objects in the picture. These distortions can be measured with either a window signal or a field square wave. See Linear Distortions.

Field Time Waveform Distortions – See Field Time Linear Distortions.

Field, Depth of – a) The range of distance in subject space within which a lens (or a system) provides an image that reproduces detail with an acceptably small circle of confusion (acceptable focus) usually small enough for subjective evaluation as a "point", defines the depth of field. Tables are calculated for lenses as a function of optical aperture and the subject distance at which they are focused. Regrettably, these calculations are strictly geometric (ignoring the possibility of diffraction effects, of all optical aberrations, and of possible differing contributions to focal length from different annuli of the optical system). Thus, the tables are at times overly optimistic. **b)** Depth of field for a given imaging system decreases with increasing optical aperture of that system, and decreases as the distance to the subject decreases. A "maximum acceptable" diameter for the "circle of confusion" may depend upon the resolution capabilities of the light-sensitive receptor (electronic or photographic) and of the system within which it is functioning. Quantitative measurements for actual imaging systems may be made on an optical bench. Practical determinations are made from subjective examination of the actual images in the system of interest.

FIFO (First-In-First-Out) – a) A memory structure in which data is entered at one end and removed from the other. A FIFO is used as a buffer to connect two devices that operate asynchronously. **b)** A storage device (parallel shift register) which operates as a Turing machine to buffer asynchronous data where the first data stored is the first data read out. FIFOs are used to store video and act as "rubber-band" type buffers to keep a steady video stream where memory and system clock speeds do not match. FIFOs have less delays than standard shift registers as input and output are controlled by separate clocks.

FIG (Facial Animation Parameters Interpolation Graph)

Figure-8 Microphone – A microphone (usually a ribbon type) whose sensitivity is greatest to front and rear, and weakest to both sides.

File – A container in which you store information such as text, programs, or images.

File Set – A collection of files and directories.

File System – A hierarchy of directories and files. Directories contain other directories and files; files cannot contain directories. The root (/) directory is at the top of the hierarchy. See also Format.

Fill – The video information that replaces a "hole" (video information) cut in the video picture by the key signal.

Fill (Insert) Video – A video signal which replaces a "hole" (video information) cut in background video by a key source.

Fill Bus – A separate bus or buses from which fill videos can be selected independently from the key source cutting the hole.

Fill Light – Fill lights, commonly referred to as "scoops", provide a soft-edged field of light used to provide additional subject illumination to reduce harsh shadows or areas not highlighted by the key light.

Filled Clip – A segment of a sequence that contains no audio or video information. Filler can be added to the source monitor (or pop-up monitor) and edited into a sequence. See also Filler Proxy.

Filled Key – A key effect in which the key source image is different from the foreground image. Areas not keyed (that is, not made transparent) in the key source image are filled with the corresponding areas of the foreground image.

Filler Proxy – The result of a composition specifying media to be played for the filler clips in each track.

Film Chain – a) Projectors, multiplexers and cameras, connected for the purpose of transferring film to video. **b)** A device that transfers a film image to a video image. It is also know as a Telecine chain.

Film Loop – A piece of file, quite short, which is to be played repeatedly.

Film Recorder – A device for converting digital data into film output. Continuous tone recorders produce color photographs as transparencies, prints or negatives.

Film Timecode – Timecode added to the film negative during the film shoot via a film timecode generator. Film timecode numbers are synced to the film key numbers on the dailies during the telecine transfer process. A special key link reader is required for viewing the film timecode.

Filter – A device used to remove or pass certain frequencies from a signal. Low pass filters pass the low frequency content of a signal while high pass filters pass the high frequency content. A bandpass filter passes frequencies within a certain "band".

Filter Artifacts – Distortions introduced by filters. The most common visual artifacts introduced by filters are reduced resolution and ringing.

Filter, Brick Wall – A low-pass filter with a steep cut-off (such as 20 dB/octave or greater), such that a negligible amount of higher frequency information passes. The filter typically has uniform group delay.

Filter, Gaussian – A low-pass filter providing a gradual attenuation of the higher frequencies. Strictly the attenuation should follow the curve V=e^(-af^2). But the term is also applied to attenuation functions that only qualitatively resemble the precise power function.

Filter, Optical – In addition to the familiar optical filters for modifying spectral energy distribution, and thereby color rendition, optical filters are also produced as low-pass filters for spatial detail in an optical image, eliminating high-frequency information that would exceed the Nyquist limit of the system and produce excessive aliasing. Many of these filters are cut from optically birefringent crystals and function by providing multiple images slightly displaced one form another so that fine detail is blurred (i.e., low-pass filtered).

Filterbank – A set of bandpass filters covering the entire media frequency range.

Filtering – A process used in both analog and digital image processing to reduce bandwidth. Filters can be designed to remove information content such as high or low frequencies, for example, or to average adjacent pixels, creating a new value from two or more pixels.

Finite Impulse Response Filter (FIR) – A digital filter that is in general, better than analog filters but also more complex and expensive. Some specialized filter functions can only be accomplished using a FIR.

FIP (Forward Interaction Path)

FIR – See Finite Impulse Response Filter.

FireWire (IEEE P1394) – FireWire is a special high-speed bus standard capable of over 100 megabits/sec sustained data rate.

Firmware – Program stored in ROM. Normally, firmware designates any ROM-implemented program.

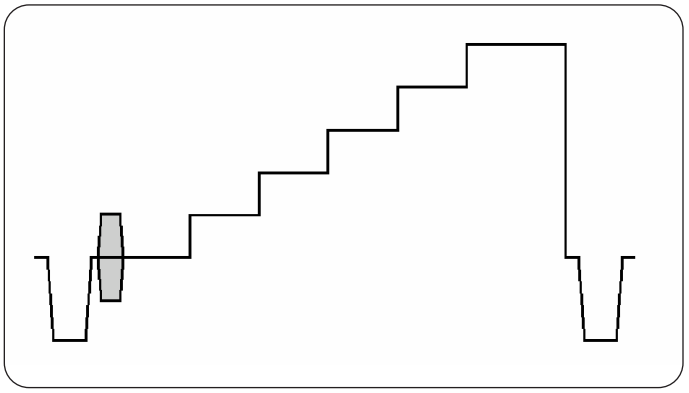
First Play PGC – This Program Chain (PGC) is described in the Video Manager Information table, and has no corresponding video objects (VOB). The First Play PGC is executed at initial access, e.g. just after disc loading.

First-Frame Analysis – A transparency technique wherein the first frame of the video file is a dummy frame that supplies the color or range of colors to be rendered as transparent: the color of the chroma-key background, for example. See Transparency, Transparency Frame.

Fit to Fill – An insert edit where an incoming source clip replaces an existing segment (or gap) in the record clip. A fit to fill edit functions like a swap shot edit except that the edit sequence does not ripple. If the source clip has a different length than the segment it replaces, the source clip is shortened or lengthened proportionally to fit the duration of the replaced segment.

FITS (Functional Interpolating Transformation System) – A format that contains all data used to design and assemble extremely large files in a small, efficient mathematical structure.

Five-Step Staircase – Test signal commonly used to check luminance gain linearity.



Fixed Focal Length Lens – A lens with a predetermined fixed focal length, a focusing control and a choice of iris functions.

Fixed Rate – Information flow at a constant volume over time. See CBR.

Fixed-Point Representation – Number representation in which the decimal point is assumed to be in a fixed position.

Flag – a) A variable which can take one of only two values. **b)** Information bit that indicates some form of demarcation has been reached, such as overflow or carry. Also an indicator of special conditions such as interrupts.

Flags – Menu functions other than the X, Y or Z parameters which turn on/off or enable a selection of one or more system conditions.

Flanging – Another name for phasing. Originally, the method of phasing where phase was varied by resting your thumb on the flanges of the reel to slow it down.

Flash – Momentary interference to the picture of a duration of approximately one field or less, and of sufficient magnitude to totally distort the picture information. In general, this term is used alone when the impairment is of such short duration that the basic impairment cannot be recognized. Sometimes called "Hit".

Flash Analog to Digital Converter – A high speed digitizing device based on a bank of analog comparators. The analog value to be digitized is the input to one side of the comparators bank. The other comparators input is tied to a tap of a resistor ladder, with each comparator tied to its own tap. The input voltage at each comparators will be somewhere between the top and bottom voltages of the resistor ladder. The comparators output a high or a low based on the comparison of the input voltage to the resistor ladder voltage. This string of 1s and 0s are converted to the binary number.

Flash Frame – After a long, complex piece is edited, small bits of video might be accidentally left in a sequence. When the Timeline is zoomed to 100 percent, these small, unwanted, pieces might not be visible. An editor can find these bits using the Find Flash Frame command.

Flash Memory – Nonvolatile, digital storage. Flash memory has slower access than SRAM or DRAM.

FlashPix – A multi-resolution image format in which the image is stored as a series of independent arrays. Developed by Kodak, Hewlett-Packard, Live Picture, Inc. and Microsoft and introduced in June 1996.

Flat Field – As used herein, the entire area viewed by a television camera with the viewed area being uniformly white or any single specified color or any shade of gray.

Flat Shading – A polygon rendered so that its interior pixels are all the same color has been rendered with "flat" shading. An object represented by polygons that is rendered with flat shading will look distinctly faceted. No highlights or reflections are visible.

Flatten – The process of converting a Macintosh file into a self-contained, single-forked file so that it is compatible with Windows environment. See Self-Contained, Single-Forked.

Flexibility Layer – The MPEG-4 Systems Layer that specifies how some parts of the MPEG-4 terminal can be configured or downloaded. Two modes are identified in this layer, the non-flexible mode and the flexible mode.

Flexible Mode – The configuration of an MPEG-4 terminal in which the capability to alter parameters or algorithms for the processing of audio-visual objects is achieved by the transmission of new classes or scripts.

FlexMux Channel (FMC) – A label to differentiate between data belonging to different constituent streams within one FlexMux stream.

FlexMux Entity – An instance of the MPEG-4 system resource that processes FlexMux Protocol Data Units (PDUs) associated to one FlexMux stream.

FlexMux Layer (FML) – A logical MPEG-4 Systems Layer between the Elementary Stream Layer and the TransMux Layer used to interleave one or more elementary streams, packetized in Adaption Layer protocol data unit, into one FlexMux stream.

FlexMux Packet – The smallest data entity managed by the FlexMux tool consisting of a header and a payload

FlexMux Protocol Data Unit (FlexMux-PDU) – The smallest protocol unit of a FlexMux stream exchanged between peer FlexMux entities. It consists of FlexMux-PDU Header and FlexMux-PDU Payload. It carries data from one or more FlexMux channel(s).

FlexMux Protocol Data Unit Header (FlexMux-PDU Header) – Information preceding the FlexMux-PDU payload. It identifies the FlexMux channel(s) to which the payload of this FlexMux-PDU belongs.

FlexMux Stream – A sequence of FlexMux packets associated with one or more FlexMux channels flowing through one TransMux channel.

Flicker – a) Flicker occurs when the refresh rate of the video is too low and the light level on the display begins to decrease before new information is written to the screen to maintain the light level. To prevent the human eye from seeing flicker, the screen refresh rate needs to be at least 24 frames per second. **b)** A rapid visible change in brightness, not part of the original scene. See also Flicker Frequency, Fusion Frequency, Judder, Large-Area Flicker, and Twitter.

Flicker Filter – Video data from a VGA is not interlaced. This data must be converted into interlaced format for display on a TV. If every second line is discarded of the non-interlaced data, flicker may occur if, for example, video information is contained in just one noninterlaced line. Flicker will also be perceptible at the top and bottom of multilane objects. A flicker filter overcomes these problems in computing a weighted average of two or three adjacent lines (noninterlaced) for each line of output (interlaced).

Flicker Frequency – The minimum rate of change of brightness at which flicker is no longer visible. The flicker frequency increases with brightness and with the amount of the visual field being stimulated. In a recent study, a still image flashed on and off for equal amounts of time was found to have a flicker frequency of 60 flashes per second at a brightness of 40 foot lamberts (fL) and 70 at 500. Television sets generally range around 100 fL in peak brightness (though some new ones claim over 700). The SMPTE recommends 16 fL for movie theater screens (though this is measured without film, which reduces the actual scene brightness by at least 50 percent). One reason for interlaced scanning is to increase television's flashing pictures to the flicker frequency, without increasing bandwidth.

Flip – Special effect in which the picture is either horizontally or vertically reversed.

Floating – Logic node that has no active outputs. Three-state bus lines, such as data bus lines, float when no devices are enabled.

Floating-Point Representation – Technique used to represent a large range of numbers, using a mantissa and an exponent. The precision of the representation is limited by the number of bits allocated to the mantissa. See Mantissa and Exponent.

Floppy Disk – Mass-storage device that uses a flexible (floppy) diskette to record information. See Disk.

Flowchart or Flow Diagram – Graphical representation of program logic. Flowcharts enable the designer to visualize a procedure. A complete flowchart leads directly to the final code.

FLSD (Fixed Linear Spline Data) – The different modes used to animate a value, for example, position, color, or rotation.

Fluid Head – Refers to a tripod mount that contains lubricating fluid which decreases friction and enables smooth camera movement.

Flutter – Distortion which occurs in sound reproduction as a result of undesired speed variations during recording or reproducing. Flutter occurring at frequencies below approximately 6 Hz is termed "wow".

Flux – Magnetic field generated by a record head, stored on magnetic tape, and picked up by the playback head. Also the magnetic field that exists between the poles of a magnet.

Flux Transition – A 180 degree change in the flux pattern of a magnetic medium brought about by the reversal of the magnetic poles within the medium.

Flux Transition Density – Number of flux transitions per track length unit.

Fly-Back – See Horizontal Retrace.

Flying Erase Head – The erase head mounted on the spinning (flying) video head drum. Facilitates smooth, seamless edits whenever the camcorder recording begins. Without a flying erase head, a video "glitch" may occur at scene transitions.

Flying Head – A video head that engages when the video deck is on "pause", providing a clear still-frame image.

Fly-Through – A fly-through is a type of animation where a moving observer flies through a seemingly stationary world.

FM – See Frequency Modulation.

FM Recording – The data signal is used to modulate the frequency of a "carrier" having a frequency much higher than any spectral component of the data signal. Permits the recording of DC or very low signal frequencies.

FM-FM – Dual carrier FM coded discrete stereo transmissions, analogue. Can be used for bi-lingual operation under user selection, but no auto-selection is available. Audio characteristics better than standard mono soundtrack.

FMV – See Full Motion Video.

F-Number – In lenses with adjustable irises, the maximum iris opening is expressed as a ratio (focal length of the lens)/(maximum diameter of aperture). This maximum iris will be engraved on the front ring of the lens.

Focal Length – The distance between the secondary principal point in the lens and the plane of the imaging device. The longer the focal length, the narrower is the angle of view.

Focus – Adjustment made to the focal length of the lens, designed to create a sharper, more defined picture.

Focusing Control – A means of adjusting the lens to allow objects at various distances from the camera to be sharply defined.

Foldover – Tape that has folded over resulting in the oxide surface facing away from the heads.

Foley – Background sounds added during audio sweetening to heighten realism, e.g. footsteps, bird calls, heavy breathing, short gasps, etc.

Following (or Trailing) Blacks – A term used to describe a picture condition in which the edge following a white object is overshaded toward black. The object appears to have a trailing black border. Also called "trailing reversal".

Following (or Trailing) Whites – A term used to describe a picture condition in which the edge following a black or dark gray object is overshaded toward white. The object appears to have a trailing white border. Also called "trailing reversal".

Font – A style of type. Many character generators offer the user a menu of several fonts.

Foot Candles – A measure of the amount of light falling on an object (its illumination). This is a measure only of the light energy that can be seen by the human eye (becoming an obsolete unit; replaced by the Lux).

1 foot candle = 1 lumen per square foot

Foot Lamberts – A measurement of the brightness of an object. If 100 foot candles are illuminating a 60% white chip, then its brightness will be 60 foot lamberts, regardless of viewing distance. Again, remember that brightness is measured over the same energy response of a human eye (becoming obsolete unit; replaced by the Nit).

Footage Encoder Time Code Generator – An electronic device which takes the input from a reader of keycode numbers, decodes this information and correlates the numbers with the SMPTE time code it generates. These data, along with 3:2 pull-down status of the transfer, footage count, and audio time code (if applicable) are made available for window burn-ins, VITC-LTC recording and output to a computer.

Foot-Candela – An illumination light unit used mostly in American CCTV terminology. It equals ten times (more precisely, 9.29) of the illumination value in luxes.

Footprint – Area on earth within which a satellite's signal can be received.

Forbidden – The term forbidden when used in the clauses defining the coded bit stream indicates that the value shall never be used. This is usually to avoid emulation of start codes.

Forbidden Value – An excluded value in the coded bit stream. A value that is not allowed to appear in the bit stream.

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

Forced Display – A DVD feature that forces the display of a sub-picture regardless of whether or not the user wanted the sub-picture to be displayed. This would be used, for instance, in an English movie in which there were non-English words spoken and it was desired that a translation be provided even if the subtitle system was turned off.

Forced Selected Button – Menu button that is automatically selected when the menu is displayed.

Forced Updating – a) The process by which macroblocks are intra coded from time-to-time to ensure that mismatch errors between the inverse DCT processes in encoders and decoders cannot build up excessively. **b)** The recurrent use of I-coding to avoid build-up of errors between the inverse DCT processes in encoders and decoders.

Foreground (FGND) – May be thought of as the front layer of video in a picture. Also used to describe the insert video (on 4100 series) of a key.

Form – A window that contains buttons that you must click and/or editable fields that you must fill in.

Format – a) The configuration of signals used for interconnecting equipment in a specified system. Different formats may use different signal composition, reference pulses, etc. A variety of formats are used to record video. They vary by tape width (8 mm, 1/2", 3/4", 1"), signal form

(composite, Y/C, component), data storage type (analog or digital) and signal standard (PAL, NTSC, SECAM). **b)** For data storage media (hard disks, floppies, etc.), the process of initializing the media prior to use. Formatting effectively deletes any data that was previously on the media. See Format Disk.

Format Conversion – The process of both encoding/decoding and resampling of digital rates to change a digital signal from one format to another.

Format Converter – A device that allows the reformatting of a digital data stream originating from one sampling structure (lines per frame, pixels per line) into a digital data stream of another sampling structure for the purposes of recording or passing the original data stream through distribution devices designed to accommodate the latter structure. Since the data still represents the original sampling structure, this is not the same as standards conversion.

Format Disk – The process of preparing a disk for data storage by determining where data is to be placed and how it is to be arranged on disk.

Formatting – The transfer and editing of material to form a complete program, including any of the following: countdown, test patterns, bars and tone, titles, credits, logos, space for commercial, and so forth.

Forward Compatibility – A decoder is able to decode a bit stream coming from an encoder of a previous generation. A new coding standard is forward compatible with an existing coding standard if new decoders (designed to operate with the new coding standard) continue to be able to decode bit streams of the existing coding standard.

Forward Motion Vector – Information that is used for motion compensation from a reference picture at an earlier time in display order.

Forward Prediction – Prediction from the past reference vop. See Bidirectional Prediction.

Fourier Transformation – Mathematical transformation of time domain functions into frequency domain.

Four-Track or Quarter-Track Recoding – The arrangement by which four difference channels of sound may be recorded on quarter-inch-wide audio tape. These may be recorded as four separate and distinct tracks (monophonic) or two stereo pairs of tracks. Tracks 1 and 3 are recorded in the "forward" direction of a given reel, and Tracks 2 and 4 are recorded in the "reverse" direction.

FP (Fixed Part)

FPGA (Field-Programmable Gate Array) – A programmable logic chip (PLD) with a high density of gates. 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). See also PLD.

FPLL (Frequency- and Phase-Locked Loop)

FPS (Frames Per Second) – A measure of the film or video display rates. Film is 24 FPS, NTSE is 30 FPS, PAL/SECAM is 25 FPS.

Fractals – Mathematically generated descriptions (images) which look like the complex patterns found in nature (e.g., the shoreline and topographic elevations of a land mass as seen from an aerial photograph). The key property of fractal is self-similarity over different domain regions.

Fractional Compression – A global compression method that exploits highly correlated data in an image. It is resolution-independent.

Fractional T1 – Part of the bandwidth of a T1 system.

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

Fragmentation – The scattering of data over a disk caused by successive recording and deletion operations. Generally this will eventually result in slow data recall, a situation that is not acceptable for video recording or replay. The slowing is caused by the increased time needed to randomly access data. With such stores, defragmentation routines arrange the data (by copying from one part of the disk to another) so that it is accessible in the required order for replay. Clearly any change in replay, be it a transmission running order or the revision of an edit, could require further defragmentation. True random access disk stores, able to play frames in any order at video rate, never need defragmentation.

Frame – a) A frame consists of all the information required for a complete picture. For interlaced scan systems, there are two fields in a frame. For progressive video, these lines contain samples starting from one time instant and continuing through successive lines to the bottom of the frame. **b)** A complete picture composed of two fields. In the NTSC system, 525 interlaced horizontal lines of picture information in 29.97 frames per second. In the PAL system, 625 interlaced horizontal lines of picture information in 25 frames per second. **c)** The metal cabinet which contains the switcher's circuit boards. **d)** One complete video image, containing two fields. There are 30 frames in one second of NTSC video.

Frame Accurate – The importance of specific edits as compared to the ability to start, stop and search for specific frames of video. Frame accurate editing requires the use of a timecode system.

Frame Buffer – a) A block of digital memory capable of buffering a frame of video. The amount of memory required for a frame buffer is based on the video being stored. For example to store a 640 x 480 image using the RGB color space with eight bits per color, the amount of memory required would be: 640 x 480 x 3 = 921,600 bytes. **b)** A frame buffer is a digital frame store, containing a large chunk of memory dedicated to pixel memory, at least one complete frame's worth. All the pixels in the buffer have the same depth. Each bit of depth is called a bit plane. Frame buffers can use the bit planes in a variety of ways. First, a pixel's bits can store the RGB values of colors. This simple method is called full-color mode. In full-color mode, it is common to refer to the red plane, or the blue or green plane, meaning the bits reserved for specifying the RGB components of the pixel. Full-color systems may also have an alpha channel, which encodes the transparency of each bit. The alpha channel is like a matte or key of the image. Alternately, the bits can store a color number, which selects the final color from a color map. Finally, some bit planes may be reserved for use as overlay planes.

Frame Capture (Frame Grabber) – Taking one frame of video and storing it on a hard drive for use in various video effects.

Frame DCT Coding – Frame DCT coding is where the complete frame of the image is coded as a set of DCT blocks. In the case of interlace signals, the fields are combined together and then coded as a single entity.

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

Frame Frequency – The rate at which a complete frame is scanned, nominally 30 frames per second.

Frame Grabber – a) 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. **b)** A device that "captures" and potentially stores one complete video frame. Also known as Frame Storer.

Frame Offset – A way of indicating a particular frame within the group of frames identified by the edge number on a piece of film. For example, a frame offset of +12 indicates the twelfth frame from the frame marked by the edgecode.

Frame Period – The reciprocal of the frame rate.

Frame Picture – A picture in which the two fields in a frame are merged (interlaced) into one picture which is then coded.

Frame Pulse – A pulse superimposed on the control track signal. Frame pulses are used to identify video track locations containing vertical sync pulses.

Frame Rate – a) The rate at which frames of video data are scanned on the screen. In an (M) NTSC system, the frame rate is 29.97 frames per second. For (B, D, G, H, I) PAL, the frame rate is 25 frames per second. **b)** The number of frames per second at which a video clip is displayed. **c)** The rate at which frames are output from a video decoding device or stored in memory. The NTSC frame rate is 30 frames/second while some graphics frame rates are as high as 100 frames/second.

Frame Rate Conversion – The process of converting one frame rate to another. Examples include converting the (M) NTSC frame of 29.97 frames per second to the PAL frame rate of 25 frames per second.

Frame Relay – A network interface protocol defined by CCITT Recommendation I.122 as a packet mode service. In effect it combines the statistical multiplexing and port sharing of X.25 packed switching with the high speed and low delay of time division multiplexing and circuit switching. Unlike X.25, frame relay implements no layer 3 protocols and only the so-called core layer 2 functions. It is a high-speed switching technology that achieves ten times the packet throughput of existing X.25 networks by eliminating two-thirds of the X.25 protocol complexity. The basic units of information transferred are variable length frames, using only two bytes for header information. Delay for frame relay is lower than X.25, but it is variable and larger than that experienced in circuit switched networks.

Frame Roll – A momentary vertical roll.

Frame Store – a) Term used for a digital full-frame temporary storage device with memory for only one frame of video. **b)** An electronic device that digitizes a TV frame (or TV field) of a video signal and stores it in memory. Multiplexers, fast scan transmitters, quad compressors and even some of the latest color cameras have built-in frame stores.

Frame Store Synchronizer – A full-frame synchronizer used by a time base corrector with full-frame memory and can be used to synchronize two video sources.

Frame Switcher – Another name for a simple multiplexer, which can record multiple cameras on a single VCR (and play back any camera in full screen) but does not have a mosaic image display.

Frame Synchronizer – A digital buffer, that by storage, comparison of sync information to a reference, and time release of video signals, can continuously adjust the signal for any timing errors. A digital electronic device which synchronizes two or more video signals. The frame synchronizer uses one of its inputs as a reference and genlocks the other video signals to the reference's sync and color burst signals. By delaying the other signals so that each line and field starts at the same time, two or more video images can be blended, wiped and otherwise processed together. A TBC (Time Base Controller) takes this a step further by synchronizing both signals to a stable reference, eliminating time base errors from both sources. The Digital Video Mixer includes a frame synchronizer and dual TBCs.

Frame Transfer (FT) – Refers to one of the three principles of charge transfer in CCD chips. The other two are interline and frame-interline transfer.

Frame-Based 2D Animation – A two-dimensional animation technique in which an object is moved from one position, size, and color to another. Adobe After Effects, for example, uses keyframes to create frame-based 2D animation. One of the two main types of animation associated with digital video. Compare Cell Animation.

Frame-Interline Transfer (FIT) – Refers to one of the few principles of charge transfer in CCD chips. The other two are interline and frame transfer.

Framing – For multiplexed digital channels, framing is used as a control procedure. The receiver can identify time slots of the subchannels by the framing bits that were added in generating the bitstream.

Framing Tool – One of the tools of the Protection Layer used to segment the content of the LP-SDU in elements of a given length that can be variable.

Franchise – An agreement between a CATV operator and the governing cable authority. A franchise agreement is essentially a license to operate.

Franchising Authority – Governmental body (city, county, or state) responsible for awarding and overseeing cable franchises. In New Jersey, the Local Franchising Authority is the Board of Public Utilities (BPU).

Free-Run – Process of allowing a digital circuit (typically a microprocessor) to run without feedback (open-loop). This is done to stimulate other devices in the circuit in a recurring and predictable manner.

Freeze Frame – Special effect in which the picture is held as a still image. It is possible to freeze either one field or a whole frame. Freezing one field provides a more stable image if the subject is moving, however, the resolution of the video image is half that of a full frame freeze. Digital freeze frame is one special effect that could be created with a special effects generator or a TBC (Time Base Controller). The Digital Video Mixer includes this feature.

French Proposals – Three HDEP proposals, two closely related, suggested by a number of French organizations. For countries with a field rate of 50 field per second, there would be 1200 scanning lines, 1150 of them active. For countries with a field rate of 59.94 fields per second, there would be 1001 scanning lines, 970 of them active. Both systems would have identical line rates (60,000 lines per second) and bandwidths (65 MHz luminance), and would be progressively scanned. This correspondence would allow a great deal of common equipment, as Recommendation 601 does for digital component video. The third proposal is for a worldwide standard based on 1050 scanning lines (970 active), 2:1 interlace, and 100 field per second.

Frequency – The number of cycles a signal that occurs per second, measured in hertz (repetition rate. In electronics, almost invariably the number of times a signal changes from positive to negative (or vice versa) per second. Only very simple signals (sine waves) have a single constant frequency; the concept of instantaneous frequency therefore applies to any transition, the frequency said to be the frequency that a sine wave making the same transition would have. Images have spatial frequencies, the number of transitions from dark to light (or vice versa) across an image, or per degree of visual field.

Frequency Allocation Table – List of which frequencies can be used for transmission of different signals in the U.S. It may require revision for certain ATV (Advanced TV) schemes. A similar function is performed internationally by the International Frequency Registration Board (IFRB), like the CCIR, part of the International Telecommunications Union.

Frequency Domain – A concept that permits continuous functions in the space or time domain to be mapped into a representation with linear properties in frequency coordinates. It benefits the application of mathematical functions. For example, spectrum analysis can be performed on the sampled signal.

Frequency Interleaving – The process by which color and brightness signals are combined in NTSC.

Frequency Modulation – a) Modulation of sine wave or "carrier" by varying its frequency in accordance with amplitude variations of the modulating signal. **b)** Also referring to the North American audio service broadcast over 88 MHz-108 MHz.

Frequency Multiplex – See Multiplex.

Frequency Response – The range of frequencies that a piece of equipment can process and is directly related to the system's ability to uniformly transfer signal components of different frequencies over the entire video spectrum without affecting their amplitudes. This parameter is also known as gain/frequency distortion or amplitude versus frequency response. The amplitude variation maybe expressed in dB, percent or IRE. The reference amplitude (0 dB, 100%) is typically the white bar or some low frequency signal component. Frequency response numbers are only meaningful if they contain three pieces of information: the measured amplitude, the frequency at which the measurement was made and the reference frequency. There are a number of test signals that can be used including multiburst, multipulse, a swept signal or sin (x)/x.

Frequency Response Curve – The curve relating the variation in output with frequency of a piece of equipment or magnetic tape when the input is kept constant.

Frequency Response Rolloff – A distortion in a transmission system where the higher frequency components are not conveyed at their original full amplitude. In video systems, this causes loss of color saturation.

Frequency Synthesizer – An electronic circuit that generates a number of frequencies from a fixed-reference frequency. Some frequency synthesizers generate only a relatively small number of frequencies; others generate hundreds of different frequencies.

Fringing – The pickup of extra bass frequency signals by a playback head when reproducing a signal recorded by a head with a wider track configuration, such as playing a full track tape with a half-track head.

From Source – VTR or other device that is generating the video/audio signal that is being dissolved or wiped away from.

Front Porch – The portion of the video signal between the end of active picture time and the leading edge of horizontal sync. See Horizontal Timing.

Front-to-Back Ratio – The ratio between a cardioid microphone's sensitivity to sounds arriving from the front and from the rear, a measure of its directionality.

FSM (Finite States Machine) – A finite states machine is a markovian source, meaning that the evolution after the time t depends only on the machine state at the time t and the future inputs. Particularly, the evolution doesn't depend on the sequence that brought the machine in its current state.

FSS (Fixed Satellite Services) – Provides point-to-point and point-to-multi-point satellite communications of voice, data and video between fixed or stabilized earth stations. Major providers of space segment include INTELSAT, PanAmSat Corporation, EUTELSAT, Telesat Canada and GE Americom Communications, Inc.

FST (Fast Slant Transform) – Applied on image subblocks.

FT (Fixed Termination)

FTP (File Transfer Protocol) – A client-server protocol which allows users to transfer files over a TCP/IP network. FTP is also the name for the client program the user executes to transfer files. Though it was once the only way to download files on the Internet, it has now been integrated into many web browsers.

FTTC (Fiber to the Curb) – The installation of optical fiber to within a thousand feet of the home or office.

FTTH (Fiber to the Home) – The installation of optical fiber from the carrier directly into the home or office.

FUCE – Full compatible EDTV. A Hitachi ATV scheme filling a Fukinuki hole for increased luminance detail, with recent proposed additions to increase chroma detail.

Fukinuki – Takahiko Fukinuki and the Fukinuki Hole named for him. Fukinuki is a Hitachi researcher who proposed filling an apparently unused portion of the NTSC spatio-temporal spectrum with additional information that might be used for ATV. The signal that fills a Fukinuki hole is sometimes referred to as a Fukinuki subcarrier. It is extremely similar to the color subcarrier and can cause an effect like cross-luminance under certain conditions.

Full Duplex – Sending data in both directions at the same time. Usually higher quality than half duplex, but requires more bandwidth. In video conferencing, full duplex will be much more natural and useable. Cheap speakerphones are half duplex, whereas more expensive ones are full duplex.

Full Field – All sampled points in the digital component signal as opposed to active picture (AP) which are all sampled points in the digital component signal with the exception of the points between EAV and SAV.

Full Field Signals – Signals with video on each line of active video. These signals can only be used for out of service testing.

Full Field Testing – See Out of Service Testing.

Full Motion Video (FMV) – Video that plays at 30 frames per second (NTSC) or 25 frames per second (PAL).

Full Track Recording – Recording monophonically on one track whose width is essentially the same as the tape's.

Full-Color Mode – Full-color mode is distinguished by: each pixel contains its own values; a full-color render takes about three times as long as color mapped render. Anti-aliasing, transparency, and texture mapping are possible only in this mode. Full-color mode makes possible such things as transparency, texture mapping, and anti-aliasing.

Fusion Frequency – The minimum rate of presentation of successive images of a motion picture that allows motion to seem smooth, rather than jerky. The fusion frequency is almost always lower than the flicker frequency. As it applies to the rate at which images are presented, rather than the rate at which they were shot, material that appears to be at or above the fusion frequency when viewed at normal speed may be below it when viewed in slow motion. Techniques to smooth motion presented at a rate below the fusion frequency have been developed for such purposes as computer-assisted animation; these are sometimes called in-betweening techniques. See also Judder.

Future Reference Picture – A future reference picture is a reference picture that occurs at a later time than the current picture in display order.

Future Reference VOP – A future reference vop is a reference vop that occurs at a later time than the current vop in display order.

▶ G

G.711 – This ITU recommendation defines an 8-bit A-law (European companding) and μ-law (American companding) PCM audio format with 8 kHz sampling used in standard telephony. G.711 audio is also used in H.320 video conferencing. 64 kbps PCM speech coder for 3 kHz sampled bandwidth.

G.722 – This is an ITU-T recommendation which embraces 7 kHz audio coding at 64 kbit/s. G.722 uses an adaptive differential PCM (ADPCM) algorithm in two sub-bands, and is widely used for news and sports commentary links. The sound quality is normally considered inferior compared to MPEG audio coding, but has the advantage of low coding delay in comparison with MPEG. Due to the low delay, and because of the large installed base of G.722 equipment, the algorithm will continue to be in service.

G.723.1 – Dual-rate speech coder with 5.3/6.3 kbps compressed bitrates. It is a linear prediction analysis-by-synthesis coder using ACELP/MP-MLQ excitation methods.

G.726 – This ITU-T recommendation is entitled "40, 32, 24, 16 kbit/s adaptive differential pulse code modulation (ADPCM)". It defines the conversion between 64 kbit/s A-law or μ-law PCM audio and a channel of the rates stated in the title, by using ADPCM transcoding.

G.728 – This ITU-T recommendation defines coding of speech at 16 kbit/s based on code-excited linear prediction (CELP). The delay of about 2 ms in G.728 is lower than other typical implementations of this type of coding. G.728 audio is used in H.320 video conferencing.

G.729/G.729A – Conjugate structure-ACELP algorithm for 3 kHz speech bandwidth input and 8 kbps coded bitstream. Used in simultaneous voice and data (DSVD) applications.

G.7xx – A family of ITU standards for audio compression.

GA – See Grand Alliance.

Gain – a) Any increase or decrease in strength of an electrical signal. Gain is measured in terms of decibels or number of times of magnification. **b)** The ratio of output power to the input power for a system or component. **c)** The amount of amplification of a circuit. The term gain is often used incorrectly to denote volume and loudness which are psychological factors which are the results of "gain".

Gain Ratio Error – In a three wire interconnect CAV system, the gain of one signal may be higher or lower then what it should be because of gain distortion caused by one channel. This will cause the ratio of signal amplitudes to be incorrect. This error manifests itself as color distortions. In some cases, errors in gain ratio will generate illegal signals (see the discussion on Illegal Signals). The distorted signal may be legal within its current format but could become illegal if converted into a different component format.

Gain/Frequency Distortion – Distortion which results when all of the frequency components of a signal are not transmitted with the same gain or loss. A departure from "flatness" in the gain/frequency characteristic of a circuit. Refer also to the Frequency Response discussion.

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

Gamma – Since picture monitors have a nonlinear relationship between the input voltage and brightness, the signal must be correspondingly predistorted. Gamma correction is always done at the source (camera) in television systems: the R, G, and B signals are converted to R 1/g, G 1/g, and B 1/g. Values of about 2.2 are typically used for gamma. Gamma is a transfer characteristic. Display devices have gamma (or at least CRTs do). If you measure the actual transfer characteristic of a CRT used for either television display or computer display, you will find it obeys a power law relationship:

Light = Volts^gamma

where gamma is 2.35 plus or minus 0.1. CRTs have values between 2.25 and 2.45, 2.35 is a common value. It is a function of the CRT itself, and has nothing to do with the pictures displayed on it. CRT projectors are different, green tubes are typically 2.2 while red is usually around 2.1 and blue can be as low as 1.7. But there are no direct-view CRTs which have values lower than 2.1. Pictures which are destined for display on CRTs are gamma-corrected, it means that a transfer characteristic has been applied in order to try to correct for the CRT gamma. Users of TV cameras have to accept the characteristic supplied by the manufacturer, except for broadcasters who have adjustable camera curves (the video engineers adjust the controls until they like the look of the picture on the studio monitor in their area). Even so, no TV camera uses a true gamma curve, they all use rather flattened curves with a maximum slope near black of between 3 and 5. The higher this slope, the better the colorimetry but the worse the noise performance.

Gamma Correction – a) The RGB data is corrected to compensate for the gamma of the display. **b)** Historically, gamma correction was a precompensation applied to the video signal at the camera to correct for the nonlinearities of the CRT (i.e., power function of the electron gun) and, as such, it was the inverse of the electron gun function. It is now widely used, however, to describe "the total of all transfer function manipulations" (i.e., including the departures from a true power law function), whether inherent or intentionally introduced to act upon the video signal for the purpose of reducing the bandwidth for signal processing, making the image on the final display conform to preconceived artistic objectives, and/or providing noise suppression, or even bit rate reduction. **c)** The insertion of a nonlinear output-input characteristic for the purpose of changing the system transfer characteristic. As this usage has grown, the IEEE definition correlating gamma to an analytical function becomes optimistic. **d)** An adjustment factor used to correct an image's intensity when it is displayed. Display devices can perform gamma correction but raster images can also be gamma corrected with software prior to display.

Gamma Ferric Oxide – The common magnetic constituent of magnetic tapes in the form of a dispersion of fine acicular particles within the coating.

Gamma Table – A table of constants which functions as a nonlinear amplifier to correct the electron gun drive voltages so that the CRT display appears to be linear. Because the gamma function for each color is different in a typical CRT, different values for each color are usually contained in the gamma table. This processes is called Gamma Correction.

Gamma, Electronic – a) The exponent of that power law that is used to approximate the curve of output magnitude versus input magnitude over the region of interest. **b)** Video – The power function of the electro gun in a CRT. It has become customary in video, as in photography, to extend the meaning and to use gamma as a synonym for the complete transfer function regardless of curve shape. Note: In the electronics system, increasing gamma decreases image contrast. **c)** Imaging Processing and Display – Nonlinear processing is useful in many television systems as a means of bandwidth limiting, and is normally applied at the camera. Given the predominance of CRT displays, the chosen exponent is related to that of the electron gun (typically 2.2 for systems with 525/59.94 scanning, 2.8 for systems with 625/50 scanning, and 2.22 for SMPTE 240M).

Gamma, Photographic – a) The slope of the transfer function: density (log of reciprocal transmission) vs. log exposure. It is thus the power function correlating transmission to exposure. **b)** Gamma in the photographic sense was originally applied specifically to the straight-line portion of the transfer function. Only if all of the photographic densities corresponding to light intensities in the scene lie within that straight-line portion of the transfer function is gamma proportional to contrast. It is sometimes loosely used to indicate either an average or a point slope of the transfer function. Note: In the photographic system, increasing gamma increases image contrast.

Gamut – The range of voltages allowed for a video signal, or a component of a video signal. Signal voltages outside of the range (that is exceeding the gamut) may lead to clipping, crosstalk, or other distortions.

Gang – Any combination of multiple tracks that are grouped. An edit that is performed on one track is also performed on tracks that are ganged together.

Gap – The space between the pole pieces of a tape head.

GAP (Generic Access Profile) – The Generic Access Profile (GAP) is the basic DECT profile and applies to all DECT portable and fixed parts that support the 3.1 kHz telephony service irrespective of the type of network accessed. It defines a minimum mandatory set of technical requirements to ensure interoperability between any DECT GAP fixed part and portable part.

Gap Depth – The dimension of the gap measured in the direction perpendicular to the surface of a head.

Gap Length – The dimension of the gap of a head measured from one pole face to the other. In longitudinal recording, the gap length can be defined as the dimension of the gap in the direction of tape travel.

Gap Loss – The loss in output attributable to the finite gap length of the reproduce head. The loss increases as the wavelength decreases.

Gap Scatter – The phenomenon of the gaps in a multitrack head not being in a straight line.

Gap Smear – This is due to head wear and is the bridging or shorting out of the record or reproduce gap as the result of flowing of the pole face material in the direction of tape motion.

Gap Width – The dimension of the gap measured in the direction parallel to the head surface and pole faces. The gap width of the record head governs the track width. The gap widths of reproduce heads are sometimes made appreciably less than those of the record heads to minimize tracking errors.

Gatekeeper – In the H.323 world, the gatekeeper provides several important functions. First, it controls access to the network, allowing or denying calls and controlling the bandwidth of a call. Second, it helps with address resolution, making possible email type names for end users, and converting those into the appropriate network addresses. They also handle call tracking and billing, call signaling, and the management of gateways.

Gateway – a) Gateways provide a link between the H.323 world and other video conferencing systems. A common example would be a gateway to an H.320 (ISDN) video conferencing system. **b)** Gateways provide functional bridges between networks by receiving protocol transactions on a layer-by-layer basis from one protocol (SNA) and transforming them into comparable functions for the other protocol (OSI). In short, the gateway provides a connection with protocol translation between networks that use different protocols. Interestingly enough, gateways, unlike the bridge, do not require that the networks have consistent addressing schemes and packet frame sizes. Most proprietary gateways (such as IBM SNA gateways) provide protocol converter functions up through layer six of the OSI, while OSI gateways perform protocol translations up through OSI layer seven. See OSI Model.

Gauss – The metric unit of magnetic flux density equal to one Maxwell per square centimeter.

GBR Format – The same signals as RGB. The sequence is rearranged to indicate the mechanical sequence of the connectors in the SMPTE standard.

GCR – See Ghost Cancellation Reference Signal.

G-DOTS – ITU Recommendations for speech coding standards.

GE (General Electric) – A proponent of the ACTV schemes.

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

General Purpose Interface (GPI) – a) A connector on the back of the switcher frame or editor which allows remote control of the Auto Trans, DSK Mix, Fade to Black or Panel Memory Function or Sequence on the switcher. This is usually a contact closure (i.e., switch) which provides short to ground. **b)** A standard interface for control of electronic equipment.

General Purpose Serial Interface (GPSI) – A form of translator which allows the switcher to talk to other devices, i.e., ADO, and to be given instructions by devices such as Editors serially.

Generation – The number of duplication steps between an original recording and a given copy. A second generation duplicate is a copy of the original master and a third generation duplicate is a copy of a copy of the original master, etc.

Generation Loss – When an analog master videotape is duplicated, the second-generation copy is usually inferior in some way to the master. This degradation appears as loss of detail, improper colors, sync loss, etc. Limited frequency response of audio/video magnetic tape and imperfections in electronic circuitry are the main causes of generation loss. Higher performance formats (such as 1") exhibit much less generation loss than more basic formats. Digital formats make generation loss negligible because each copy is essentially an exact duplicate of the original. Video enhancing equipment can minimize generation loss. Some video processors pre-enhance the video signal to overcome generation loss.

Genlock – a) The process of locking both the sync and burst of one signal to the burst and sync of another signal making the two signals synchronous. This allows the receiver's decoder to reconstruct the picture including luminance, chrominance, and timing synchronization pulses from the transmitted signal. **b)** The ability to internally lock to a non-synchronous video. AVC switchers allow genlocked fades on the DSK. **c)** Equipment or device that recovers the original pixel clock and timing control signals (sync) from a video signal; thus allowing an NTSC/PAL decoder to correctly decode the video signal. **d)** A way of locking the video signal of a camera to an external generator of synchronization pulses.

Genlock Outputs – A timed color black output synchronous with the input reference video. The AVC series also provides the DSK genlocked color black. On 4100 series switchers this also includes composite sync, subcarrier, vertical and horizontal drive pulses, burst flag pulse and composite blanking.

Geometric Distortion – Any aberration which causes the reproduced picture to be geometrically dissimilar to the perspective plane projection of the original scene.

Geometry – The shape of objects in a picture, as oppose to the picture itself (aspect ratio). With good geometry, a picture of a square is square. With poor geometry, a square might be rectangular, trapezoidal, pillow-shaped, or otherwise distorted. Some ATV schemes propose minor adjustments in geometry for aspect ratio accommodation.

Geostationary Orbit – A satellite orbit 22,300 miles above earth's equator circling the earth at the same rate earth rotates.

Ghost – A shadowy or weak image in the received picture, offset either to the left or right of the primary image, the result of transmission conditions which create secondary signals that are received earlier or later than the main or primary signal. A ghost displaced to the left of the primary image is designated as "leading" and one displaced to the right is designated as "following" (lagging). When the tonal variations of the ghost are the same as the primary image, it is designated as "positive" and when it is the reverse, it is designated as "negative". See Multipath Distortion.

Ghost Cancellation Reference (GCR) Signal – ITU-R BT.1124 standard reference signal found on lines 19 and 282 of (M) NTSC systems and on line 318 (B, D, G, H, I) of PAL systems. This signal allows for the removal of ghosting from TVs by filtering the entire transmitted signal based on the condition of the transmitted GCR signal.

Ghost Point – A supplementary point included on the tangent to the acquired point in order to force the line to begin and end on the acquired points.

Ghosting – A weak, secondary, ghost-like duplicate video image in a video signal caused by the undesired mixing of the primary signal and a delayed version of the same signal.

GHz (Gigahertz) – Billions of cycles per second.

Gibbs Effect – The mirage-like haze at the boundaries of picture objects, seen in DCT-based compression algorithms at high compression ratios. The effect is most noticeable around text and high-contrast geometrical shapes.

GIF (Graphic Interchange Format) – A bit-mapped graphics file format popular for storing lower resolution image data.

Gigabyte (GB) – One billion bytes (1,073,741,824 bytes) of information.

Glenn – William and Karen Glenn, researchers for NYIT in Dania, Florida, who developed the VISTA ATV scheme. They are often cited for their work indicating that human vision cannot simultaneously perceive high spatial detail and high temporal detail.

Glitch – a) A form of low frequency interference, appearing as a narrow horizontal bar moving vertically through the picture. This is also observed on an oscilloscope at field or frame rate as an extraneous voltage pip moving along the signal at approximately reference black level. **b)** Slang for visual error, i.e., dropout on tape, spikes at switcher pattern boundaries. Patterns that jump off screen or any other aberration. **c)** Slang for a fault in data transmission or other error that does not cause a total lock up.

Glitch Impulse – A term used to define the voltage/time function of a single DAC step until the output video level has settled to within +/- 1 LSB of the final value. Glitches are apt to appear in output video as the input to the DAC changes from:

0111 1111 to 1000 0000

Global (Menu) – A separate channel that allows additional rotations to be superimposed on an image and, in 3D systems, "motion on motion" in an effect.

Global Data Set – A data set with all data essence or metadata elements defined in the relevant data essence standard or Dynamic Metadata Dictionary.

Gloss Level – A shiny surface imparted to the magnetic coating due to calende ring.

GMC (Global Motion Compensation) – Global motion compensation (GMC) is an important tool for a variety of video processing applications including for instance segmentation and coding. The basic idea is that a part of the visible 2D motion within video sequences is caused by camera operation (translation, rotation, zoom).

GMSK (Gaussian Minimum Shift Keying) – Gaussian Minimum Shift Keying is the modulation technique used in GSM networks. It employs a form of FSK (Frequency Shift Keying). GMSK was been chosen because it provides good spectral efficiency.

GMT (Greenwich Mean Time) – Greenwich, England has been the home of Greenwich Mean Time (GMT) since 1884. GMT is sometimes called Greenwich Meridian Time because it is measured from the Greenwich Meridian Line at the Royal Observatory in Greenwich. Remember: Clocks Spring Forward & Fall Back (Fall = Autumn), but GMT remains the same all year around.

GOP (Group of Pictures) – a) A GOP starts with an I-picture and ends with the last picture before the next I-picture. **b)** A picture sequence which can be coded as an entity. For instance, it is possible to cut between GOPs. For that reason, the first picture in a GOP has to be intra-coded (I-picture). Time codes are carried on GOP levels.

Gouraud Shading – This type of smooth shading has no true "specular" highlights and is faster and cheaper than Phong shading (which does).

GOV (Group of Video Object Planes)

GPI (General Purpose Interface) – In computerized editing systems, GPIs allow the computer to control various remote components.

GPI Trigger – The signal sent by a GPI that instructs an external device to execute a particular command, such as to start or stop playback of a video effect.

GPI/GPO (General Purpose Input/General Purpose Output)

GPS (Global Positioning System) – The GPS (Global Positioning System) is a "constellation" of 24 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. Accuracy can be pinpointed to within one meter with special military-approved equipment. GPS equipment is widely used in science and has now become sufficiently low-cost so that almost anyone can own a GPS receiver.

GPSI (General Purpose Serial Interface) – Allows direct access to/from the MAC if an external encoding/decoding scheme is desired.

Graceful Degradation – Capability of decoders to decode MPEG-4 services that are above their capacity.

Gradient – a) In graphics, having an area smoothly blend from one color to another, or from black to white, or vice versa. **b)** A blended mix of two or three colors that you can use to draw or fill objects.

Grand Alliance (GA) – The U.S.' grouping, formed in May 1993, to produce "the best of the best" initially proposed HDTV systems. The participants are: AT&T, General Instrument Corporation, Massachusetts Institute of Technology, Philips Consumer Electronics, David Sarnoff Research Center, Thomson Consumer Electronics and Zenith Electronics Corporation. The format proposed is known as the ATSC format.

Granules – In MPEG Audio Layer II, a set of 3 consecutive sub-band samples from all 32 sub-bands that are considered together before quantization. They correspond to 96 PCM samples. In MPEG Audio Layer III, 576 frequency lines carry their own side information.

Graphic Equalizer – An equalizer which indicates its frequency response graphically through the position of its controls. When the controls are in a straight line at the 0 position, the response is flat.

Graphics Board – The printed circuit board within a workstation that contains the graphics processors.

Graphics Combination Profile – A combination profile that describes the required capabilities of a terminal for processing graphical media objects.

Gray Card – A nonselective (color neutral) diffuse reflector intended to be lighted by the normal illumination of the original scene, and having a reflectance factor of 18% (compared with a perfect reflector at 100% and prepared magnesium oxide at 98%). The gray card luminance is used as a guide in determining scene exposure so that the image is placed upon the most favorable portion of the transfer function curve.

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

Gray Point – See Gamma.

Gray Scale – a) The luminance portion of the video signal. A scale of 10 from TV black to TV white indicating the shades of gray a camera can see at any one time and to which a camera can be adjusted. A gray scale adjustment of 7 is good. **b)** An optical pattern in discrete steps between light and dark. Note: A gray scale with ten steps is usually included in resolution test charts.

Gray Scale Shape – Gray Level Alpha Plane.

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

Green Screen – See Blue Screen.

Green Tape – An abrasive tape used to clean and lap heads that are unevenly worn, stained, scratched, etc. Should be used with caution and should not be used on ferrite heads. This also applies to gray tape.

Ground (GND) – A point of zero voltage potential. The point in reference to which all voltages are measured.

Ground Loop – a) Hum caused by currents circulating through the ground side of a piece of equipment due to grounding different components at points of different voltage potential. **b)** An unwanted interference in the copper electrical signal transmissions with shielded cable, which is a result of ground currents when the system has more than one ground. For example, in CCTV, when we have a different earthing resistance at the camera, and the switcher or monitor end. The induced electrical noise generated by the surrounding electrical equipment (including mains) does not discharge equally through the two earthings (since they are different) and the induced noise shows up on the monitors as interference.

Grounded Electrical Outlet – An electrical wall outlet that accepts a plug that has a grounding prong. In the USA, all properly wired three-prong outlets provide a ground connection.

Group – A group is any arbitrary collection of polygons; a subset of the database, usually the group represents a coherent object. A group could contain all the polygons constituting the model of a chair, or it could contain twenty such chairs and a table. A polygon can only be in one group at a time, but it can move to another group.

Group 1, 2, 3 and 4 – The ITU-T Group 1 to 4 specify compression of black and white documents and the operation of facsimile equipment. Group 3 (also known as G3 or T.4) is presently the most important standard in the world of fax and document storage applications. G3 compression features modified Huffman encoding. The ITU-T Group 4 (also known as G4 or T.6) is an improvement of ITU-T G3, dedicated to digital telephone lines, in particular ISDN.

Group Delay – a) A distortion present when signal components of different frequencies experience different delays as they pass through a system. Distortions are expressed in units of time. The largest difference in delay between a reference low frequency and the other frequencies tested is typically quoted as the group delay distortion. Group delay problems can cause a lack of vertical line sharpness due to luminance pulse ringing, overshoot or undershoot. The multipulse or sin (x)/x signals can be used to check for group delay in the same way as these signals are used to check for chrominance to luminance delays. **b)** A signal defect caused by different frequencies having differing propagation delays.

GSM (Global System for Mobile Communication) – Also known as Groupe Speciale Mobile. A European radio standard for mobile telephones (based on TDMA-8) in the 900 MHz band.

GSTN (General Switched Telephone Network) – The GSTN is what the public telephone network is called.

Guard Interval – Additional safety margin between two transmitting symbols in the COFDM standard. The guard interval ensure that reflections occurring in the single-frequency network are eliminated until the received symbol is processed.

Guest – A modeling object visualized in the presence of another database which will serve as a visualization support but cannot be modified.

GUI (Graphical User Interface) – A computer interface that allows the user to perform tasks by pointing to icons or graphic objects on the screen. Windows is a graphics user interface. Most multimedia programs require GUIs.

▶ H

H Drive – See Horizontal Drive.

H Phase (Horizontal Phase) – The horizontal blanking interval used to synchronize the timing of two or more video signals.

H Rate – The time for scanning one complete horizontal line, including trace and retrace. NTSC equals 1/15734 seconds (color) or 63.56 µsec.

H.222 – This ITU-T recommendation is identical to the audio specification of MPEG-2.

H.261 – a) Recognizing the need for providing ubiquitous video services using the Integrated Services Digital Network (ISDN), CCITT (International Telegraph and Telephone Consultative Committee) Study Group XV established a Specialist Group on Coding for Visual Telephony in 1984 with the objective of recommending a video coding standard for transmission at m x 384 kbit/s (m=1,2,..., 5). Later in the study period after new discoveries in video coding techniques, it became clear that a single standard, p x 64 kbit/s (p = 1,2,..., 30), can cover the entire ISDN channel capacity. After more than five years of intensive deliberation, CCITT Recommendation H.261, Video Codec for Audio Visual Services at p x 64 kbit/s, was completed and approved in December 1990. A slightly modified version of this Recommendation was also adopted for use in North America. The intended applications of this international standard are for videophone and video conferencing. Therefore, the recommended video coding algorithm has to be able to operate in real time with minimum delay. For p = 1 or 2, due to severely limited available bit rate, only desktop face-to-face visual communication (often referred to as videophone) is appropriate. For p>=6, due to the additional available bit rate, more complex pictures can be transmitted with better quality. This is, therefore, more suitable for video conferencing. The IVS (INRIA Video conferencing System) is software implementation of H.261 codec which also features PCM and ADPCM audio codecs and includes an error control scheme to handle packet losses in the Internet. **b)** The ITU-T H.261 recommendation embraces video codecs for audio visual services at p x 64 kbit/s data rate, where p is between 1 and 30. Thus, the standard is informally called "p x 64". It is aimed at low bit rate media, and is used in the H.320 video conferencing recommendation. H.261 provides a resolution of 352 x 288 pixels (CIF) or 176 x 144 pixels (QCIF), independent of bit rate. The H.261 recommendation defines both encoding and decoding. However, it defines, more strictly, how to decode than to encode the bit stream, and has room for options in the encoder. The coding is based on DCT with word-length encoding. H.261 defines both independently coded frames (key frames), and frames that frame by using block-based motion compensation (non-key frames). H.261 also defines error-correction codes, and it allows rate control by varying quantization and by dropping frames and jumping blocks.

H.262 – The H.262 recommendation is identical to the video specification of MPEG-2.

H.263 – This is an ITU-T recommendation concerning "video coding for low bit rate communication". The H.263 is dedicated to video conferencing via H.324 terminals using V.34 modems at 28.8 kbit/s, and to H.323 LAN-based video conferencing. The coding algorithm in H.263 is based on H.261, but has better performance than the H.261, and it may eventually displace H.261.

H.26L – A next-generation video codec, H.26L has been a university research project until recently. It is now being worked on by MPEG, with the intention of making it part 10 of the MPEG-4 standard.

H.310/H.321 – Broadband audiovisual communications systems and terminals over B-ISDN using ATM protocols. H.310 includes H.262 and H.261 video, H.222.1 systems and H.245 control. H.321 is a subset of H.310 which enables H.320 with broadband signaling (Q.2931).

H.320 – This is an ITU-T recommendation for low bit rate visual communication. The H.320 is entitled "narrow-band visual telephone systems and terminal equipment" and is widely accepted for ISDN video conferencing. The H.320 is not a compression algorithm, but is rather a suite of standards for video conferencing. H.320 specifies H.261 as the video compression, and defines the used of one of three audio formats: either G.711, G,722 or G.728.

H.322 – Visual telephone systems for guaranteed QoS LANs. Suite includes H.261 and H.263 video, H.225.0 and H.245 supervision and control and numerous G-DOT speech modes.

H.323 – ITU standard for video conferencing over networks that do not guarantee bandwidth, such as the Internet. H.323 is the standard that is recommended for most users in the education community.

H.324 – ITU recommendation H.324 describes terminals for low bit rate multimedia applications, utilizing V.34 modems operating over the general telephone system. H.324 terminals may carry real-time voice, data, and video or any combination, including video telephony. H.324 makes use of the logical channel procedures of recommendation H.245, in which the content of each logical channel is described when the channel is opened. H.324 terminals may be used in multipoint configurations through MCUs, and may interwork with H.320 terminals on ISDN, as with terminals on wireless networks.

H.324M – Mobile multimedia terminal adapted from H.324 but with improved error resilience.

HAD – See Half Amplitude Duration.

Half Amplitude Duration (HAD) – Commonly used as a measurement on sine-squared pulses of a test signal. It is the 50 percent point on a test waveform and the pulses are often expressed in terms of time interval T. The T, 2T and 12.5T pulses are common examples. T is the Nyquist interval or 1/2 fc where fc is the cutoff frequency of the system to be measured. For NTSC, fc is taken to be 4 MHz and T is therefore 125 nanoseconds. For PAL, fc is taken to be 5 MHz and T is therefore 100 nanoseconds.

Half D1 – An MPEG-2 video encoding mode in which half the horizontal resolution is sampled (352x480 for NTSC, 352x576 for PAL).

Half Splitting – Troubleshooting technique used for fault isolation. It involves the examination of circuit nodes approximately midway through a circuit. Once the operational state of these nodes has been determined,

the source of the fault can be isolated to the circuits either before or after this point. This process can then be continued.

Half T1 – North American transmission rate of 768 kbps.

Half-Duplex – An operational mode in which transmission of data occurs in only one direction at a time in a communications link.

Half-Duplex Transmission – Data transmitted in either direction, one direction at a time. Cheaper speakerphones are a good example of this, where only one person can talk at a time.

Halo – a) Most commonly, a dark area surrounding an unusually bright object, caused by overloading of the camera tube. Reflection of studio lights from a piece of jewelry, for example, might cause this effect. With certain camera tube operating adjustments, a white area may surround dark objects. **b)** Type of pattern border with soft edges and a mix from a vid to border matte gen then to "B" vid.

Halt – Command to stop the computer.

Handles – Material outside the IN and OUT points of a clip in a sequence. The Avid system creates handles when you decompose or consolidate material. The decompose and consolidate features can create new master clips that are shorter versions of the original master clip. The handles are used for dissolves and trims with the new, shorter master clips.

Handshake – a) The protocol that controls the flow of information between two devices. **b)** Control signals at an interface in which the sending device generates a signal indicating the new information is available, and the receiving device then responds with another signals indicating that the data has been received.

Handshaking – Process of exchanging communication parameters between two terminals.

Hanging Dots – A form of cross-luminance created by simple comb filters. It appears as a row of dots hanging below the edge of a highly saturated color. See also Cross-Luminance.

Hangover – Audio data transmitted after the silence detector indicates that no audio data is present. Hangover ensures that the ends of words, important for comprehension, are transmitted even though they are often of low energy.

Hann Window – A time function applied sample-by-sample to a block of audio samples before Fourier transformation.

Hard Banding – A variation in thickness or elasticity across the width of the tape, it may be a coating defect, or it may be caused by stretch damage either during manufacture or in use. It results in a variation of the recovered RF due to the effect on head-to-tape contact and may result in color saturation banding and velocity errors.

Hard Border – A hard border usually applies to patterns and is characterized by an abrupt change from background video to the border video and by an abrupt change from the border video to the foreground video. Also sometimes used to describe key borders with a high gain.

Hard Commit – Removing the soft edit properties of an edit sequence. Hard commits are different from soft commits in that hard commits cannot be restored, the commit is permanent. Hard commits force a render on the selected elements.

Hard Disk – A magnetic data recording disk that is permanently mounted within a disk drive.

Hard Key – A key effect in which areas of the keyed image are either completely transparent or completely opaque, creating a hard edge between the keyed image and background image.

Hard Recording – The immediate recording of all audio, video, timecode and control tracks on a magnetic recorder. Because hard recording creates breaks in any existing timecode or control track on the tape, the procedure is often performed on black tape when an edit is not required or in emergency circumstances. See also Crash Recording.

Hardware – a) Term used generically for equipment, i.e., VTRs, switchers, etc. **b)** Individual components of a circuit, both passive and active, have long been characterized as hardware in the jargon of the engineer. Today, any piece of data processing equipment is informally called hardware.

Hardware Inventory – An IRIX command (HINV) used to list the hardware, memory and peripheral equipment in, or connected to, a workstation.

Hard-Wired Logic – See Random Logic.

Harmonic Distortion – If a sine wave of a single frequency is put into a system, and harmonic content at multiples of that frequency appears at the output, there is harmonic distortion present in the system. Harmonic distortion is caused by nonlinearities in the system.

Harmonics – a) Whole number multiples of a frequency. Fx1 is called the fundamental or first harmonic; Fx2 is the second harmonic; Fx3 is the third harmonic; etc. **b)** Integral multiples of a fundamental frequency are harmonics of that frequency. A pure sine wave is free of harmonics. Adding harmonics to a fundamental frequency will change its wave shape. A square wave contains a fundamental frequency plus all the odd harmonics of that frequency.

HARP (High-Gain Avalanche Rushing Amorphous Photoconductor) – A very new type of image sensor (target) for a camera tube. HARP target tubes are about 10 times more sensitive to light than conventional tube types and have been demonstrated to offer hope of overcoming the sensitivity drawbacks of HDTV cameras.

HBF (Half Band Filter) – Half band filter are used in subband coding of digital video and audio signals.

HBI – See Horizontal Blanking Interval.

HBO (Home Box Office) – Time Inc.'s pay-cable and entertainment production company, a co-proposer with ATC of C-HDTV and supporter of ACTV.

HCR (Huffman Codeword Reordering) – Extends the Huffman coding of spectral data in an MPEG-4 AAC bitstream. By placing some of the Huffman codewords at known positions, error propagation into these so-called "priority codewords" (PCW) can be avoided.

HD (High Definition) – A frequently used abbreviation for HDEP and sometimes HDTV. The term High Definition, applied to television, is almost as old as television itself. In its earliest stage, NTSC was considered high definition (previous television systems offered from 20 to 405 scanning lines per frame).

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-0 – A set of formats based on the ATSC Table 3, suggested by the DTV Team as the initial stage of the digital television rollout.

ATSC TABLE 3
Formats for DTV Transmission
(i = interlaced, p = progressive)

Vertical Size Value (active)	Horizontal Size Value (active)	Aspect Ratio Information	Frame Rate and Scan
(HD) 1,080	1,920	16:9 (square pixel)	24p, 30p, 30i
(HD) 720	1,280	16:9 (square pixel)	24p, 30p, 60p
(SD) 480	704	4:3 non-square pixel)	24p, 30p, 30i, 60p
(SD) 480	704	16:9 (non-square pixel)	24p, 30p, 30i, 60p
(SD) 480	640	4:3 (square pixel)	24p, 30p, 30i, 60p

HD-1 – A set of formats based on the ATSC Table 3, suggested by the DTV Team as the second stage of the digital television rollout, expected to be formalized in the year 2000.

HD-2 – A set of formats based on the ATSC Table 3, suggested by the DTV Team as the third stage of the digital television rollout contingent on some extreme advances in video compression over the next five years. The added format is not part of the ATSC Table 3.

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.

HDDR – See High Density Digital Recording.

HDDTV (High Definition Digital Television) – The upcoming standard of broadcast television with extremely high resolution and aspect ratio of 16:9. It is an advancement from the analog high definition, already used experimentally in Japan and Europe. The picture resolution is nearly 2000_1000 pixels, and uses the MPEG-2 standard.

HDEP (High Definition Electronic Production) – A term bearing little or no implications for transmission and display systems. The SMPTE and the ATSC have approved one standard for HDEP, sometimes referred to as SMPTE 240M. This standard has 1125 scanning lines per frame, 60 field per second, 2:1 interlace, an aspect ratio of 16:9, extended colorimetry, and a 30 MHz base bandwidth for each of its three color components. It is based on work at NHK, but includes considerable American modifications. Clearly, the combined 90 MHz base bandwidth of this DHEP standard cannot be practically broadcast (not counting sound or modulation characteristics, it takes up as much bandwidth as 15 current broadcast channels). That is why there are so many ATV transmission schemes.

HDLC (High Level Data Link Control) – An ISO communications protocol used in X.25 packet switching networks. It provides error correction at the Data Link Layer. SDLC, LAP and LAPB are subsets of HDLC.

HD-MAC (High Definition MAC) – A variety of systems, all European except for HDMAC-60.

HDMAC-60 – The baseband and satellite transmission form of HDS-NA. See also MAC.

HDMI (High Definition Multimedia Interface) – This is a proposed digital audio/video interface for consumer equipment. It is designed to replace DVI in a backwards compatible fashion and supports EIA-861 and HDCP. Digital RGB or YCbCr data at rates up to 5 Gbps are supported (HDTV requires 2.2 Gbps). Up to 8 channels of 32-192 kHz digital audio are also supported, along with AV.link (remote control) capability and a smaller connector.

HD-NTSC – The Del Rey Group's ATV scheme, comprised primarily of a quincunx scanning scheme referred to as Tri-Scan, which would sub-sample each NTSC pixel three times, in a triangular fashion, for increased vertical and horizontal static resolution, at an effective 10 frame-per-second rate. Blanking adjustment is used for aspect ratio accommodation.

HDNTSC – The terrestrial transmission form of HDS-NA, comprised of a receiver-compatible, channel-compatible signal and an augmentation channel, which may be half-sized and low-power. The augmentation channel carries increased resolution, improved sound, widescreen panels, and pan and scan information to let an ATV set know where to apply the panels.

H-DOTS – Suites of ITU recommendations for multimedia terminals and systems that define mandatory and/or optional recommendations for video, speech (or audio), multiplex and control.

HD-PRO – A universal, worldwide HDEP proposal from the Del Rey Group, said to accommodate all ATV systems. Details are not available pending patent protection.

HDS-NA (High Definition System for North America) – The Philips Laboratories (Briarcliff, NY) ATV scheme, comprised of two separate systems, HDMAC-60, a single, satellite-deliverable channel designed to get the signal to broadcast stations and CATV head-ends, and HDNTSC, a two-channel (receiver-compatible plus augmentation) system to deliver it to home TVs.

HDTV – See High Definition Television.

HDTV 1125/60 Group – An organization of manufacturers supporting the SMPTE HDEP standard.

HDVS (High Definition Video System) – A Sony trade name for its HDEP equipment and ancillary products, such as HD videodisc players.

Head – In a magnetic recorder, the generally ring-shaped electromagnet across which the tape is drawn. Depending on its function, it either erases a previous recoding, converts an electrical signal to a corresponding magnetic pattern and records it on the tape, or picks up a magnetic pattern already on the tape and converts it to an electrical playback signal. 2 Head: The system used on most cassette recorders, requiring that playback occur after the recording has been made. 3 Head: Refers to the recording/playback head configuration within the recorder. A 3-head system allows simultaneous playback of recorded material.

Head Alignment – Mechanical adjustment of the spatial relationships between the head gaps and the tape.

Head Block – An assembly holding an erase, record and playback head in a certain physical alignment.

Head Clogging – The accumulation of debris on one or more heads usually causing poor picture clarity during playback. Clogging of the playback head with debris causes dropouts.

Head Demagnetizer or Degausser – A device used to neutralize possible residual or induced magnetism in heads or tape guides.

Head Frame – The first frame in a clip of film or a segment of video.

Headend – Facility in cable system from which all signals originate. Local and distant television stations, and satellite programming, are picked up and amplified for retransmission through the system.

Head-End – The part of a CATV system from which signals emanate.

Header – A block of data in the coded bit stream containing the coded representation of a number of data elements pertaining to the coded data that follow the header in the bit stream.

Header/Descriptor – See Image File Header/Descriptor.

Headroom – a) The number of dB increases possible above the operation level (0 VU) before unacceptable distortion occurs. **b)** In composition, the space between a subject's head and the upper boundary of the frame. **c)** The difference between the nominal level (average) and the maximum operating level (just prior to "unacceptable" distortion) in any system or device. Because it is a pure ratio, there is no unit or reference-level qualifier associated with headroom – simply "dB"; headroom expressed in dB accurately refers to both voltage and power.

Heads Out – A way of winding tape so that the beginning of a selection is on the outside of the reel.

Head-to-Tape Contact – The degree to which the surface of the magnetic coating approaches the surface of the record or replay heads during normal operation of a recorder. Good head-to-tape contact minimizes separation loss and is essential in obtaining high resolution.

Height – The vertical positioning of a head with respect to a piece of tape. The size of the picture in a vertical direction.

Helical Recording – A video recording method in which the information is recorded in diagonal tracks. Also known as Slant-Track Recording.

Helical Scan – A method of recording video information diagonally on a tape, used in home and professional VCRs. High speed rotating video heads scan these diagonal video tracks, giving an effective tape speed much higher than the actual tape speed allowing more information to be recorded on a given length of magnetic tape.

Hermite – An option for the interpolation of an animation curve that produces a smooth curve by assigning a slope to each control point on the curve. Each control point has a tangent handle that you can use to adjust the slope for the point.

Herringbone – Patterning caused by driving a color-modulated composite video signal (PAL or NTSC) into a monochrome monitor.

Hertz (Hz) – a) The unit of frequency. Equivalent to cycles per second. **b)** An unit that measures the number of certain oscillations per second.

HEX (Hexadecimal) – Base 16 number system. Since there are 16 hexadecimal digits (0 through 15) and only ten numerical digits (0 through 9), six additional digits are needed to represent 10 through 15. The first six letters of the alphabet are used for this purpose. Hence, the hexadecimal digits read: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. The decimal number 16 becomes the hexadecimal number 10. The decimal number 26 becomes the hexadecimal number 1A.

HFC – See Hybrid Fiber Coaxial.

HHR (Half Horizontal Resolution) – Part of the MPEG-2/DVB standard where half of the normal 720 pixel horizontal resolution is transmitted while maintaining normal vertical resolution of 480 pixels. Since it is a 4:2:0 format, the color information is encoded at 240 pixels vertically and 176 pixels horizontally. Virtually all the DBS providers use HHR format since it dramatically reduces the bandwidth needed for channels, though at the expense of picture quality. Special logic in the video decoder chip in the set top box re-expands the picture to normal horizontal size by interpolation before display. 4:2:2 video at Standard Definition looks as good as the NBC analog feeds on GE-1 Ku. High bandwidth 4:2:0 video such as the NBC digital feeds on GE-1 Ku come very close to studio quality and the low bandwidth video encoded in HHR format looks like DBS.

Hi Con – A black and white hi contrast signal used as a key source. See also Matte Reel.

Hi Impedance Mike – A mike designed to be fed into an amplifier with input impedance greater than 20 to 50 ohms.

Hi-8 – 8 mm videotape format which provides better quality than VHS. An improved version of the 8 mm tape format capable of recording better picture resolution (definition). A higher-density tape is required which provides a wider luminance bandwidth, resulting in sharper picture quality (over 400 horizontal lines vs. 240 for standard 8 mm) and improved signal-to-noise ratio. Camcorders using this format are very small, light and provide a picture quality similar to S-VHS.

Hidden Line Removal – A wireframed object can be confusing to look at because edges that would be hidden are still displayed. Hidden line removal is the process of computing where edges are hidden and not drawing them.

Hierarchy – A structure of levels that organizes component elements. For example, the IRIX operating system uses a tree-like hierarchy to organize directories on a hard disk drive.

Hi-Fi (High Fidelity) – Most commonly used to refer to the high quality audio tracks recorded by many VCRs. These tracks provide audio quality approaching that of a CD. However, because they are combined with the video signal before recording, audio dubs using them are impossible without re-recording the video.

High Definition Films – British organization that began using the term High Definition for its electronic cinematography system before even color TV was broadcast in the U.S.

High Definition Television (HDTV) – a) General term for proposed standards pertaining to consumer high-resolution TV. **b)** An ATV term sometimes confused with HDEP. HDTV is usually used to describe advanced production and delivery mechanisms that will get ATV to the home. As HDEP cannot practically be broadcast, all broadcast HDTV schemes must make compromises in quality. The line between broadcast HDTV and EDTV, therefore, is difficult to define. See Minimum Performance. **c)** A TV format

capable of displaying on a wider screen (16 x 9) as opposed to the conventional 4 x 3) and at higher resolution. Rather than a single HDTV standard the FCC has approved several different standards, allowing broadcasters to choose which to use. This means new TV sets will have to support all of them. All of the systems will be broadcast as component digital. **d)** By HDTV, we normally understand transmission, rendering and display systems that feature about double the number of scanning lines, improved color quality, and less artifacts than that of today's composite systems. The video may be analog, like the Japanese MUSE or the European HD-MAC, or digital, like the ATSC system in the USA. The European, MPEG-2 based Digital Video Broadcasting (DVB) specifications embrace HDTV in addition to 625 line TV. In the USA, the Grand Alliance has succeeded in combining various digital HDTV systems into the ATSC system – a multiple format system based on MPEG-2 video coding – that allows HDTV transmissions to use the same frequency bands now used by regular NTSC television. The Japanese, who have had regular analog HDTV transmission for some time, are also planning to implement digital HDTV.

The New HDTV/SDTV Standards
(i = interlaced, p = progressive scan, * = SDTV)

Resolution	Frame Rate	Aspect Ratio
1920 x 1080	30i, 30p, 24p	16:9
1280 x 720	60p, 30p, 24p	16:9
720 x 483*	60p, 30p, 24p	16:9
640 x 480*	30i	4:3

High Density Digital Recording (HDDR) – Recording of digital data on a magnetic medium, having a flux transition density in excess of 15,000 transitions per inch per track.

High Energy Oxide – Any magnetic oxide particle exhibiting a BSHC product higher than that of gamma ferric oxide. Chromium dioxide and cobalt are the two most common examples at the present time.

High Energy Tape – A tape made with a high energy oxide.

High Frequency Subcarrier – An information channel added to a television signal where the finest brightness detail is normally transmitted. As the human visual system is least sensitive to the finest detail, it is unlikely to be bothered by interface from such a subcarrier. This technique was first applied to the NTSC color subcarrier; most recently it has been proposed in Toshiba's ATV system.

High Level – A range of allowed picture parameters defined by the MPEG-2 video coding specification which corresponds to high-definition television.

High Line Rate – More than 525 scanning lines per frame.

High Resolution (Hi-Res) – An adjective describing improvement in image quality as a result of increasing the number of pixels per square inch.

High Resolution Sciences (HRS) – Proponent of the CCF ATV scheme. HRS plans to offer other ATV schemes, including one using synchronized electron beam spatial modulation (turning each scanning line into a series of hills and valleys) in both camera and receiver to achieve increased vertical resolution.

High Sierra Format – A standard format for placing files and directories on CD-ROM, revised and adopted by the International Standards Organization as ISO9660.

High-Frequency Distortion – Undesirable variations that occur above the 15.75 kHz line rate.

High-Frequency Interference – Interference effects which occur at high frequency. Generally considered as any frequency above the 15.75 kc line frequency.

High-Level Language – Problem-oriented programming language, as distinguished from a machine-oriented programming language. A high-level language is closed to the needs of the problem to be handled than to the language of the machine on which it is to be implemented.

Highlight – a) In lighting, to add a light which will cause an area to have more light. **b)** In switchers, to allow one portion of the video to have a greater luminance level. c) In screens, monitors, displays, etc., to cause a word on the display to be brighter, commonly by inverting and surrounding the work with a box of white video.

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

Highlighting – In the menu system for DVDs it is necessary to be able to indicate a menu selection since there is no "computer mouse" available. This highlighting is accomplished through a wide variety of graphic arts and post-production techniques coupled with the capabilities provided by the DVD itself.

Highlights – a) Shiny areas that suggest intense reflections of light sources. Highlights move when light sources move relative to a surface, but are independent of all other lighting types. **b)** Highlights may be applied to a smooth surface by both Gouraud and Phong shading, but only the latter computes specular reflections based on the angle between reflected light from a light source and the eye's line of sight.

High-Lights – The maximum brightness of the picture, which occurs in regions of highest illumination.

High-Order – Most significant bits of a word. Typically, bit 8 through 15 of a 16-bit word.

Highpass Filter (HPF) – a) Filter that passes only high frequencies. **b)** A circuit that passes frequencies above a specific frequency (the cutoff frequency). Frequencies below the cutoff frequency are reduced in amplitude to eliminate them.

High-Speed Shutter – A feature on video cameras and camcorders that allows detail enhancement of fast-moving objects by electronically dividing the CCD into imaging sections.

HIIP (Host Image Independence Protocol) – A registered trademark of Avid Technology, Inc. HIIP allows the Avid system to import and export files in various standard formats. Also called Image Independence.

HIIP Folder – The folder containing files that support the host image independence protocol.

HILN (Harmonic Individual Line and Noise) – A parametric coding scheme for coding of general audio signals for low bit-rates provided by the MPEG-4 standard.

HIPPI (High Performance Parallel Interface) – A parallel data channel used in mainframe computers that supports data transfer rates of 100 Mbps.

Hiss – The most common audible noise component in audio recording, stemming from a combination of circuit and tape noise. Several noise reduction systems are available, such as Dolby™, DBX, DNR (Dynamic Noise Reduction), DNL (Dynamic Noise Limiter), to help alleviate such problems.

Histogram – A bar graph used in the keyer to adjust to values of the red, green, blue and luminance channels of an image when you create a matte.

Hit – See Flash.

Hitachi – Proponent of the FUCE ATV scheme and enhanced versions of FUCE.

Hi-Vision – Japanese term for HDTV.

HLO-PAL (Half-Line Offset PAL) – An early NHK proposal for an ATV transmission scheme.

HLS (Hue, Luminance and Saturation) – A color model based on human perception of colors.

Hold Time – The time data must be stable following the completion of a write signal.

Holdback Tension – Tension applied by the supply turntable to hold the tape firmly against the heads.

Hole – a) In modeling a 3D world, it is often necessary to create polygons and solids which literally have holes in them. PictureMaker can make 2D holes in individual surfaces and drill 3D holes through convex portions of closed solids. **b)** A volume in the three-dimensional NTSC spectrum into which an auxiliary sub-channel can be placed with minimal impairment. Holes are found where horizontal, vertical, and temporal detail are simultaneously high. The most famous hole is the Fukinuki hole, but the most common hole is the one carrying the NTSC color subcarrier.

Home Directory – The directory into which IRIX places you each time you log in. It is specified in your login account; you own this directory and, typically, all its contents.

Horizontal (Hum) Bars – Relatively broad horizontal bars, alternately black and white, which extend over the entire picture. They may be stationary, or may move up or down. Sometimes referred to as a "Venetian blind" effect. Caused by approximate 60 cycle interfering frequency, or one of its harmonic frequencies.

Horizontal Blanking – a) Includes the entire time between the end of the active picture time of one line and the beginning of the active picture time of the next line. It extends from the start of front porch to the end of back porch. **b)** The video synchronizing signal before and after each active television line that defines the border or black area at the left and right side of the display. In a CRT it hides (blanks out) the electron beam's retrace path as it returns from the right to the left of the display to begin scanning a new line.

Horizontal Blanking Interval (HBI) – That portion of the scanning line not carrying a picture. In NTSC, the HBI carries a synchronizing pulse and a color reference signal. Some scrambling and other systems add sound and/or data signals to the HBI. Some ATV schemes fill it with widescreen panel or detail enhancement signals. See also Blanking and Blanking Stuffing.

Horizontal Displacements – Describes a picture condition in which the scanning lines start at relatively different points during the horizontal scan. See Serrations and Jitter.

Horizontal Drive – A pulse at the horizontal sweep rate used in TV cameras. Its leading edge is coincident with the leading edge of the horizontal sync pulse and the trailing edge is coincident with the leading edge of the burst flag pulse.

Horizontal Interval – The time period between lines of active video. Also called Horizontal Blanking Interval.

Horizontal Lock – A subsystem in a video receiver/decoder which detects horizontal synchronizing pulses, compares them with the on-board video clock in the video system and uses the resultant data to stabilize the incoming video by re-synching to the system clock. In the case of severe horizontal instability, a large FIFO memory may be required to buffer the rapid line changes before they are compared and re-synchronized.

Horizontal Resolution – a) Rating of the fine detail (definition) of a TV picture, measured in scan lines. The more lines, the higher the resolution and the better the picture. A standard VHS format VCR produces 240 lines of horizontal resolution, while over 400 lines are possible with S-VHS, S-VHS-C, and Hi-8 camcorders. **b)** Detail across the screen, usually specified as the maximum number of alternating white and black vertical lines (line of resolution) that can be individually perceived across the width of a picture, divided by the aspect ratio. This number is usually expressed as TV lines per picture height. The reason for dividing by the aspect ratio and expressing the result per picture height is to be able to easily compare horizontal and vertical resolution. Horizontal chroma resolution is measured between complementary colors (rather than black and white) but can vary in some systems (such as NTSC), depending on the colors chosen. Horizontal resolution in luminance and/or chrominance can vary in some systems between stationary (static resolution) and moving (dynamic resolution) pictures). It is usually directly related to bandwidth.

Horizontal Retrace – The return of the electron beam from the right to the left side of the raster after the scanning of one line.

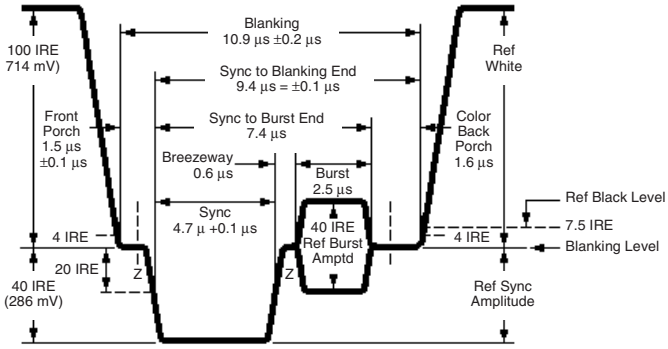
Horizontal Scan Frequency – The frequency at which horizontal sync pulses start the horizontal retrace for each line. A high frequency is needed for a non-interlaced scan. The horizontal sync frequency for NTSC is 15.75 kHz.

Horizontal Scan Rate – The rate at which the screen's scanning beam is swept from side to side. For (M) NTSC systems, this rate is 63.556 µs, or 15.734 kHz.

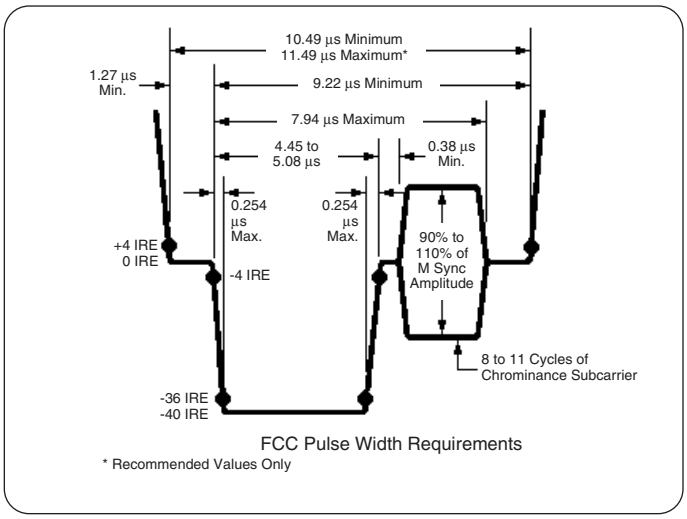
Horizontal Sync – The -40 IRE (NTSC) or the –300 mV (PAL) pulse occurring at the beginning of each line. This pulse signals the picture monitor to go back to the left side of the screen and trace another horizontal line of picture information. The portion of the video signal that occurs between the end of one line of signal and the beginning of the next. A negative going pulse from the blanking signal used to genlock (synchronize) equipment. It begins at the end of front porch and ends at the beginning of back porch.

Horizontal Sync Pulse – See Horizontal Sync.

Horizontal Timing



RS-170A Pulse Width Requirements



FCC Pulse Width Requirements

* Recommended Values Only

Host – a) Any system connected to the network. **b)** A device where module(s) can be connected, for example: an IRD, a VCR, a PC.

Host Bus – Computer system bus to which a card is connected by insertion in the appropriate slot. This will be either a PCI, an EISA or an ISA bus.

Hostname – The name that uniquely identifies each host (system) on the network.

Hot Signal – When a video signal exceeds the limitations of a display, color bleeding and over-saturation can occur. This is referred to as a hot signal. Computer graphics are able to display a wider range of color than video. It is important to keep this in mind when performing image processing functions destined for video. It is often necessary to perform a dynamic range function, or similar, to limit the color range.

House Sync – a) The black burst signal used to synchronize all the devices in the studio or station. b) Sync generated within the studio and used as a reference for generating and/or timing other signals (i.e., sync gens).

HPF – See Highpass Filter.

HQTV (High Quality TV) – Another term for HDTV.

HRS – See High Resolution Sciences.

HSB – See Hue, Saturation and Brightness.

HSI – See Hue, Saturation and Intensity.

HSL – See Hue, Saturation and Lightness.

HSM (Hierarchical Storage Management) – HSM systems transparently migrate files from disk to optical disk and/or magnetic tape that is usually robotically accessible. When files are accessed by a user, HSM systems transparently move the files back to disk.

HSV – See Hue, Saturation and Value.

HSV Space – The three numbers are hue, saturation and value. The solid is a cone. Also called HSI.

HSYNC – See Horizontal Synchronization or Sync.

HTTP (HyperText Transfer Protocol) – The protocol used by Web browsers and Web servers to transfer files, such as text and graphics.

Hue – a) A color wheel of basic pigments. All the hues of the rainbow encircle the cone's perimeter. **b)** The wavelength of the color which allows color to be distinguished such as red, blue and green. Often used synonymously with the term tint. It is the dominant wavelength which distinguishes a color such as red, yellow, etc. Most commonly, video hue is influenced by: a camera's white balance or scene lighting. Video color processors, such as the Video Equalizer, are the main tools used to adjust and correct hue problems. **c)** One of the three characteristics of television color. Hue is the actual color that appears on the screen. See Chroma and Luminance. **d)** Attribute of a visual sensation according to which an area appears to be similar to one of the perceived colors, red, yellow, green, and blue, or to a combination of two of them.

Hue, Saturation and Brightness (HSB) – With the HSB model, all colors can be defined by expressing their levels of hue (the pigment), saturation (the amount of pigment) and brightness (the amount of white included), in percentages.

Hue, Saturation and Intensity (HSI) – Color space system based on the values of Hue, Saturation and Intensity. 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.

Hue, Saturation and Lightness (HSL) – Nearly identical to HSI except Intensity is called Lightness. Both serve the same function.

Hue, Saturation and Value (HSV) – Nearly identical to HSI and HSL except Intensity and Lightness are called Value. All three serve the same function.

Huffman Coding – Method of data compression that is independent of the data type. The data could represent an image, audio or spreadsheet. This compression scheme is used in JPEG and MPEG-2. Huffman Coding works by looking at the data stream that makes up the file to be compressed. Those data bytes that occur most often are assigned a small code to represent them. Data bytes that occur the next most often have a slightly larger code to represent them. By assigning short codes to frequently occurring characters and longer codes to infrequently occurring characters, Huffman

minimizes the average number of bytes required to represent the characters in a text. Static Huffman encoding uses a fixed set of codes, based on a representative sample of data with a single pass through the data. Dynamic Huffman encoding, on the other hand, reads each text twice; once to determine the frequency distribution of the characters in the text and once to encode the data. The codes used for compression are computed on the basis of the statistics gathered during the first pass with compressed texts being prefixed by a copy of the Huffman encoding table for use with the decoding process. By using a single-pass technique, where each character is encoded on the basis of the preceding characters in a text, Gallager's adaptive Huffman encoding avoids many of the problems associated with either the static or dynamic method.

Hum – Undesirable coupling of 50 Hz (PAL) or 60 Hz (NTSC) power sine wave into other electrical signals.

Hum Bug – Another name for a ground loop corrector.

Human Factors Guidelines – A set of standards and suggestions for making the working environment more comfortable and healthy.

HUT (Households Using Television) – An estimate of the number of households within a specified coverage area which are viewing any television programming during a specified time.

HVS (Human Visual System) – Eyes and brain.

HVT (Horizontal, Vertical and Temporal) – The three axes of the spatio-temporal spectrum.

HVXC (Harmonic Vector Excitation Coding) – Harmonic Vector Excitation Coding (HVXC) enables the representation of speech signals at very low bit rates. The standard defines two HVXC bit rates: 2 kbps and 4 kbps. Unlike the code excited linear prediction (CELP) speech coder, HVXC is a parametric coding system, which means that certain aspects of the coded representation can be manipulated independently. For example, the playback speed of a HVXC-encoded bitstream can be altered without affecting the pitch of the voice. Similarly, the pitch of the voice can be modified without altering playback speed. HVXC is useful for a variety of synthetic speech applications in bandwidth-constrained environments.

Hybrid CD-ROM – A single disc containing files for both a Windows PC and a Macintosh. See CD-ROM.

Hybrid Coder – In the archetypal hybrid coder, an estimate of the next frame to be processed is formed from the current frame and the difference is then encoded by some purely intraframe mechanism. In recent years, the most attention has been paid to the motion compensated DCT coder where the estimate is formed by a two-dimensional warp of the previous frame and the difference is encoded using a block transform (the Discrete Cosine Transform). This system is the basis for international standards for video telephony, is used for some HDTV demonstrations, and is the prototype from which MPEG was designed. Its utility has been demonstrated for video sequence, and the DCT concentrates the remaining energy into a small number of transform coefficients that can be quantized and compactly represented. The key feature of this coder is the presence of a complete decoder within it. The difference between the current frame as represented as the receiver and the incoming frame is processed. In the basic design, therefore, the receiver must track the transmitter precisely, the decoder at the receiver and the decoder at the transmitter must match. The system is sensitive to channel errors and does not permit random access. However, it is on the order of three to four times as efficient as one that uses no prediction. In practice, this coder is modified to suit the specific application. The standard telephony model uses a forced update of the decoded frame so that channel errors do not propagate. When a participant enters the conversation late or alternates between image sources, residual errors die out and a clear image is obtained after a few frames. Similar techniques are used in versions of this coder being developed for direct satellite television broadcasting.

Hybrid Coding – The basic coding process used by current international standards for video telephony and MPEG. This predictive coding reduces decoder processing and storage and also gives reasonable compression and adaptability. A key feature is that a decoder is embedded in the encoder architecture.

Hybrid Editing – Combining nonlinear edited video files with linear (deck-to-deck) segments of footage.

Hybrid Fiber Coaxial – a) Hybrid fiber coaxial network is a combination of fiber optic cable and coaxial cable with bandwidth for video distribution and communications. **b)** Cable TV technology that provides two-way, high-speed data access to the home using a combination of fiber optics and traditional coaxial cable.

Hybrid Filterbank – A serial combination of Sub-band filterbank and MDCT in MPEG audio.

Hybrid Scalability – The combination of two or more types of scalability.

Hybrid Wavelet Transform – A combination of wavelet and transform algorithms within the same compression technology.

Hydrolysis – The chemical process in which scission of a chemical bond occurs via reaction with water. The polyester chemical bonds in tape binder polymers are subject to hydrolysis, producing alcohol and acid end groups. Hydrolysis is a reversible reaction, meaning that the alcohol and acid groups can react with each other to produce a polyester bond and water as a by-product. In practice, however, a severely degraded tape binder layer will never fully reconstruct back to its original integrity when placed in a very low-humidity environment.

Hypercardioid – A directional pickup pattern where maximum discrimination occurs at more than 90 and less than 180 degrees off axis.

Hyper-HAD – An improved version of the CCD HAD technology, utilizing on-chip micro-lens technology to provide increased sensitivity without increasing the pixel size.

▶ I

I – Improved or Increased; also the in-phase component of the NTSC color subcarrier, authorized to have more than twice as much horizontal resolution as the Q, or quadrature component. Few TV sets have ever taken advantage of this increased chroma resolution, though there is renewed interest.

I, W, Q, B – An NTSC test signal used to check television broadcast equipment. It consists of an I signal followed by a white bar, then a Q signal and a black level on each line.

I/O – See Input/Output.

I/O Device – Input/output equipment used to send information or data signals to and from an editing computer.

I/O Mapped I/O – I/O devices that are accessed by using instructions and control signals that differ from those of the memory devices in a system. Assigns I/O devices to a separate address space.

I/Q – In Phase/Quadrature Phase.

I2C (Inter-Integrated Circuit) – Bidirectional, two-line interface to interface integrated circuits capable of transmitting 100 kbits/sec in normal mode or 400 kbits/sec in fast mode. In conjunction with a processor it can be used to control TV reception, TV decoders/encoders, AD or DA conversion. In audio it can be used to control tone, volume, AD or DA conversion, amplification, etc.

I720 – Name of the programmable video processor family from Intel.

IB (In-Band)

IBA – Britain's Independent Broadcasting Authority, home of a great deal of ATV research.

IBE (Institution of Broadcast Engineers)

IBM – Member of the AEA ATV Task Force; also one of the first organizations to suggest sub-sampling as a technique for compatibility increasing detail.

IBO (Input Back-Off) – The ratio of the signal power measured at the input to a high power amplifier to the input signal power that produces the maximum signal power at the amplifier's output. The input back-off is expressed in decibels as either a positive or negative quantity. It can be applied to a single carrier at the input to the HPA (carrier IBO), or to the ensemble of input signals (total IBO).

IC (Integrated Circuit) – A small device incorporating the equivalent of hundreds or thousands of transistors, capacitors, resistors and other components within a small, solid block.

IC (Interaction Channel)

ICC (International Color Consortium) – 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.

ICCE (International Conference on Consumer Electronics) – Sponsored by the Consumer Electronics Society of the IEEE and held annually in the Chicago area immediately following CES. ATV has become an increasingly important topic at ICCE.

Icon – A small picture that represents a stowed or closed file, directory, application, or IRIX process.

Iconoscope – A camera tube in which a high velocity electron beam scans a photo-emissive mosaic which has electrical storage capability.

ICPM (Incidental Carrier Phase Modulation) – A transmission defect most noticeable as a cause of sync buzz.

ID (Identification Data) – 32-bit field identifying the sector number within the disc volume.

IDE (Integrated Development Environment) – An integrated development environment (IDE) is a programming environment that has been packaged as an application program, typically consisting of a code editor, a compiler, a debugger, and a graphical user interface (GUI) builder. The IDE may be a standalone application or may be included as part of one or more existing and compatible applications. The BASIC programming language, for example, can be used within Microsoft Office applications, which makes it possible to write a WordBasic program within the Microsoft Word application. IDEs provide a user-friendly framework for many modern programming languages, such as Visual Basic, Java, and PowerBuilder.

IDE (Interface Device Electronics) – Software and hardware communication standard for interconnecting peripheral devices to a computer.

IDTV – See Improved Definition Television.

IEC (International Electrotechnical Commission) – The IEC and its affiliated International Organization for Standardization (ISO) are the two major global standards-making groups. They are concerned with establishing standards that promote interchange of products, agreement upon methods of evaluation, and resolution of nonfunctional differences among national standards. They are structured as an international federation of the more than 50 national standards organizations. The USA is represented by the American National Standards Institute (ANSI).

IEC 60461 – Defines the longitudinal (LTC) and vertical interval timecode (VITC) for NTSC and PAL video systems. LTC requires an entire field time to transfer timecode information, using a separate track. VITC uses one scan line each field during the vertical blanking interval.

IEC 60958 – Defines a serial digital audio interface for consumer (SPDF) and professional applications.

IEC 61834 – Defines the DV standard.

IEC 61880 – Defines the widescreen signaling (WSS) information for NTSC video signals. WSS may be present on lines 20 and 283.

IEC 61883 – Defines the methods for transferring data, audio, DV and MPEG-2 data per IEEE 1394.

IEC 62107 – Defines the Super VideoCD standard.

IEEE – See International Electrical and Electronic Engineers.

IEEE 1394 – A high-speed "daisy-chained" serial interface. Digital audio, video and data can be transferred with either a guaranteed bandwidth or a guaranteed latency. It is hot-pluggable, and uses a small 6-pin or 4-pin connector, with the 6-pin connector providing power.

IEEE P1394 (FireWire) – A low-cost digital interface organized by Apple Computer as a desktop LAN and developed by the IEEE P1394 Working Group. This interface can transport data at 100, 200 or 400 Mbps. Serial bus management provides overall configuration control of the serial bus in the form of optimizing arbitration timing, guarantee of adequate electrical power for all devices on the bus, assignment of which IEEE P1394 device is the cycle master, assignment of isochronous channel ID and notification of errors. There are two types of IEEE P1394 data transfer: asynchronous and isochronous. Asynchronous transport is the traditional computer memory-mapped, load and store interface. Data requests are sent to a specific address and an acknowledgment is returned. In addition to an architecture that scales with silicon technology, IEEE P1394 features a unique isochronous data channel interface. Isochronous data channels provide guaranteed data transport at a predetermined rate. This is especially important for time-critical multimedia data where just-in-time delivery eliminates the need for costly buffering.

IEEE Standard 511-1979 Video Signal Transmission Measurement of Linear Waveform Distortions – This IEEE standard gives a comprehensive technical discussion of linear waveform distortions.

IETF (Internet Engineering Task Force) – One of the task forces of the Internet Activities Board (IAB). The IETF is responsible for solving the short-term engineering needs of the Internet. It has over 40 working groups.

I-ETS (Interim European Telecommunications Standards) – An interim standard issued by the ETSI.

IF (Intermediate Frequency) – The first state in converting a broadcast television signal into baseband video and audio.

IFFT (Inverse FFT) – Analytical or digital signal processing step that converts frequency domain information into a time domain sequence.

I-Frame (Intra Frame) – One of the three types of frames that are used in MPEG-2 coded signals. The frame in an MPEG sequence, or GOP (Group of Pictures), that contains all the data to recreate a complete image. The original information is compressed using DCT.

IGMP (Internet Group Management Protocol) – This protocol is used in multicasting.

IIM (Interactive Interface Module)

IIOP (Internet Inter-ORB Protocol) – The CORBA message protocol used on a TCP/IP network (Internet, intranet, etc.). CORBA is the industry standard for distributed objects, which allows programs (objects) to be run remotely in a network. IIOP links TCP/IP to CORBA's General Inter-ORB protocol (GIOP), which specifies how CORBA's Object Request Brokers (ORBs) communicate with each other.

IIR (Infinite Impulse Response) – A type of digital filter which has an infinite output response, as opposed to a FIR filter with a finite output response. It needs usually less coefficients to define signal performance than a FIR filter but on the other hand it can become unstable since part of the output is fed back to the input. A common way to express the IIR is:

$$y(n) = x(N) + Y(n-1)$$

i.e., present output = present input + previous output where n = time interval; x = input; y = output.

IIT (Illinois Institute of Technology) – Home of most of the research into the SLSC ATV scheme.

Ikegami – Broadcast equipment manufacturer involved in a number of ATV schemes, including production of HDEP equipment to the SMPTE standard and schemes involving the use of a line doubler either before or after transmission.

iLink – Sony's name for their IEEE 1394 interface.

Illegal Video – a) A video signal that falls outside the appropriate gamut for that format. For instance, the gamut limits for an R', G', B' signal are 0 mV to 700 mV and Y' is 0 mV to 700 mV and P'b/P'r are +/-350 mV. If the signal falls outside of these limits it is an illegal value. **b)** Some colors that exist in the RGB color space can't be represented in the NTSC and PAL video domain. For example, 100% saturated red in the RGB space (which is the red color on full strength and the blue and green colors turned off) can't exist in the NTSC video signal, due to color bandwidth limitations. The NTSC encoder must be able to determine that an illegal color is being generated and stop that from occurring, since it may cause over-saturation and blooming.

Illuminance – Quotient of the luminous flux dFv incident on an element of the surface containing the point by the area dA of the element. The illuminance also is commonly used in a qualitative or general sense to designate the act of illuminating or the state of being illuminated. Units of luminance are lux, foot candle.

IM4DTTV (Integrated Modem for Digital Terrestrial TV) – The IM4DTTV project (2001-2004), aims at demonstrating the feasibility of an integrated DVB-RCT end-to-end solution (base station and user terminal), able to meet the technical and cost requirements of the forthcoming terrestrial interactive TV services.

IMA (Interactive Multimedia Association) – IMA has been active in the definition of the DVD through its DVD Special Interest Group (IMA DVD SIG). The IMA DVD SIG is a committee of DVD manufacturers working for interactive DVDs by establishing requirements and influencing specifications.

IMA ADPCM – The IMA has selected the 4:1 ADPCM audio compression scheme from Intel's DVI as the preferred compressed audio date type for interactive media platforms. Intel had offered the algorithm as an open standard to the IMA. The algorithm compresses 16-bit audio data at up to 44.1 kHz sampling into 4-bit ADPCM words.

Image – A two dimensional (usually) picture. The picture may be represented in digital form or mathematically as an image is a set of planes in two dimensions. The two dimensions are the resolution in X and Y (columns, lines). The origin (0, 0) of the image is sometimes its lower left corner. There are four basic types of images: black & white or color, mask or no mask, Z plane or no Z plane, IPR information or no IPR information.

Image Buffer – See Frame Buffer.

Image Capture – The transducing of the information in a real image into the photographic or electronic medium. Normally in motion-reproducing systems, synchronous audio information is simultaneously transduced.

Image Compression – a) Process used to reduce the amount of memory required to store an image. See JPEG, MPEG and Decimation. **b)** Application of an appropriate transfer function to the image signal so as to limit dynamic range. **c)** Application of bandwidth limiting or bit rate reduction to an image signal in order to bring it within the limitations of a lower capacity channel.

Image Enhancement – a) Techniques for increasing apparent sharpness without increasing actual resolution. This usually takes the form of increasing the brightness change at edges. Since image enhancement has advanced continuously for nearly 50 years, ordinary NTSC pictures sometimes look better than the NTSC pictures derived from an HDEP source, particularly when these derived pictures are designed to be augmented by other signals in an ATV receiver. It is very difficult to enhance pictures for NTSC receivers and then unenhance them for receivers with augmentation. **b)** Once the camera response has been made flat to 400 lines (by aperture correction), an additional correction is applied to increase the depth of modulation in the range of 250 to 300 lines (in an NTSC system), both vertically and horizontally. This additional correction, known as image enhancement, produces a correction signal with symmetrical overshoots around transitions in the picture. Image enhancement must be used very sparingly, if natural appearance is to be maintained.

Image Enhancer – A device used to sharpen transition lines in a video picture.

Image File – A format for storing digital images. To save disk space, images are compressed in a binary file. The image format is contained in a file header which is read by all the programs. The header contains: the image name, the resolution, the type of image.

Image File Architecture – The Digital Information Exchange Task Force (SMPTE, IEEE, ATSC) on digital image architecture has as its goal the multidisciplinary agreement upon and the definition of fully flexible, interoperable, scalable, and extensible systems. The objective is agreement on the structure of digital image files that will facilitate the exchange of such files across the technology interfaces. The scope includes both the rapid, unambiguous but concise identification of the file and its utilization, as well as the organization of the image data itself.

Image File Descriptor – The descriptor is a block of data that enhances the utility of the main data for the user. It may contain, in standardized format, data concerning production, ownership, access, previous processing, etc., relevant to the basic interpretation of the data.

Image File Header – The header is a very compact label that can be decoded by a universally accepted algorithm. Specific objectives are: identify encoding standard, specify length of the file, indicate whether a readable descriptor is included, permit random interception of data stream, and offer optional error protection.

Image File Header/Descriptor – A standard introductory identification directing access to a digital image file. The header provides a brief image file identification, universally decodable, indicating the format and length of the data block. The (optional) descriptor conveys additional information improving the usefulness of the data block to the user, such as cryptographic, priority, or additional error-protection information as well as source, time, authorship, ownership, restrictions on use, processing performed, etc.

Image File Motion-Picture Format – SMPTE Working Group H19.16 has proposed SMPTE Standard H19.161 defining the file format for the exchange of digital motion-picture information on a variety of media between computer-based systems. This flexible file format describes pixel-based (raster) images with attributes defined in the binary file descriptor, which identifies: generic file information, image information, data format, and image orientation information, motion-picture and television industry, specific information, user defined information. The draft assumes non real-time application, with formats for real-time to be considered as the developing technology permits.

Image File Video Index – Proposed descriptor developed by SMPTE Working Group P18.41. This proposed SMPTE recommended practice is intended to provide a method of coding video index information in which various picture and program related source data can be carried in conjunction with the video signal. There are three classes of video index data based on type and use of the data. Class 1: Contains information that is required to know how to use the signal. Class 2: Contains heritage information for better usage of the signal. Class 3: Contains other information not required to know how to use the signal.

Image Generation – The creation of an image in the photographic or electronic medium from an image-concept (painted or generated by computer graphics, for example).

Image Independence – See HIIP.

Image Innovator – An optional package which adds additional flags and menus to ADO 100, including Mosaics, Posterization, Solarization and Mask submenu, Target Defocus flag and Background menu, Border flags and Sides submenu.

Image Pac – A multi-resolution image file format developed by Kodak as part of the Photo CD System.

Image Processing, Digital – Digital images are represented by a stream, currently of 8-bit or 10-bit values representing the luminance and chrominance information, or a stream of 8-bit or 10-bit values representing the R', G', and B' information. Image processing sometimes involves multiplication of each digital word by: its proportional contribution to the processed image, a vector to relocate the pixel, an algorithm to change overall image size. To control these processes, additional information may be carried in the alpha channel synchronized to the image. As an example of the process, if an 8-bit sample is multiplied by an 8-bit factor, the product becomes a 16-bit word. At some point, this may have to be rounded or truncated back to 8 bits for the next operation. This introduces slight discrepancies in the result which may be visible as lagged edges, color bleeding, etc. If successive truncations are performed during a sequence of image processing steps, the artifacts frequently become increasingly visible. Good practice calls for maintaining some or all of the "extra bits" throughout as much of the image processing as the facilities permit. Experience has shown that digital image processing provides the fewest distracting artifacts when the R', G', B' signals are first converted to the

linear R, G, B. For complex image processing, and for critical results, the 8-bit encoding may be replaced by 10 bits (or more if that can be accommodated).

Image Quality Evaluation, Interval-Scaled – For comparisons of perceived image quality among significantly different systems, a requirement frequently encountered in electronic production, the technique of interval-scaling is recommended by most students of psycho-physics. Interval scaling gives some indication of the magnitude of preference for one system over another. Observers are asked to place a numerical value upon the perceived differences (either in total or with regard to a specified characteristic such as noise, resolution, color rendition, etc.).

Image Quality Evaluation, Ordinal-Scaled – For comparisons of perceived image quality resulting from a controlled variant within a single system, a requirement encountered when fine-tuning a system, the technique of ordinal-scaling is frequently employed. The ordinal-scale indicates that one image is preferred over another. Observers are asked to evaluate perceived image quality on an established scale, usually of five levels, from excellent to unacceptable. Correlations among isolated tests are sometimes uncertain.

Image Quality Evaluation, Ratio-Scaled – When images that differ significantly in creation, display, and content are being compared and interval-scaling becomes necessary, interpretation of the results become more and more complex as the number of observers is increased. Ratio-scaling provides a means for correlating multiple observations and multiple data sources. Observers are asked to assign a numerical value to perceived image quality (either in total or with regard to a specified characteristic such as noise, resolution, color rendition, etc.). They are also asked to identify numerical values for the best possible image, and the completely unacceptable image. Each is allowed to choose a numerical scale with which the observer feels most comfortable. The relationship between the value for the test image and the two extremes provides a useful ratio. Analyses involving comparisons among observers, comparisons with other systems, correlation of results obtained over periods of time, etc., are made by normalizing each observer's scale (for example, best possible = 100, completely unacceptable = 0).

Image Quality, Objective – The evaluation obtained as a result of objective measurement of the quantitative image parameters (including tone scale, contrast, linearity, colorimetry, resolution, flicker, aliasing, motion artifacts, etc.)

Image Quality, Perceived – The evaluation obtained as a result of subjective judgment of a displayed image by a human observer.

Image Resolution – The fineness or coarseness of an image as it was digitized, measured in Dots Per Inch (DPI), typically from 200 to 400 DPI.

Image Scaling – The full-screen video image must be reduced to fit into a graphics window (usually a fraction of the total computer display area), while at the same time maintaining a clear and complete image. To do this, it is important to remove or avoid visual artifacts and other "noise" such as degradation caused by pixel and line dropping, and interlacing problems from the scaling process. The challenges increase when dealing with moving images and the compression/decompression of large amounts of video data.

Image Stabilization – A camcorder feature which takes out minor picture shakiness, either optically or electronically.

Image Transform – First U.S. organization to modify television scanning for electronic cinematography, utilizing 655 scanning lines per frame at 24 frames per second. Also created ImageVision.

ImageVision – An early HDEP scheme utilizing 655 scanning lines per frame and 24 frames per second, with wide bandwidth video recording and a color subcarrier shifted to a higher frequency. Created and used by Image Transform for electronic cinematography.

Imaging Device – a) The part of the video camera or camcorder that converts light into electrical signals. **b)** A vacuum tube or solid state-device in which the vacuum tube light-sensitive face plate or solid-state light-sensitive array provides an electronic signal from which an image can be created.

Immediate Addressing – In this mode of addressing, the operand contains the value to be operated on, and no address reference is required.

Impact Strength – A measure of the work done in breaking a test sample of tape or base film by subjecting it to a sudden stress.

Impairments – Defects introduced by an ATV scheme.

Impedance (Z) – a) The opposition of a device to current flow. A combination of resistance, inductive reactance and capacitive reactance. When no capacitance or inductance is present, impedance is the same as resistance. **b)** A resistance to signal flow. Microphones and audio mixers are rated for impedance. **c)** A property of all metallic and electrical conductors that describes the total opposition to current flow in an electrical circuit. Resistance, inductance, capacitance and conductance have various influences on the impedance, depending on frequency, dielectric material around conductors, physical relationship between conductors and external factors.

Impedance Matching – A video signal occupies a wide spectrum of frequencies, from nearly DC (0 Hz) to 6 MHz. If the output impedance of either the video source, cable or input impedance of the receiving equipment are not properly matched, a series of problems may arise. Loss of high frequency detail and color information as well as image instability, oscillations, snow, ghost images and component heat-up may result. Proper connections and cable types provide correct impedances. See Load Resistance.

Implicit Scene Description – The representation of the composition information based on the transmission of classes that contains the spatio-temporal relationships between audiovisual objects, as opposed to Explicit Scene Description.

Improved Definition Television (IDTV) – IDTV is different from HDTV in that it uses the standard transmitted (M) NTSC or (B, D, G, H, I) PAL signal. IDTV improves the display of these signals by doing further processing of the signal before displaying it. IDTV offers picture quality substantially improved over conventional receivers, for signals originated in standard 525-line or 625-line format, by processing that involves the use of field store and/or frame store (memory) techniques at the receiver. One example is the use of field or frame memory to implement de-interlacing at the receiver in order to reduce interline twitter compared to that of an inter-

laced display. IDTV techniques are implemented entirely at the receiver and involve no change to picture origination equipment and no change to emission standards.

Impulsive Noise – Short, high-level, unwanted signals that tend to cause a sparkling effect in the picture and/or a percussive effect in the sound. The signal-to-impulsive noise ratio is the ratio, in decibels, of the nominal amplitude of the luminance signal (100 IRE units) to the peak-to-peak amplitude of the noise. Impulsive noise is often caused by motorized appliances and tools.

IMTC (International Multimedia Teleconferencing Consortium) – An international membership organization founded in 1993 as Consortium for Audiographics Teleconferencing Standards (CATS). IMTC contributes to the development of and implements the standards recommendations of the ITU for data and videoconferencing.

IN (Interactive Network)

IN Point – The starting point of an edit. Also called a Mark IN. See also Mark IN/OUT, OUT Point.

In the Can – Describes a scene or program which has been completed. Also, "That's a Wrap".

INA (Interactive Network Adapter) – Central point or hub in broadband networks that receives signals on one set frequency band and retransmits them to another. Every transmission in a broadband network has to go through the INA or head-end. In CATV technology, the head-end is the control center for a cable system where video, audio, and data signals are processed and distributed along the coaxial cable network.

Inband Signaling – Signaling is carried in the same communications channel as the data.

Incident Light – Light arriving at the surface of an object.

Incidental Carrier Phase Modulation (ICPM) – This is a distortion of the picture carrier phase caused by changes in either the chrominance or luminance video signal levels. This distortion is described in degrees using the following definition:

ICPM = arctan (quadrature amplitude/video amplitude)

The picture effects of ICPM will depend on the type of demodulation being used to recover the baseband signal from the transmitted signal. ICPM shows up in synchronously demodulated signals as differential phase and many other types of distortions, but the baseband signal is generally not as seriously affected when envelope detection is used. The effects of ICPM are therefore rarely seen in the picture in home receivers, which typically use envelope detection. However ICPM may manifest itself as an audio buzz at the home receiver. In the intercarrier sound system, the picture carrier is mixed with the FM sound carrier to form the 4.5 MHz sound IF. Audio rate phase modulation in the picture carrier can therefore be transferred into the audio system and heard as a buzzing noise. An unmodulated 5 to 10 stair step signal or unmodulated ramp can be used to test for this distortion.

In-Circuit Emulator (ICE) – Debugging aid that connects to the system under test by plugging into the microprocessor's socket. This allows the ICE to gain full control over the system. Typical features include the ability to set breakpoints, single-step a program, examine and modify registers and memory, and divide memory and I/O between the system under test and the ICE system.

Increment – Adding the value one to the contents of a register or memory location.

Indeo – a) Intel's series of compressor and decompressor technologies for digital video, capable of producing software-only video playback.
b) The Indeo is a video compression/playback technique from Intel. Just like CinePak, playback of Indeo compressed video does not require any special hardware. The Indeo algorithm, which used techniques like vector quantization and run-length coding, is used by various other companies. A video file compressed with Indeo may be played on systems that support either Video for Windows® or QuickTime. The new Indeo Video Interactive (IVI) software incorporates additional features to support interactive applications, and used a hybrid wavelet-based algorithm with bidirectional prediction. IVI may be played on systems that support Video for Windows®, later also QuickTime, without dedicated hardware. Video encoded by IVI may be played at up to 640 x 480 pixels resolution and at up to 30 fps, depending on hardware configuration.

Indeo Video Interactive – Intel's latest compressor and decompressor for digital video, incorporating such special features as transparency, scalability, and local decode. See Indeo Video, Local Decode, Scalability, Transparency.

Indeo-C – The Indeo-C was a compression algorithm in the Personal Conferencing Specification (PCS) from the Personal Conferencing Work Group (PCWG), which was an industry group led by Intel. Due to lacking support by the industry, the PCWG dropped the PCS, and has now consolidated with International Multimedia Teleconferencing Consortium (IMTC) which supports ITU-T Red. H.320 video conferencing. The Indeo-C algorithm did not use vector quantizing, as in Indeo, or a hybrid wavelet-based algorithm, as in Indeo Video Interactive, but used a transform coding called Fast Slant Transform (FST). An FST calculates frequency coefficients of picture blocks, like the DCT used in MPEG, but requires less computational power. Both intra-frame and inter-frame coding with motion estimation was applied in Indeo-C and finally, run-length and Huffman coding.

Independent Television – Television stations that are not affiliated with networks and that do not use the networks as a primary source of their programming.

Index Register – Contains address information used for indexed addressing.

Indexed Addressing – Mode in which the actual address is obtained by adding a displacement to a base address.

Indexing – Creation of a data index to speed up search and retrieval.

Indication Signals – They communicate the status of the functioning of a system.

Indirect Addressing – Addressing a memory location that contains the address of data rather than the data itself.

Industrial/Professional – The grade of audio and video equipment that falls between consumer (low end) and broadcast quality. Industrial/professional equipment is characterized by its durability, serviceability, and more-professional end-result.

Inertia Idler – A rotating guide attached to a heavy flywheel to reduce the effect of varying supply reel friction on tape speed.

Information Services – Broad term used to describe full range of audio, video and data transmission services that can be transmitted over the air or by cable.

Infrared Light – The wavelength of light produced below the visible part of the frequency spectrum.

Initial Object Description – A special object descriptor that allows the receiving terminal to gain access to portions of content encoded according to this specification.

Initial Property Identification (IPI) – A unique identification of one or more elementary streams corresponding to parts of one or more media objects.

Initialization – Setting a system to a known state.

Initialize – a) An auto sequence that causes a machine upon power up to arrive at a default condition. **b)** Record some data on a disk to allow its segments to be recognized by a controller.

Initializing – The setting of the computer edit program to proper operating conditions at the start of the editing session.

Ink Numbers – The frame identification numbers used to conform a film work print. Film composer cut lists and change lists reference ink numbers.

In-Point – a) Beginning of an edit. **b)** The first frame that is recorded. **c)** In-points (and out-points) are used in editing to determine where and how edits are inserted on the record clip, and to determine what part of a source clip is used in an insert or overwrite.

Input – The terminals, jack or receptacle provided for the introduction of an electrical signal or electric power into a device or system.

Input Converter – See Down Converter.

Input Port – Circuit that connects signals from external devices as inputs to the microprocessor system.

Input/Output (I/O) – a) Typically refers to sending information or data signals to and from devices. **b)** Lines or devices used to transfer information outside the system.

INRS – French acronym for the National Scientific Research Institute of the University of Quebec. INRS-Telecommunications shares facilities with Bell Northern Research, sort of Canada's Bell Labs, and has simulated both advanced encoders and ATV schemes on its computer simulation system.

Insert – a) The video that fills a key. Also used to describe the key itself. Insert for most keys is "self", that is, a key that is filled with the same video that cuts the hole. Ampex switchers also allow "matte" fill with an internally generated color and "bus fill" where any bus source may be selected to fill the key. **b)** An edit mode meaning to record a new video over a certain section of an existing video where the entry and exit are both defined and no new time code of control track is recorded.

Insert Edit – An electronic edit in which the existing control track is not replaced during the editing process. The new segment is inserted into program material already recorded on the video tape. Recording new video and/or audio material onto a prerecorded (or striped) tape. Insert edits can be made in any order, unlike assemble edits, which must be made sequentially.

Insert Editing – The process of television post-production that combines audio and video signals on an existing control track.

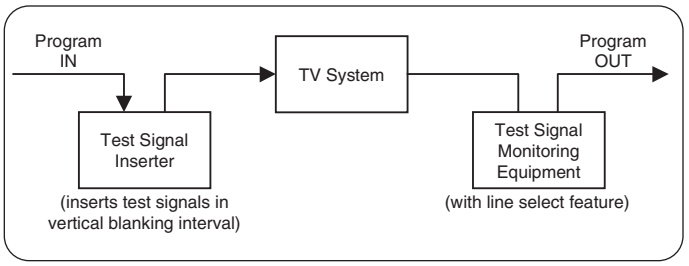
Inserter – A device for providing additional information, normally superimposed on the picture being displayed; this can range from one or two characters to full-screen alphanumeric text. Usually, such generators use the incoming video signal sync pulses as a reference point for the text insertion position, which means if the video signal is of poor quality, the text stability will also be of poor quality. Also known as Alphanumeric Video Generator.

Insertion Gain – In a CAV system, this refers to the overall amplitude of all three signals that make up the CAV signal and is measured as the peak-to-peak voltages of the three video signals (usually including sync on luminance levels).

Insertion Gain Measurement – Measurement of peak-to-peak amplitude values.

Insertion Loss – The decrease in level which occurs when a piece of equipment is inserted into a circuit so that the signal must flow through it.

In-Service (VITS or ITS Mode Testing)



Instance – A clone of an object. If you modify the original, all the instance objects are likewise modified.

Instantaneous Value – The amplitude of a waveform at any one instant of time.

Institute of Electrical and Electronics Engineers – The Institute of Electrical and Electronics Engineers (IEEE) is the world's largest technical professional society. Founded in 1884 by a handful of practitioners of the new electrical engineering discipline, today's Institute includes 46,000 students within a total membership of nearly 320,000 members who conduct and participate in its activities in 150 countries. The men and women of the IEEE are the technical and scientific professionals making the revolutionary engineering advances which are reshaping our world today. And today's students are the future of the profession. The technical objectives of the IEEE focus on advancing the theory and practice of electrical, electronics and computer engineering and computer science. To realize these objectives, the IEEE sponsors nearly 800 Student Branches worldwide, as well as scholarships and awareness programs, technical conferences, symposia and local meetings; publishes nearly 25% of the world's technical papers in electrical, electronics and computer engineering; and provides educational programs to keep its members' knowledge and expertise state-of-the-art. The main IEEE information system is in Piscataway, New Jersey, USA.

Instruction – Single command within a program. Instructions may be arithmetic or logical, may operate on registers, memory, or I/O devices, or may specify control operations. A sequence of instructions is a program.

Instruction Cycle – All of the machine states necessary to fully execute an instruction.

Instruction Decoder – Unit that interprets the program instructions into control signals for the rest of the system.

Instruction Register – Register inside the microprocessor that contains the opcode for the instruction being executed.

Instruction Set – Total group of instructions that can be executed by a given microprocessor. Must be supplied to the user to provide the basic information necessary to assemble a program.

Integrated Services Digital Networks (ISDN) – ISDN is a CCITT term for a relatively new telecommunications service package. ISDN is basically the telephone network turned all-digital end to end, using existing switches and wiring (for the most part) upgraded so that the basic call is a 64 kbps end-to-end channel, with bit manipulation as needed. Packet and maybe frame modes are thrown in for good measure, too, in some places. It's offered by local telephone companies, but most readily in Australia, France, Japan, and Singapore, with the UK and Germany somewhat behind, and USA availability rather spotty. A Basic Rate Interface (BRI) is two 64K bearer (B) channels and a single delta (D) channel. The B channels are used for voice or data, and the D channel is used for signaling and/or X.25 packet networking. This is the variety most likely to be found in residential service. Another flavor of ISDN is Primary Rate Interface (PRI). Inside the US, this consists of 24 channels, usually divided into 23 B channels and 1 D channel, and runs over the same physical interface as T1. Outside of the US then PRI has 31 user channels, usually divided into 30 B channels and 1 D channel. It is typically used for connections such as one between a PBX and a CO or IXC.

Intensity – Synonymous with luminance.

Intensity Stereo Coding – Stereo redundancy in stereo audio is exploited by retaining the energy envelope of the right and left channels at high frequencies only.

Inter – A mode for coding parameters that uses previously coded parameters to construct a prediction.

Inter Shape Coding – Shape coding that uses temporal prediction.

Interactive – Allowing random access to information.

Interactive Television (ITV) – TV programming that features interactive content and enhancements, blending traditional TV viewing with the interactivity of a personal computer.

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. In interactive video, the user's actions, choices, and decisions affect the way in which the program unfolds.

Interactive Videodisc – Interactive videodisc is another video related technology, using an analog approach. It has been available since the early 1980s, and is supplied in the U.S. primarily by Pioneer, Sony, and IBM.

Intercarrier Sound – A method used to recover audio information in the NTSC system. Sound is separated from video by beating the sound carrier against the video carrier, producing a 4.5 MHz IF which contains the sound information.

Intercast – a) An Intel developed process which allows Web pages to be sent in the vertical blanking interval of a (M) NTSC video signal. The process is based on NABTS. **b)** Intercast technology allows television broadcasters to create new interactive content-text, graphics, video, or data around their existing programming and deliver this programming simultaneously with their TV signal to PCs equipped with Intercast technology. Intercast content is created with HTML which means that the interactive content of broadcast with the TV signal appears to the user as Web pages, exactly as if they were using the actual World Wide Web. These broadcast Web pages can also contain imbedded hyperlinks to related information on the actual Internet.

Interchange – Transfer of information between two processes.

Interchannel Timing Error – This error occurs in component analog video three-wire or two-wire interconnect systems when a timing difference develops between signals being transmitted through the wires. The error manifests itself as distortions around vertical lines, edges and in color distortions.

Inter-Coding – Compression that uses redundancy between successive pictures; also known as Temporal Coding.

Interconnect Format – See the Format definition.

Interconnect Standard – See the Standard definition.

Interface – Indicates a boundary between adjacent components, circuits, or systems that enables the devices to exchange information. Also used to describe the circuit that enables the microprocessor to communicate with a peripheral device.

Interference – a) In a signal transmission path, extraneous energy which tends to interfere with the reception of the desired signals. **b)** Defect of signal reproduction caused by a combination of two or more signals that must be separated, whether all are desired or not.

Inter-Frame Coding – a) Coding techniques which involve separating the signal into segments which have changed significantly from the previous frame and segments which have not changed. **b)** Data reduction based on coding the differences between a prediction of the data and the actual data. Motion compensated prediction is typically used, based on reference frames in the past and the future.

Interframe Compression – A form of compression in which the codec compresses the data within one frame relative to others. These relative frames are called delta frames. See Delta Frame, Key Frame. Compare Intraframe Compression.

Interframe Compression Algorithms – MPEG is one of many interframe algorithms that use certain key frames in a motion-prediction, interpolation system.

Interlace – a) Technique for increasing picture repetition rate without increasing base bandwidth by dividing a frame into sequential fields. When first introduced, it also had the characteristic of making the scanning structure much less visible. NTSC uses 2:1 interlace (two fields per frame). **b)** 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 when there was not enough bandwidth to send a complete frame fast enough to create a non-flickering image.

Interlace Artifacts – Picture defects caused by interlace. These include twitter, line crawl, loss of resolution, and motion artifacts. In addition to causing artifacts, interlaced scanning reduces the self-sharpening effect of visible scanning lines and makes vertical image enhancement more difficult to perform.

Interlace Coefficient – A number describing the loss of vertical resolution due to interlace, in addition to any other loss. It is sometimes confused with the Kell factor.

Interlace Ratio – Alternate raster lines are scanned producing an odd field (odd numbered lines) and an even field (even numbered lines). An interlace of 1:1 implies vertically adjacent lines comprise the field.

Interlaced – Display system in which two interleaved fields are used to create one frame. The number of field lines is one-half of the number of frame lines. NTSC (M) systems have 262.5 lines per field. PAL (B, D, G, H, I) scan system have 312.5 lines per field. Each field is drawn on the screen consecutively-first one field, then the other. The field scanned first is called the odd field, the field scanned second is called the even field. The interlaced scanning system is used to prevent screen flicker. If frames where scanned on the screen without interlacing fields, the light level created by the first frame would decrease noticeably before the next frame could be scanned. Interlacing the fields allows the light level of the screen to be held more constant and thus prevent flicker.

Interlaced Carrier – A television subcarrier at a frequency that is an odd multiple of one half the line rate (for example, the NTSC color subcarrier). Such subcarriers fall onto a line in the spatio-temporal spectrum that is simultaneously high in vertical detail and in temporal detail, and is therefore not likely to be objectionably visible under normal viewing conditions.

Interlaced Scanning – a) A scanning process in which each adjacent line belongs to the alternate field. **b)** A technique of combining two television fields in order to produce a full frame. The two fields are composed of only odd and only even lines, which are displayed one after the other but with the physical position of all the lines interleaving each other, hence interlace. This type of television picture creation was proposed in the early days of television to have a minimum amount of information yet achieve flickerless motion. See Interlaced.

Interlaced Sequence – Sequence of pictures, that can be either field picture or frame pictures.

Interlaced Video Mode – A mode in which the video raster is scanned over the face of the CRT by the electron gun tracing alternate scan lines in successive refresh cycles. The quality of interlaced video is lower than sequentially scanned (non-interlaced) video because only half of the lines are refreshed at a time and, interlaced video scans at a lower rate than non-interlaced video allowing for the manufacture of less expensive video monitors. NTSC video (standard TV) uses interlace video. A display system where the even scan lines are refreshed in one vertical cycle (field), and the odd scan lines are refreshed in another vertical cycle. The advantage is that the bandwidth is roughly half that required for a non-interlaced system of the same resolution. This results in less costly hardware. It also may make it possible to display a resolution that would otherwise be impossible on given hardware, The disadvantage of an interlaced system is flicker, especially when displaying objects that are only a single scan line high.

Interlacing – The process of drawing a frame by alternately drawing the rows of each field, creating the illusion that the image is being redrawn twice as often as it actually is. See Field.

Interleaver – The RS-protected transport packets are reshuffled byte by byte by the 12-channel interleaver. Due to this reshuffle, what were neighboring bytes are now separated by at least one protected transport packet. That is, they are at least 204 bytes apart from each other. The purpose of this is the burst error control for defective data blocks.

Interleaving – A technique used with error correction that breaks up burst errors into many smaller errors.

Interline Flicker – See Twitter.

Interline Transfer – This refers to one of the three principles of charge transferring in CCD chips. The other two are frame transfer and frame-interline transfer.

Intermediates – General term for color masters and dupes.

Intermodulation Distortion – Signal nonlinearity characterized by the appearance of frequencies in the output equal to the sums and differences of integral multiples of the component frequencies present in the input signal. Harmonics are usually not included as part of the intermodulation distortion.

Internal Drive – A drive that fits inside the workstation and connects to an internal port; it is never connected with a cable to a visible external port. An internal drive is occasionally referred to as a front-loading drive.

Internal Sync – The internal generation of sync pulses in a camera using a crystal controlled oscillator. This is needed on non-mains power cameras.

International Organization for Standardization (ISO) – This is a Geneva based organization for many of the national standardization bodies. Together with the International Electrotechnical Commission, IEC, ISO concentrates its efforts on harmonizing national standards all over the world. The results of these activities are published as ISO standards. Among them are, for instance, the metric system of units, international stationery sizes, all kinds of bolt nuts, rules for technical drawings, electrical connectors, security regulations, computer protocols, file formats, bicycle components, ID cards, programming languages, International Standard Book Numbers (ISBN). Over 10,000 ISO standards have been published so far and you surely get in contact with a lot of things each day that conform to ISO standards you never heard of. By the way, ISO is not an acronym for the organization in any language. It's a wordplay based on the English/French initials and the Greek-derived prefix iso- meaning same. Within ISO, ISO/IEC Joint Technical Committee 1 (JTC1) deals with information technology.

International Thomson – Name used by France's Thomson group for some recently acquired holdings outside of France. International Thomson is a strong proponent of progressive-scan ATV and has proposed two such schemes for NTSC countries, both of which would offer a 16:9 aspect ratio and 60 frames per second. One would have 900 scanning lines (864 active), matching the number of scanning lines in International Thomson's proposal for non-NTSC countries. The other would have 750 scanning lines (728 active), matching the digitization rates in the non-NTSC proposal.

Interoperability – The capability of providing useful and cost-effective interchange of electronic image, audio, and associated data among different signal formats, among different transmission media, among different applications, among different industries, among different performance levels.

Interpolation – In digital video, the creation of new pixels in the image by some method of mathematically ma-nipulating the values of neighboring pixels. This is necessary when an image is digitally altered, such as when the image is expanded or compressed.

Interpolation (Line) – In television standards conversion, the technique for adjusting the number of lines in a 625-line television system to a 525-line system (and vice versa) without impairing the picture quality.

Interpolation (Movement) – A technique used in standards conversion to compensate for the degrading effects of different field frequencies on pictures which contain movement. Different approximate proportions of successive input fields are used in each output field.

Interpolation (Spatial) – When a digital image is repositioned or resized, different pixels are usually required from those in the original image. Simply replicating or removing pixels causes unwanted artifacts. With interpolation, the new pixels are calculated by making suitably weighted averages of adjacent pixels, giving more transparent results. The quality depends on the techniques used and the area of original picture, expressed as a number of pixels or points. Compare with Interpolation (Temporal).

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 standard converters to reduce the defects caused by the 50/60 Hz field rate difference. This technique can also be adapted to create frame averaging for special effects.

Inter-Positive – A color master positive print.

Interrupt – Involves suspension of the normal program that the microprocessor is executing in order to handle a sudden request for service (interrupt). The processor then jumps from the program it was executing to the interrupt service routine. When the interrupt service routine is completed, control returns to the interrupted program.

Interrupt Mask – Register that has one bit to control each interrupt. Used to selectively disable specific interrupts.

Interrupt Service Routine – Program that is executed when an interrupt occurs.

Interrupt Vectoring – Providing a device ID number or an actual branching address in response to the interrupt acknowledge signal. Allows each interrupt to automatically be serviced by a different routine.

Interval Timer – Programmable device used to perform timing, counting, or delay functions. Usually treated as a peripheral.

Intra – A mode for coding parameters that does not make reference to previously coded parameters to perform the encoding.

Intra Shape Coding – Shape coding that does not use any temporal prediction.

Intra-Coded Pictures (I-Pictures or I-Frames) – Pictures that are coded by using information present only in the picture itself and without depending on information from other pictures. I-pictures provide a mechanism for random access into the compressed video data. I-pictures employ transform coding of the pixel blocks and provide only moderate compression.

Intra-Coding – a) Coding of a macroblock or picture that uses information only from that macroblock or picture. **b)** Compression that works entirely within one picture: also known as Spatial Coding.

Intra-Frame Coding – Video coding within a frame of a video signal.

Intraframe Compression – A form of compression in which the codec compresses the data within one frame relative only to itself. Key frames are compressed with intraframe compression because they must reconstruct an entire image without reference to other frames. See Delta Frame, Key Frame. Compare Interframe Compression.

Intraframe Compression Algorithm – A still image or photo video compression standard. JPEG compression ratios vary from 20:1 to 40:1 with a lossless ratio of 5:1. JPEG is a symmetrical standard inasmuch as it takes the same amount of time to decompress as it does to compress video. JPEG works best with smooth transitions and little motion.

Intrinsic Coercive Force – The magnetizing field strength needed to reduce flux density from saturation to zero.

Intrinsic Coercivity – The maximum value of the intrinsic coercive force. The intrinsic coercivity is a basic magnetic parameter for the material and requires complete saturation of the ample for its measurement as does the saturation flux density.

Intrinsic Flux – In a uniformly magnetized sample of magnetic material, the product of the intrinsic flux density and the cross-sectional area.

Intrinsic Flux Density – In a sample of magnetic material for a given value of the magnetizing field strength, the excess of the normal flux density over the flux density in vacuum.

Intrinsic Hysteresis Loop – Graph of magnetic flux (B) plotted against the magnetizing force (H) producing it. The value of B when H has dropped to zero is the residual magnetism, and the reverse force needed to reduce B to zero is known as the coercivity. Units used are: Magnetizing Force (H) in oersteds and Flux Density (B) in gauss. Coercivity is measured in oersteds.

INTSC (Improved NTSC) – A term rarely used to describe ATV schemes incorporating any combination of techniques.

Techniques to Improve NTSC Compatibility

A. Monochrome and Color
   1. Sampling, Aperture, and Interlace Problems
      - Progressive
      - High Line Rate Display
      - Progressive Camera and Prefiltering
      - High Line Rate Camera and Prefiltering
      - Image Enhancement at the Camera
      - Image Enhancement at the Receiver
   2. Transmission Problems
      - Ghost Elimination
      - Noise Reduction
      - Improved Filter Design and Adjustment
   3. Changing Equipment Problems
      - Gamma Correction
      - Adaptive Emphasis
      - Rigid Adherence to Standards

B. Color Problems
   1. Improved Decoder Filtering
   2. Prefiltering
   3. Full Detail Decoders
   4. Luminance Detail Derived from Pre-Encoded Chroma

Invar – This is an expensive, brittle metal used to make the shadow mask in a direct view color picture tube. Incorporating it allows higher picture contrast levels from the tube without incurring long-term damage to the shadow mask itself. It allows the set manufacturer to offer higher contrast levels. Since the phosphors in the tube reach the point of blooming well before the need for the Invar mask, anyone properly setting the contrast level for no blooming in the picture won't ever need the features of the Invar mask. The high contrast levels permitted by the Invar mask will eventually burn the phosphors.

Inverse Multiplexing – Operation that combines (bonds together) multiple channels to increase the net available bandwidth into a single larger bandwidth channel.

Inverse Non-Additive Mix – A mixing process that compares the color values of the corresponding pixels in the two source clips, and assigns the higher value to the corresponding pixel in the output clip.

Inverse Nyquist Filter – A filter that is a complement of the filter used to reduce interference in the IF section of a television set.

Inverse Quantization (Q-1) – Rescaling the quantized values in order to recover the original quantized values.

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

Inverted Key – We think of a normal key as, for example, letters superimposed over a background. When this key is inverted, the background appears inside the key; it appears we are looking through the cut-out key and seeing the background. The key insert video appears outside the key.

IO (Image Orthicon) – The picture forming tube in a TV camera.

Ion – A charged atom, usually an atom of residual gas in an electron tube.

Ion Spot – A spot on the fluorescent surface of a cathode ray tube, which is somewhat darker than the surrounding area because of bombardment by negative ions which reduce the phosphor sensitivity.

Ion Trap – An arrangement of magnetic fields and apertures which will allow an electron beam to pass through but will obstruct the passage of ions.

IOR (Interoperable Object Reference)

IP (Internet Protocol) – a) IP is the basic language of the Internet. It was developed by the government for use in internetworking multiple computer networks together. **b)** The Network Layer protocol for the Internet protocol suite.

IP Address – The number that uniquely identifies each host (system) on the network.

IP Datagram – Basic unit of information that passes across a connectionless TCP/IP Internet. It contains routing source and destination addresses with the data.

IP Multicast – A system for sending IP transmissions out only one time, but allowing for multiple users to receive it. This would reduce the bandwidth required for audio and video broadcasting over the Internet, but it is not widely used yet.

IP (Index of Protection) – A numbering system that describes the quality of protection of an enclosure from outside influences, such as moisture, dust and impact.

IPCP (Internet Protocol Control Protocol) – Protocol that establishes and configures IP over PPP.

IPI (Intellectual Property Identification) – The IPI descriptor is a vehicle to convey standardized identifiers for content like international standard book number, international standard music number, or digital object identifier if so desired by the content author. If multiple media objects within one MPEG-4 session are identified by the same IPI information, the IPI descriptor may consist just of a pointer to another elementary stream, using its ES ID, that carries the IPI information.

I-Picture (Intra-Coded Picture) – One of three types of digital pictures in an MPEG data stream. An I-picture is not predictive and is essentially a snapshot picture. This type of picture generally has the most data of any of the picture types. A picture coded using information only from itself. For that reason, an I-picture can be decoded separately.

IPMP (Intellectual Property Management and Protection) – The Intellectual Property Management and Protection (IPMP) identifies carriers of creative works. The tool was developed as a complement of MPEG-4, the ISO compression standard for digital audio-visual material. Involved experts, notably those representing authors' societies, felt that MPEG-4 needed extra rules designed to protect intellectual property. To this end, IPMP was constructed as a supplementary layer on the standard.

IPR (Intellectual Property Rights) – The conditions under which the information created by one party may be appreciated by another party.

IPS (Inches Per Second) – The measurement of the speed of tape passing by a read/write head or paper passing through a pen plotter.

IQ (In-Phase/Quadrature Components) – Color difference signals used in NTSC systems.

U = 0.492 (B_-Y)

V = 0.877 (R_-Y)

I = V cos 33º _-U sin 33º

Q = V sin 33º _-U cos 33º

IQTV (Improved Quality Television) – A rarely used term for IDTV and INTSC.

IR (Infrared) – An invisible band of radiation at the upper end of the electromagnetic spectrum. It starts at the middle of the microwave spectrum and goes up to the beginning of visible light. Infrared transmission requires an unobstructed line of sight between transmitter and receiver. It is used for wireless transmission between computer devices as well as most remote controls for TVs and stereo equipment.

IR Light – Infrared light, invisible to the human eye. It usually refers to wavelengths longer than 700 nm. Monochrome (B/W) cameras have extremely high sensitivity in the infrared region of the light spectrum.

IRD (Integrated Receiver Decoder) – a) A combined RF receiver and MPEG decoder that is used to adapt a TV set to digital transmissions. **b)** An IRD with digital interface has the ability to decode partial transport streams (TS) received from a digital interface connected to digital bitstream storage device such as a digital VCR, in addition to providing the functionality of a baseline IRD.

IrDA (Infrared Data Association) – A membership organization founded in 1993 and dedicated to developing standards for wireless, infrared transmission systems between computers.

IRE (Institute of Radio Engineers) – a) The composite analog television signal's amplitude can be described in volts or IRE units with 140 IRE representing a full amplitude composite analog signal. The 0 IRE point is at blanking level, with sync tip at -40 IRE and white extending to +100 IRE In the studio, the composite analog video signal is typically 1 volt in amplitude. Thus in the studio, 1 IRE is equal to 1/140 of a volt or 7.14 mV. IRE stands for Institute of Radio Engineers, the organization which defined the unit. **b)** Unit of video measurement. 140 IRE measures the peak-to-peak amplitude of the video signal (including sync) and is typically 1 volt.

IRE Roll-Off – The IRE standard oscilloscope frequency response characteristic for measurement of level. This characteristic is such that at 2 MHz the response is approximately 3.5 dB below that in the flat (low frequency) portion of the spectrum, and cuts off slowly.

IRE Scale – An oscilloscope or waveform monitor scale conforming to IRE Standard 50, IRE 23.S1 and the recommendations of the Joint Committee of TV Broadcasters and Manufacturers for Coordination of Video Levels.

IRE Units – a) A linear scale for measuring the relative amplitudes of the various components of a television signal. Reference white is assigned a value of 100, blanking a value of 0. **b)** The values for NTSC composite and for SMPTE 240M are shown in the following table. One IRE unit corresponds to 7-1/7 mV in CCIR System M/NTSC and to 7.0 mV in all other systems. Measurement procedure developed by the Institute of Radio Engineers, the predecessor to the IEEE.

	IRE Units	RF Modulation(1) %	Video Baseband Millivolts(2) M/NTSC	SMPTE 24
Zero Carrier	120	0	–	–
White Clip (3)	105-110	6.2-9.4	–	–
Reference White (4)	100	12.5	715 (5)	700
Reference Black (6)	7.5	70.3	54	0
Blanking	0	75	0	0
Sync Peaks (Max Carrier)	–40	100	–286 (5)	±350

(1) From Benson: Television Engineering Handbook.
(2) Video waveform specified in ANSI/EIA/TIA 25D-C-1989. It becomes an operational requirement to map the scene luminance within the video waveform specifications so that subjectively acceptable image recreation can be obtained on display.
(3) Typical (arbitrary) values to limit overload of analog signals, or to define maximum digital equivalent.
(4) Under scene illumination, the light from a nonselective diffuse reflector (white card) whose reflectance factor is 90% compared to a "perfect reflector" (prepared magnesium oxide = 98%).
(5) Frequently indicated as +700 and –300, respectively.
(6) Specified for NTSC in ANSI/EIA/TIA 250-C-1989. Many other systems place reference black at blanking level.

Iredale, Richard – Creator of the HD-NTSC ATV scheme and the HD-PRO HDEP scheme.

IRIG (Inter-Range Instrumentation Group) – Has recently been renamed "Range Control Council".

Iris – a) The video camera's lens opening which regulates the amount of light entering a camera. **b)** A means of controlling the size of a lens aperture and therefore the amount of light passing through the lens.

IRIS – Any graphics workstation manufactured by Silicon Graphics, Inc.

IRIX – Silicon Graphics, Inc.'s version of the UNIX operating system. See also System Software.

Iron Oxide/Gamma Ferric Oxide – The most popular oxide particle used as a magnetic recording medium produced from an oxide of pure iron.

IRT (Institut für Rundfunktechnik) – IRT is the research and development branch of the public broadcasters in Germany (the ARD and ZDF), Austria (the ORF) and in Switzerland (the SRG). Situated in Munich, Germany, the IRT participates in both national and international research projects, and is highly involved in broadcasting system development. Specifically, IRT has participated in the development of digital audio bit rate reduction, and is one of the three licensors of MPEG Layer II of which the IRT conducts conformance tests.

IS (International Standard) – The series of standards from ISO and its subcommittees.

IS&T (Society for Imaging Science and Technology) – An international non-profit organization whose goal is to keep members aware of the latest scientific and technological developments in the field of imaging through conferences, journals and other publications. We focus on imaging in all its aspects, with particular emphasis on silver halide, digital printing, electronic imaging, photo finishing, image preservation, image assessment, pre-press technologies and hybrid imaging systems.

ISA (Industry Standard Architecture) – Originally designed around the 16-bit 286 microprocessor and called the AT bus, the ISA bus has 24 address and 16 data lines, sufficient to handle 16 megabyte memory I/O addresses. The ISA bus is limited to a slow 8 MHz clock speed and for this reason, faster peripherals and memory left the ISA bus behind soon after its development. Unlike the earlier 8-bit PC/XT bus, the ISA bus includes two connectors. In addition to the single, 62-pin, 8-bit PC/XT bus connector, the ISA bus includes a second connector with four additional address and eight additional data lines, interrupt, and DMA control lines. Although IBM documented every pin on the ISA bus, they never published strict timing specifications to signals on the bus. As a result, ISA bus system developers designing products for many platforms had to guess at timing. Problems developed as a result of holding the ISA bus to 8 MHz for backward compatibility. Some anxious manufacturers pushed the system speed causing products with marginal operations characteristics, especially when extra memory was added to high-speed PCs. Since the IEEE ISA standard of 1987, the bus signals have remained unchanged. In 1993, Intel and Microsoft announced a joint development, Plug and Play ISA, a method for making expansion boards work with the ISA bus, eliminating the need for DIP switch settings, jumpers, interrupts, DMA channels, ports, and ROM ranges. The Plug and Play card tells the host computer what resources it requires. This requires a large software-based isolation protocol which keeps an expansion board switched off until it can be addressed, allowing one card to be polled at a time because slot-specific-address enable signals for expansion cards are not part of the ISA specification. In 1987, the ISA bus made way for the IBM PS/2 "clone-killer" computer "Micro Channel" bus however, the clone makers initially ignored the PS/2 and Micro Channel.

ISA Slot – Connection slot to a type of computer expansion bus formerly found in most computers. It is larger in size than the PCI slots found on most Pentium based computers and provides connections to the slower ISA bus.

ISA Transfer – One of the advantages of an ISA transfer is that it allows the user to process images as they go through the processor. However, its utility is limited by its low bandwidth, Even under ideal conditions, the ISA transfer requires three to five BCLK cycles at 8 MHz to transfer a single pixel. This represents a severe system throughput penalty; a large percentage of the available (and already limited) bandwidth is consumed by the transfer.

ISDB (Integrated Services Digital Broadcasting) – Japan's transmission specification for digital broadcasting. ISDB uses a new transmission scheme called BST-OFDM that ensures the flexible use of transmission capacity and service expandability in addition to the benefits of OFDM. Since OFDM uses a large number of carriers that are digitally modulated. It provides sufficient transmission quality under multipath interference. The basic approach of BST-OFDM is that a transmitting signal consists of the required number of narrow band OFDM blocks called BST-segments, each with a bandwidth of 100 kHz.

ISDB (Integrated Services Digital Broadcasting) – An NHK-suggested broadcast equivalent to ISDN.

ISDN – See Integrated Services Digital Network.

ISI (Inter Symbol Interference) – Inter Symbol Interference is the interference between adjacent pulses of a transmitted code.

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. The ISMA specification defines the exact features of the MPEG-4 standard that have to be implemented on the server, client and intermediate components to ensure interoperability between the entire streaming workflow. Similarly, it also defines the exact features and the selected formats of the RTP, RTSP, and SDP standards that have to be implemented. The ISMA v1.0 specification defines two hierarchical profiles. Profile 0 is aimed to stream audio/video content on wireless and narrowband networks to low-complexity devices, such as cell phones or PDAs, that have limited viewing and audio capabilities. Profile 1 is aimed to stream content over broadband-quality networks to provide the end user with a richer viewing experience. Profile 1 is targeted to more powerful devices, such as set-top boxes and personal computers.

ISO – See International Organization for Standardization.

ISO 2202 – Information Processing: ISO 7-bit and 8-bit coded character sets – Code extension techniques

ISO 3166 – Codes for the representation of names of countries.

ISO 3901 – Documentation: International Standard Recording Code (ISRC).

ISO 639 – Codes for the representation of names of languages.

ISO 8859-1 – Information Processing: 8-bit single-byte coded graphic character sets.

ISO 9660 – The international standard for the file system used by CD-ROM. Allows file names of only 8 characters plus a 3-character extension.

ISO Reel – Multiple reels of tape of the same subject recorded simultaneously from different cameras on different VTRs.

ISO/IEC 11172 – Information Technology: Coding of moving pictures and associated audio for digital storage media up to about 1.5 Mbit/s. (MPEG-1)

ISO/IEC 13818 – Information Technology: Generic coding of moving pictures and associated audio. (MPEG-2)

ISO/IEC DIS 13818-3 – Information technology: Generic coding of moving pictures and associated audio.

Isochronous – For digital transmission, events occur with known constant periods. "Equal-time". The synchronization signal is derived from the signal bearing the data.

Isokey – See External Key.

Isolated Key – A key where the "hole cutting" or key video is different from the "key filling" or insert video. This is most commonly used with character generators that provide these two outputs, and allows the character generator to create a key border that is wider and cleaner than internally bordered keys. Such signals may also come from a color camera that provides its own keying output or even a monochrome camera looking at an art card. An isolated key is always a luminance key, although composite chroma keys may be done with an isolated key source, ignoring the isolated input. AVC series switchers can defeat isolated inputs to standard type keys by turning key borders on. Also referred to as a Processed External Key.

Isoparameters – The curves along a surface resulting from setting u or v to a constant value.

ISP (Internet Service Provider) – An organization that provides access to the Internet.

ISV (Independent Software Vendor) – Company which develops and sells application tools and/or software titles.

ISVR Pro – See Smart Video Recorder Pro.

ISVYUV9 – Recording format for decompressed Indeo video technology using VidCap under Microsoft's Video for Windows®.

IT (Information Technology) – Processing information by computer. The latest title for the information processing industry.

Iterative – Procedure or process that repeatedly executes a series of operations until some condition is satisfied. Usually implemented by a loop in a program.

ITFS (Instructional Television Fixed Service) – A method of broadcasting TV programs throughout school systems using low-power high-frequency transmitters.

ITS (Insertion Test Signal) – A test signal that is inserted in one line of the vertical interval to facilitate in-service testing.

ITSTC (Information Technology Steering Committee) – Established by the July 2002 to provide advice and recommendations to the Vice Chancellor on the overall priorities and funding level for information technology and communications for the University of Pittsburgh.

ITTF (Information Technology Task Force) – The United World Colleges (UWC) International Board of Directors created the UWC IT Task Force (ITTF) to coordinate IT development projects for the UWC movement as a whole.

iTTi (International Telecom Union – Telecommunication Sector) – Started in 1998 as part of the ACTS (Advanced Communication Technologies and Services). The project goal was the specification and practical demonstration of a wireless return channel for the terrestrial digital television.

ITU (International Telecommunications Union) – This is the United Nations specialized agency dealing with telecommunications. At present there are 164 member countries. One of its bodies is the International Telegraph and Telephone Consultative Committee, CCITT. A Plenary Assembly of the CCITT, which takes place every few years, draws up a list of 'Questions' about possible improvements in international electronic communication. In Study Groups, experts from different countries develop 'Recommendations' which are published after they have been adopted. Especially relevant to computing are the V series of recommendations on modems (e.g. V.32, V.42), the X series on data networks and OSI (e.g., X.25, X.400), the I and Q series that define ISDN, the Z series that defines specification and programming languages (SDL, CHILL), the T series on text communication (teletext, fax, videotext, ODA) and the H series on digital sound and video encoding.

ITU-R (International Telecommunication Union, Radiocommunication Sector) – Replaces the CCIR.

ITU-R BT.601-2 – a) Standard developed by the International Radio Consultative Committee for the digitization of color video signals. ITU-R BT.601 deals with the conversion from component RGB to YCbCr, the digital filters used for limiting the bandwidth, the sample rate (defined as 13.5 MHz), and the horizontal resolution (720 active samples). **b)** International standard for component digital television from which was derived SMPTE 125M (was RP-125) and EBU 3246E standards. CCIR defines the sampling systems, matrix values, and filter characteristics for both Y, B-Y, R-Y and RGB component digital television.

ITU-R BT.653 – Standard that defines teletext systems used around the world.

ITU-R BT.656 – The physical parallel and serial interconnect scheme for ITU-R BT.601-2. ITU-R BT.656 defines the parallel connector pinouts as well as the blanking, sync, and multiplexing schemes used in both parallel and serial interfaces.

ITU-R BT.709-3 – Part II of the recommendation describes the unique HD-CIF standard of 1080 lines by 1920 samples/line interlace and progressively scanned with an aspect ratio of 16:9 at both 50 Hz and 60 Hz field and frame rates for high definition program production and exchange.

ITU-R.601 – See ITU-R BT.601.2.

ITU-R.624 – ITU standard that defines PAL, NTSC and SECAM.

ITU-T (International Telecommunication Union, Telecommunication Standardization Sector) – International body that develops worldwide standards for telecommunications technologies. The ITU-T carries out the functions of the former CCITT.

ITVA (International Television Association) – An association for media, film, video, and television professionals.

I-vop (Intra-coded VOP) – A vop coded using information only from itself.

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.

IWU (Inter-Working Unit) – The network "modem" where all the digital to analogue (and visa versa) conversions take place within the digital GSM networks

▶ J

J.41 – This is a recommendation from the ITU-T covering high-quality coding of audio material at 384 kbit/s. In the same family we find the J.42, the J.43 and the J.44 recommendations that define the coding of analog "medium quality" sound at 384 kbit/s, "high quality" sound at 320 kbit/s, and "medium quality" sound at 320 kbit/s, respectively.

J.81 – This ITU-T recommendation is identical to the ETSI standard ETS 300 174 for video broadcast transmission at 34 Mbit/s.

Jack – Receptacle for a plug connector leading to the input or output circuit of a tape recorder or other piece of equipment. A jack matches a specific plug.

Jaggies – a) Slang for the stair-step aliasing that appears on diagonal lines. Caused by insufficient filtering, violation of the Nyquist Theory, and/or poor interpolation. **b)** A term for the jagged visual appearance of lines and shapes in raster pictures that results from producing graphics on a grid format. This effect can be reduced by increasing the sample rate in scan conversion.

Jam Sync – a) Process of locking a time-code generator to existing recorded time code on a tape in order to recreate or extend the time code. This may be necessary because, beyond a given point on tape, time code may be non-existent or of poor quality. **b)** Process of synchronizing a secondary time code generator with a selected master time code, i.e., synchronizing the smart slate and the audio time code to the same clock.

Jam Syncing – The process of synchronizing a secondary timecode generator with a selected master timecode.

Japan Broadcasting Corporation – See NHK.

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

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

JBIG – See Joint Bi-Level Image Experts Group.

JBOD (Just a Bunch of Disks) – A collection of optical/magnetic disks used for storing data.

JCIC (Joint Committee for Inter-Society Coordination) – A group comprised of the EIA, the IEEE, the NAB, the NCTA, and the SMPTE. The JCIC created the ATSC in 1982 to handle all of the new advances in TV, including HDTV. The ATSC has since grown to 52 member and observer organizations.

JCTEA (Japan Cable Television Engineering Association)

JEC – Joint Engineering Committee of EIA and NCTA.

Jewel Box – The plastic clamshell case that holds a CD or DVD.

Jitter – a) The variation of a digital signal's significant instants (such as transition points) from their ideal positions in time. Jitter can cause the recovered clock and the data to become momentarily misaligned in time. In some cases the data can be misinterpreted if this misalignment becomes too great. **b)** An undesirable random signal variation with respect to time. A tendency toward lack of synchronization of the picture. It may refer to individual lines in the picture or to the entire field of view. **c)** A rapid, small shift in image position characteristic of film projection. Projection jitter can reduce the apparent resolution of film. **d)** A flickering on a display screen. Besides a monitor or connector malfunction, jitter can be caused by a slow refresh rate.

Jitter Amplitude – The variation in phase of the bit rate clock expressed as a percent of the bit period.

Jitter Rate – The rate of change of the jitter amplitude expressed as a frequency in Hertz.

JND (Just Noticeable Difference) – A measure of the minimum perceptible change in quality. A one JND change is accurately detected 75 percent of the time; a three JND change is accurately detected 99 percent of the time. There is a large number of JNDs of difference between NTSC as it is now received in U.S. homes and high definition electronic production (HDEP). This difference decreases in ATV systems in a hierarchical order. Some feel that a large number of JNDs will be necessary for consumers to purchase new TV sets.

Jog/Shuttle Wheel – A dial on many video decks, VCRs and editing control units that controls jog and shuttle functions.

Jogging – Single-frame forward or backward movement of video tape. See Stepping.

Joint Bi-Level Image Experts Group (JBIG) – This is a lossless bi-level (black and white) image compression technique. JBIG is intended to replace G3 fax algorithms. The JBIG technique can be used on either gray-scaled or color images. Some of the applied techniques have a strong resemblance with the JPEG standard. Commercially available implementations of JBIT have been scarce, but some find use in remote printing of newspapers.

Joint Photographic Expert Group (JPEG) – Compression technique for still images, such as photographs, a single video frame, etc. JPEG can be used to compress motion video however it is not as efficient as MPEG which has been optimized for motion video compression applications.

Joint Stereo Coding – Exploitation of interchannel stereophonic redundancies in audio coding resulting in the left and right stereo pair being coded in a single bitstream.

Jot – The text editor that comes as a standard utility on every IRIS.

Joystick – Affecting control over X, Y and Z parameters. Typical uses are switcher pattern positioner, ADO positioner/controller, ACE switcher preview controller. See Positioner.

JPEG – See Joint Photographic Experts Group.

JPEG-1 – ISO/IEC DIS 10918-1 begins with a digital image in the format Y, CB, CR (such as defined in CCIR 601-2) and provides several levels of compression. Predictive coding and transforms are employed, with the higher compression ratios selectively recognizing the decrease in human visual acuity with increasing spatial frequencies. It is optimized for about 15:1 compression. As increased data storage and increased processing capabilities are becoming available, there is exploration of adapting JPEG-1 for application to successive frames in real time; i.e., full-motion JPEG.

JPEG-2 – ISO/IEC CD 11172 describes procedures for compliance testing in applications of JPEG-1.

JPG – Filename extension for graphic image files stored using JPEG compression.

JScript – A proprietary Microsoft variant of JavaScript.

JTC1 (Joint Technical Committee) – JTC1 is a joint committee of ISO and IEC. The scope of JTC1 is information technology standardization.

Judder – a) Jerkiness of motion associated with presentation rates below the fusion frequency. **b)** A temporal artifact associated with moving images when the image is sampled at one frame rate and converted to a different frame rate for display. As a result, motion vectors in the display may appear to represent discontinuously varying velocities. The subjective effect of the artifact becomes more obvious when the frame-rate conversions are made by simple deletions or repetitions of selected frames (or fields). It may become less obvious when interpolated frames (or fields) are generated by employing predictive algorithms.

Jump – Instruction that results in a change of sequence.

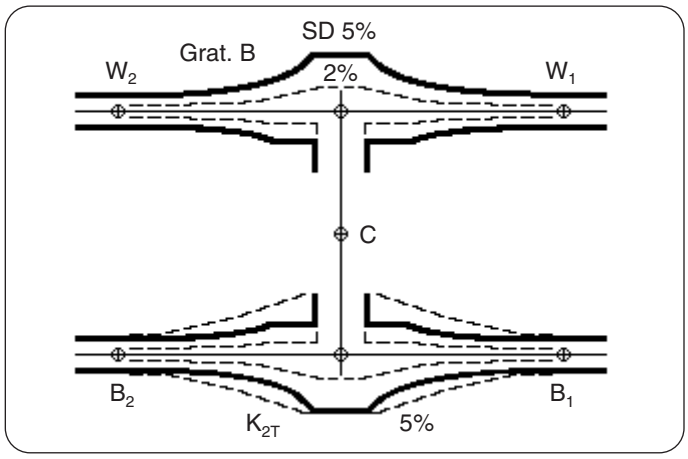
Jump Cut – A mismatched edit that creates a visual disturbance when replayed. Usually occurs when cutting between two images which share an identical subject but place the subject at different positions in the frame.

▶ K

K – Symbol for 1000 (10^3). When referring to bits or words, K=1024 (2^{10}).

K Factor – A specification rating method that gives a higher factor to video disturbances that cause the most observable picture degradation.

K Factor Ratings – K Factor ratings are a system that maps linear distortions of 2T pulses and line time bars onto subjectively determined scales of picture quality. The various distortions are weighted in terms of impairment to the picture.



The usual K Factor measurements are $K_{pulse/bar}$, K_{2T} or K_{pulse} (2T pulse response), K_{bar} and sometimes K_{60Hz}. The overall K Factor rating is the largest value obtained from all of these measurements. Special graticules can be used to obtain the K Factor number or it can be calculated from the appropriate formula. All types of linear distortions affect the K Factor rating. Picture effects may include any of the short time, line time, field time and long time picture distortions. Any signal containing the 2T pulse and an 18 µsec bar can be used to measure $K_{pulse/bar}$, K_{2T} (K_{pulse}), or K_{bar}. A field rate square wave must be used to measure K60Hz. The FCC composite test signal contains these signal components. See the discussion on Pulse to Bar Ratios.

K_{2T} or K-2T – K_{2T} is a weighted function of the amplitude and time of the distortions occurring before and after the 2T pulse. In practice, a graticule is almost always used to quantify this distortion. Different countries and standards use slightly different amplitude weighting factors. The figure to the right shows a typical waveform monitor K Factor graticule display. The outer dotted lines at the bottom of the graticule indicate 5% K2T limits. See the discussion on Pulse to Bar Ratios.

K_{60Hz} – A field-rate square wave is used to measure this parameter. Locate the center of the field bar time, normalize the point to 100% and measure the maximum amplitude deviation for each half. Ignore the first and last 2.5% (about 200 µsec). The largest of the two tilt measurements divided by two is the K60Hz rating.

Karaoke – A special DVD format that allows for certain special features. The audio portion of this format is distinctive in that it is intended for "sing along" formats and may include audio tracks for "guide vocals", "guide melody", "chorus" and the main Karaoke left and right channels. The audio track for Karaoke in DVD-video is defined to be applicable for multi-channel setup with 5 channels maximum. When this vocal part is recorded mainly in track 4 and 5 except the main 2 channels, the users can enjoy many different playback modes by Karaoke type DVD players equipped with various audio on/off switches.

KB – See Kilobyte.

K_{bar} – A line bar (18 µsecs) is used to measure K_{bar}. Locate the center of the bar time, normalize that point to 100% and measure the maximum amplitude deviation for each half. Ignore the first and last 2.5% (0.45 µsec) of the bar. The largest of the two is the Kbar rating.

Keeper – Term used to indicate the effect, edit was good enough to keep, but could possibly be improved on, however, the effect or edit should be stored as is in case it cannot be improved upon.

Kell Effect – Vertical resolution of a scanned image subjectively evaluated is consistently shown to be less than the geometrically-predicted resolution. Observations are usually stated in terms of the ratio of perceived television lines to active lines present in the display. From the time that R. Kelt published his studies (conducted on a progressive scanned image), there have been numerous numerical values and substantiating theories proposed for this effect. The range of results suggests that many details of the experiments influence the result and make defining a single "Kell Factor" impossible. Reported experimental results range at least between 0.5 and 0.9. In an otherwise comparable display, the "ratio" is lower for interlaced scanning than for progressive scanning.

Kell Factor – A number describing the loss of vertical resolution from that expected for the number of active scanning lines, names for Ray Kell, a researcher at RCA Laboratories. Many researchers have come up with different Kell factors for progressively scanned television systems. These differences are based on such factors as aperture shape, image content, and measurement technique. A generally accepted figure for the Kell factor is around 0.68, which, multiplied by the 484 active NTSC scanning lines, yields a vertical resolution of 330 lines, matched by NTSC's 330 lines of horizontal resolution per picture height (see Square Pixels). It is important to note that most studies of the Kell factor measure resolution reduction in a progressive scanning system. Interlaces scanning systems suffer from both a Kell factor and an interlace coefficient.

Kelvin – This is a system or scale used for measuring temperature. Absolute zero is 0° Kelvin or -273°C. 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.

KEM Roll – The roll of film used on a KEM flatbed editing system. A KEM roll combines multiple takes onto a single roll (a work print, not a negative). The maximum length of a KEM roll is 1000 feet.

Kerberos – Kerberos is a network authentication protocol developed by MIT. It is designed to provide strong authentication for client/server applications by using secret-key cryptography.

Kernel – Minimum circuitry required to allow the microprocessor to function. Usually consists of the microprocessor, clock circuit, interrupt and DMA control lines, and power supply.

Kerning – The spacing between text characters in print media, such as titles.

Key – a) A signal that can electronically "cut a hole" in the video picture to allow for insertion of other elements such as text or a smaller video picture. **b)** A video that has been overlaid on top of another video. Keys may be either determined by the luminance or brightness of the key video, or determined by the chroma or hue of the key video. **c)** A push-button. **d)** To combine a selected image from one source with an image from another source. See also Chroma Key.

Key Channel – See Alpha Channel.

Key Color – The solid color used to key.

Key Fill – Line key effects, the video signal which is said to "fill the hole" cut in background video by the key source.

Key Frame – A frame containing all the data representing an image, rather than just the data that has changed since the last frame. The first frame of every video file is a key frame; in addition, they occur throughout the file to refresh image quality and permit certain operations, such as random user access. Compare Delta Frame.

Key Gain – An adjustment for keys that determines the sharpness of the key edges. As key gain is reduced, keys become softer at the edges and may be adjusted to be more transparent.

Key Insert – The video that fills a key.

Key Invert – a) A luminance key mode which inverts the polarity of the key source to allow dark areas of the source video to cut holes in background instead of bright areas. **b)** A chroma key mode which inverts the foreground and background positions.

Key Light – The term used to describe a subject's main source of illumination. When shooting outdoors, the key light is usually the sun.

Key Mask – A key mode which allows use of independent key mask generators to create a pattern to prevent some undesirable portions of the key source from cutting a hole in the background. This is also possible using externally generated masks on the Vista.

Key Matrix – The electronic crosspoints which switch and route key signals and key insert signals to appropriate key processing electronics. On Ampex switchers, these matrices are controlled by keypads and keyer insert selector push-button controls and form the Phantom matrix portion of the switcher.

Key Memory – An AVC series feature that allows a key to be fully adjusted as soon as it is selected. This is accomplished by a "store" button on the key adjust panel that may be pressed when an operator is satisfied with the adjustment of a key. From that point on, whenever that key is selected, regardless of which keyer it is on, all adjustments and features of that key are automatically recalled.

Key Numbers – The original frame identification numbers applied by the film manufacturers to the film stock. Key numbers are used by the negative cutter to conform the film negative. Film composer cut lists and change lists reference key numbers.

Key Region – See Slice.

Key Signal – A hole cutting signal.

Key Source – a) A hole cutter. The signal which is said to "cut a hole" in the background scene for a key effect. In actuality, this signal controls a video mixer which switches between the background scene and the fill video; thus, the key source determines the shape of the key effect. **b)** The image that contains the colors or luminance values on which you key to create a chroma or luminance key effect.

Key Type – There are three key types on Ampex switchers; luminance keys, RGB chroma keys and composite chroma keys.

Keyboard – a) Group of push-buttons used for inputting information to a system. **b)** The human interface portion of a computer, typewriter with alpha numeric keys or push-buttons.

Keyer – a) The electronics and panel controls that create keys. There are many types of keyers, some limited to titles only, and some capable of any type of key. All Ampex keyers are full capability. **b)** A tool that you use to create a composite from a clip from a background and foreground clip by using an input key-in clip to determine how the clips are combined. You use the input key-in clip to create a black and white matte that defines which areas of the foreground and background clips are used in the result clip.

Keyframe – a) Keyframes are important frames that are guides in creating frames that occur between the keyframes. **b)** A specific manipulation or positioning of the image. An effect is composed of one or more keyframes.

Keyframe Duration – The length of the keyframe; the time from keyframe to the start of the next.

Keyframing – The process of creating an animated clip wherein by selecting a beginning image and an ending image the software automatically generates the frames in between. See also Tweening.

Keying – The process of replacing part of one television image with video from anther image; that is chroma keying and insert keying.

Keykode – A trademark of Eastman Kodak Company. A barcode on the edge of motion picture film which allows the film edge numbers to be electronically read and inserted into an edit list. Very useful for generating a negative cut list from a video off-line EDL.

Keykode Numbers Reader – Device attached to a telecine or part of a bench logger which read Keykode number bar code from motion picture film and provides electronic output to a decoder.

Key-Length-Value (KLV) – The grouping of information concerning a single metadata element that combines three pieces of information: its UL Data Key; the Length of its instantiation Value in the next field; its instantiated Value in the allowed format.

Keypad – The numbered push-buttons used to entered numerical data, i.e., pattern numbers, transition rates, key source numbers, etc.

KF Flags (Menu) – Miscellaneous keyframe flags, currently used to turn Globals off and on.

kHz (Kilohertz) – One thousand cycles per second.

Kilobaud – A unit of measurement of data transmission speed equaling 1000 baud.

Kilobyte (KB) – One thousand bytes. Actually 1024 bytes because of the way computer math works out.

Kinescope – a) Frequently used to mean picture tubes in general. However, this name has been copyrighted. **b)** A film recording of a video image displayed on a specially designed television monitor. Only means of recording TV programs before video recorders and tape were invented.

Kinescope Recording – Motion pictures taken of a program photographed directly from images on the face of a kinescope tube. A television transcription.

KLV (Key, Length, and Value) – A data-encoding protocol (SMPTE 336M) that complies with International Standards Organization rules for Object Identifier data and SMPTE Universal Label (SMPTE 298M). This is the "header" information in a metadata stream that will identify the data and which metadata dictionary of definitions should be used for the metadata that follows. KLV and UMIDs (Unique Material Identifiers) are the basic engineering building blocks that have been designed to make metadata easier to exchange between different media (such as tapes or files) and metadata standards.

Knee – By convention, the circuitry introducing white compression into the opto-electric transfer function and thereby modifying the curve for a more gradual approach to white clip.

$K_{pulse/bar}$ or K-PB – Calculation of this parameter requires the measurement of the pulse and bar amplitudes. $K_{pulse/bar}$ is equal to:

$$1/4 \mid (bar-pulse)/pulse \mid X\ 100\%$$

Ku-band – Ku-band satellites use the band of satellite downlink frequencies from 11.7 to 12.2 GHz. Also the group of microwave frequencies from 12 to 18 GHz.

▶ L

Label – Name assigned to a memory location. When an assembly language program is written, a label is assigned to an instruction or memory location that must be referred to by another instruction. Then when the program is converted to machine code, an actual address is assigned to the label.

LAeq – An Leq measurement using A weighting. Refer to Leq and Weighting.

Lambertian Source/Surface – A surface is called a Lambert radiator or reflector (depending whether the surface is a primary or a secondary source of light) if it is a perfectly diffusing surface.

LAN (Local Area Network) – A communications network that serves users within a confined geographical area. It is made up of servers, workstations, a network operating system and a communications link.

LANC – See Control-L.

Land – The raised area of an optical disc.

LAP (Link Access Procedure) – An ITU family of error correction protocols originally derived from the HDLC standard.

LAP-B (Balanced)	Used in X.25 networks.
LAP-D (D Channel)	Used in ISDN data channel.
LAP-M (Modem)	Defined in ITU V.42, which uses some LAPD methods and adds additional ones.
LAP-X (Half-Duplex)	Used in ship to shore transmission.

Lap Dissolve – A slow dissolve in which both pictures are actually overlapped for a very brief period of time. Same as Dissolve.

LAR (Logarithmic Area Ratio) – Describes spectral envelope in speech coding.

Large Scale Integration (LSI) – Technology by which thousands of semiconductor devices are fabricated on a single chip.

Large-Area Flicker – Flicker of the overall image or large parts of it. See also Flicker Frequency and Twitter.

Laser Beam Recording – A technique for recording video on film.

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

Laser – Light amplification by stimulated emission of radiation. A laser produces a very strong and coherent light of a single frequency.

LAT (Link Available Time)

Latch – a) Hardware device that captures information and holds sit (e.g., group of flip-flops). **b)** An electronic circuit that holds a signal on once it has been selected. To latch a signal means to hold it on or off.

Latency – a) The length of time it takes a packet to move from source to destination. **b)** A factor of data access time 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 speeds have tended to increase but there is still much variation. Modern 3-1/2-inch drives typically have spindle speeds of between 3,600 and 7,200 revolutions per minute, so one revolution is completed in 16 or 8 milliseconds (ms) respectively. This is represented in the disk specification as average latency of 8 or 4 ms.

Latent Image – The invisible image formed in a camera or printer by the action of light on a photographic emulsion.

Lateral Direction – Across the width of the tape.

Latitude – In a photographic process, the range of exposure over which substantially correct reproduction is obtained. When the process is represented by and H and D curve, the latitude is the projection on the exposure axis of that part of the curve which approximates a straight line within the tolerance permitted for the purpose at hand.

LATM (Low-Overhead MPEG-4 Audio Transport Multiplex) – MPEG-4 audio is an audio standard that integrates many different types of audio coding tools. Low-overhead MPEG-4 Audio Transport Multiplex (LATM) manages the sequences of audio data with relatively small overhead. In audio-only applications, then, it is desirable for LATM-based MPEG-4 audio bitstreams to be directly mapped onto the RTP packets without using MPEG-4 systems.

Launch – To start up an application, often by double-clicking an icon.

Lavaliere – A microphone designed to hang from the performer's neck.

Layback – Transferring the finished audio track back to the master video tape.

Layer – a) A term used to describe which video is on top of which background versus foreground and subsequent keys superimposed. **b)** One of the levels in the data hierarchy of the video and system specification. **c)** In a scalable hierarchy, denotes one out of the ordered set of bitstreams and (the result of) its associated decoding process. **d)** The plane of a DVD disc on which information is recorded in a pattern of microscopic pits. Each substrate of a disc can contain one or two layers.

Layer 0 – In a dual-layer disc, this is the layer closest to the optical pick-up beam and surface of the disc, and the first to be read when scanning from the beginning of the disc's data. Dual-layer discs are 10% less dense than single layer discs due to crosstalk between the layers.

Layer 1 – In a dual-layer disc, this is the deeper of the two layers, and the second one to be read when scanning from the beginning of the disc's data.

Layered Bitstream – A single bitstream associated to a specific layer (always used in conjunction with layer qualifiers).

Layered Tracks – The elements of an effect created by combining two or more tracks in a specified way, such as nesting one track as a layer within another.

Layer-to-Layer Adhesion – The tendency for adjacent layers of tape in a roll to adhere to each other.

Layer-to-Layer Signal Transfer – The magnetization of a layer of tape in a roll by the field from a nearby recorded layer, sometimes referred to as "print-thru".

LBR (Laser Beam Recorder) – It creates the DVD master file.

LC (Low Complexity) – The most used profile (MPEG-2) or object type (MPEG-4) in AAC (advanced audio coding) encoders and decoders nowadays because of its low system requirements, i.e., CPU and memory resources.

LCD (Liquid Crystal Display) – A screen for displaying text/graphics based on a technology called liquid crystal, where minute currents change the reflectiveness or transparency of selected parts of the screen. The advantages of LCD screens are: very small power consumption (can be easily battery driven) and low price of mass produced units. Its disadvantages presently include narrow viewing angle, somewhat slower response time, invisibility in the dark unless the display is back-lit, difficulties displaying true colors and resolution limitations.

LCP (Link Control Protocol) – See PPP.

L-Cut – See Overlap Edit.

Lead In – On a compact disc, the lead-in contains a table of contents for the track layout.

Lead Out – On a compact disc, the lead-out indicates the end of data.

Leader – a) Special non-magnetic tape that can be spliced to either end of a magnetic tape to prevent damage and possible loss of recorded material and to indicate visually where the recorded portion of the tape begins and ends. **b)** Any film or strip of material used for threading a motion picture machine. Leader may consist of short lengths of blank film attached to the ends of a print to protect the print from damage during the threading of a projector, or it may be a long length of any kind of film which is used to establish the film path in a processing machine before the use of the machine for processing film.

Leading Blacks – A term used to describe a picture condition in which the edge preceding a white object is overshaded toward black. The object appears to have a preceding or leading black border.

Leading Whites – A term used to describe a picture condition in which the edge preceding a black object is overshaded toward white. The object appears to have a preceding or leading white border.

Leakage – A term describing the signal picked up by a mike which is intended to pick up other signals only.

Learn – The act of storing switcher control panel data into memory in a real-time mode (learning as they happen).

Learning Curve – An algebraic metaphor for the amount of time a learner needs to learn a new task (such as operating an item of television production equipment).

Leased Access – Commercial channels made available by a cable operator to third parties for a fee, as required by the Cable Acts of 1984 and 1992.

Least Significant Bit (LSB) – 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 rightmost 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.

Lechner Distance – Named for Bernard Lechner, researcher at RCA Laboratories. The Lechner distance is nine feet, the typical distance Americans sit from television sets, regardless of screen size. The Jackson distance, three meters, named for Richard Jackson, a researcher at Philips in Britain, is similar. There is reason to believe that the Lechner and Jackson distances are why HDTV research was undertaken sooner in Japan (where viewing distances are shorter) than elsewhere. See also Viewing Distance.

LED (Light Emitting Diode) – A light on a piece of hardware that indicates status or error conditions.

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

Legal Signal – A signal in which each component remains within the limits specified for the video signal format; that is, it does not exceed the specified gamut for the current format. For instance, the gamut limits for an R', G', B' signal are 0 mV to 700 mV and Y' is 0 mV to 700 mV and P'b/P'r are +/-350 mV. If the signal remains within these limits the value is legal.

Lempel-Ziv Welch (LZW) Compression – Algorithm used by the UNIX compress command to reduce the size of files, e.g., for archival or transmission. The algorithm relies on repetition of byte sequences(strings) in its input. It maintains a table mapping input strings to their associated output codes. The table initially contains mappings for all possible strings of length one. Input is taken one byte at a time to find the longest initial string present in the table. The code for that string is output and then the string is extended with one more input byte b) A new entry is added to the table mapping the extended string to the next unused code (obtained by incrementing a counter). The process repeats, starting from byte b) The number of bits in an output code, and hence the maximum number of entries in the table is usually fixed and once this limit is reached, no more entries are added.

Length – a) The physical length of the tape wound on a reel or on a hub, varying from 213 feet in a C45 cassette to 9200 feet in a roll of instrumentation tape. **b)** The number of bytes represented by the items whose Length is being described.

Lens – The curved glass on a video camera or camcorder that collects light and focuses it.

Leq – Leq represents the continuous noise level, equivalent in loudness and energy, to the fluctuating sound signal under consideration. Refer to LAeq.

Letterbox – a) An MPEG video term for which the parameters have a defined set of constraints within a particular profile. **b)** A television system that limits the recording or transmission of useful picture information to

about three-quarters of the available vertical picture height of the distribution format (e.g., 525-line) in order to offer program material that has a wide picture aspect ratio. **c)** Term generally used for the form of aspect ratio accommodation involving increasing vertical blanking. See Blanking Adjustment.

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

Letterboxing – A technique that maintains the original wide aspect ratio of film when displayed as video. The top and bottom of the video screen are blackened and the total scene content is maintained.

Level – a) A defined set of constraints on the values which may be taken by some parameters within a particular profile. A profile may contain one or more levels. **b)** In MPEG-2, a range of picture parameters. **c)** Defines the bounds of the coding parameters, such as resolution, bit rate, etc. within each profile. The variation of performance is inherently wide in a profile. Thus, levels have been defined in order to set reasonable constraints. **d)** When relating to a video signal it refers to the video level in volts. In CCTV optics, it refers to the auto iris level setting of the electronics that processes the video signal in order to open or close the iris.

LFE (Low Frequency Effects) – The optional LFE channel (also referred to as the "boom" channel) carries a separate, limited, frequency bandwidth signal that complements the main channels. It delivers bass energy specifically created for subwoofer effects or low-frequency information derived from the other channels. The LFE channel is the ".1" in 5.1-channel audio.

Library – As in a book library, it is somewhere one might keep effects, i.e., on a disk or collection of disks hence a library of canned effects.

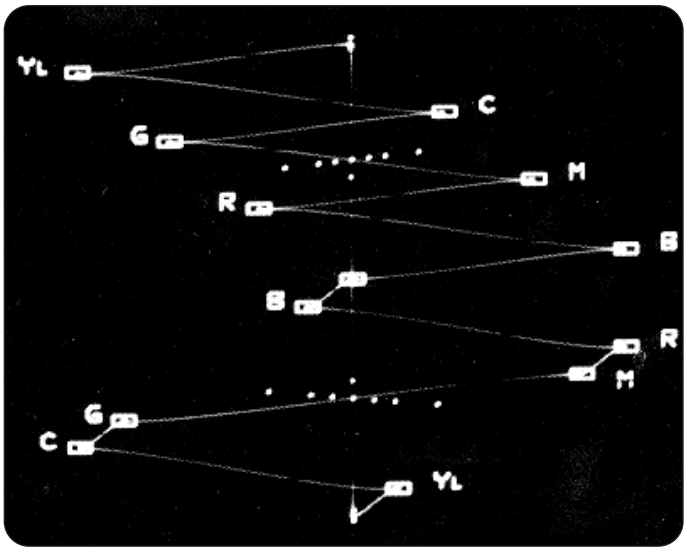
LIFO (Last-In-First-Out) – A buffer. Same as Push-Down Stack. See Stack.

Lift – To remove selected frames from a sequence and leave black or silence in the place of the frames.

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 known 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.

Lightness – The brightness of an area (subjectively) judged relative to the brightness of a similarly illuminated area that appears to be white or highly transmitting.

Lightning Measurement Method – A measurement method that allows for the evaluation of the luma signal gain and for making chroma/luma gain comparisons. It can also provide simple indication of inter-channel timing errors indicated by a bowing in the trace between the green-magenta transition. Tektronix developed this two-dimensional Lightning display, named because of the zigzag trace pattern it produces. This display is created by plotting luminance versus B-Y in the upper half of the display and inverted luminance versus R-Y in the lower half of the display. The bright dot in the center of the screen is the luminance blanking level. The points above and below this show the plots of the different color components based on their signal amplitude. This test requires a color bar test signal be used.



Limiter – a) A compressor with a ratio greater than or equal to 10:1. **b)** 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.

Limiting – Special circuitry is sometimes included in equipment to limit bandwidth or amplitude, i.e., white amplitude in cameras is generally limited. Saturation of matte generators in switchers are generally limited to stop illegal colors.

Line – Same as a horizontal scan line or horizontal line.

Line Blanking – The blanking signal at the end of each horizontal scanning line. Used to make the horizontal retrace invisible. Also called horizontal blanking.

Line Compensation – Use of a video line amplifier to pre-compensate for high frequency video signal transmission losses resulting from long distance cable runs (several hundred meters) by boosting those signal frequencies most effected. Without such compensation, deterioration is manifested as loss of fine details and color distortion.

Line Count – The total number of horizontal lines in the picture.

Line Crawl – Tendency of the eyes to follow the sequentially flashing scanning lines of interlaced scanning up or down the screen in the same way that the eyes follow the sequentially flashing light bulbs on a movie theater marquee. Line crawl tends to reduce vertical resolution.

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

Line Doubling – Any number of schemes to convert interlaced scanning to progressive scanning at the display, the simplest of which simply doubles each scanning line. More elaborate schemes use line interpolation and motion compensation or median filtering.

Line Feed – A recording or live feed of a program that switches between multiple cameras and image sources. Also known in sitcom production as the Director's Cut.

Line Frequency – The number of horizontal scans per second, normally 15,734.26 times per second for NTSC color systems and 15,625 in PAL.

Line Interpolation – An advanced mechanism used in some line doublers that calculates the value of scanning lines to be inserted between existing ones.

Line Locked – a) The sync pulses of cameras are locked to the AC mains frequency. **b)** In CCTV, this usually refers to multiple cameras being powered by a common alternating current (AC) source (either 24 VAC, 110 VAC or 240 VAC) and consequently have field frequencies locked to the same AC source frequency (50 Hz in CCIR systems and 60 Hz in EIA systems).

Line Mode – A Dolby Digital decoder operational mode. The dialnorm reference playback level is -31 dBFS and dynamic range words are used in dynamic range compression. Refer to Dynamic Range Compression.

Line Pair – A measure of resolution often used in film and print media. In television, lines are used instead, creating confusion when comparing film and video.

Line Pair, Optical – In optical measurements and specifications, resolution is specified in terms of line-pairs per unit distance or unit angle, a line pair consisting of one "black" plus one "white" line. Thus one line pair corresponds to two television lines.

Line Pairing – A reduction in vertical resolution caused when a display (or camera) does not correctly space fields, resulting in an overlap of odd and even numbered scanning lines. See also Random Interlace.

Line Powered – A camera in which the power is supplied along the same coaxial cable that carries the video signal.

Line Rate – The rate at which scanning lines appear per second (the number of scanning lines per frame times the frame rate); sometimes used (non-quantitatively) as an indication of the number of scanning lines per frame (e.g., a high line rate camera).

Line Rate Conversion – Standardized video systems currently exist employing the following number of total lines per frame: 525, 625, 1125. Furthermore, each of these operates in a 2:1 interlace mode, with 262.5, 312.5, 562.5 lines per field (with concurrent temporal differences at field rates of 50.00, 59.94, or 60.00 fields per second). Additional systems are being proposed. While simple transcoding by deletion or repetition can be applied, it is more commonly done by applying an algorithm to stored information in order to generate predictive line structures in the target system.

Line Store – A memory buffer which stores a single digital video line. One application for line stores is use with video filtering algorithms or video compression applications.

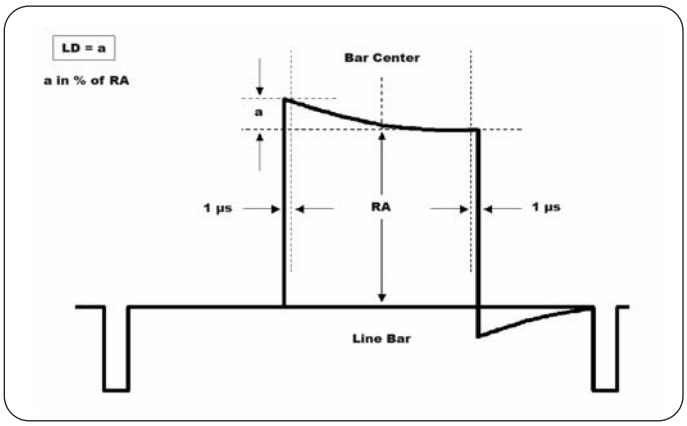
Line Structure Visibility – The ability to see scanning lines. Seeing them makes it harder to see the image (like looking out a window through Venetian blinds or not being able to see the forest for the trees). Some ATV schemes propose blurring the boundary between scanning lines for this reason.

Line Sync – The sync signal pulse transition that defines the start of a scan line. Line sync may be the start of a normal sync or the start of an equalization or broad pulse.

Line Sync Frequency – See Line Frequency.

Line Time – The time interval between OH data or the time taken for a complete scan line. Example: In a PAL system the line time is 64 µs.

Line Time Linear Distortions – Causes tilt in line-rate signal components such as white bars. The amount of distortion is expressed in as a percentage of the amplitude at the center of the line bar amplitude. Distortions involving signals in the 1 µsec to 64 µsec range. Line Time distortions can also be quantified in K_{bar} units. In large pictures details, this distortion produces brightness variations between the left and right sides of the screen. Horizontal streaking and smearing may also be apparent. Any test signal containing an 18 µsec, 100 IRE bar such as the FCC Composite or the NTC-7 Composite can be used for this measurement. See the discussion on Linear Distortions and K_{bar} units.



Line Time Waveform Distortion – See Line Time Linear Distortions.

Linear (Assembly) Editing – Editing using media like tape, in which material must be accessed in order (e.g., to access scene 5 from the beginning of the tape, one must proceed from scene 1 through scene 4). See Nonlinear Editing.

Linear Addressing – This is a modern method of addressing the display memory. The display memory (in the IBM PC world) was originally located in a 128-Kbyte area from A000:0 through BFFF:F, too small for today's display systems with multi-megabyte memories. Linear addressing allows the display memory to be addressed in upper memory, where a large contiguous area is set aside for it.

Linear Distortion – Distortion that is independent of signal amplitude. These distortions occur as a result of the system's inability to uniformly transfer amplitude and phase characteristics at all frequencies. When fast signal components such as transitions and high frequency chrominance

are affected differently than slower line-rate or field-rate information, linear distortions are probably present. These distortions are more commonly caused by imperfect transfer characteristics in the signal path. However linear distortions can also be externally introduced. Signals such as power line hum can couple into the video signal and manifest themselves as distortions.

Linear Editing – A type of tape editing in which you assemble the program from beginning to end. If you require changes, you must re-record everything downstream of the change. The physical nature of the medium (for example, analog videotape) dictates how you place material on the medium. See Nonlinear Editing.

Linear Key – a) A term given to a key which contains soft edges and information at many different luminance levels. This is the ability of the keyer to key many levels linearly and means the keyer has a gain close to one. **b)** A process for the selective overlay of one video image upon another, as through chroma key. Control of the ratio of foreground to background determined by the specifications derived from luminance information, and provided in the linear key data. Ratios to be applied are carried for each picture element in the alpha channel. The process permits realistic rendering of semi-transparent objects.

Linear PCM – One of the allowed types of audio formats for DVD. It may have up to 8 channels and provide very high sample rates and sample depths. Unfortunately, these very high data rates consume so much DVD capacity that meaningful quantities of both audio and video become problematic.

Linear Predictive Coding (LPC) – LPC is a speech coding technique. It models the human vocal tract by producing a time varying filter that predicts the current speech sample from past speech samples.

Linear Pulse Distribution Amplifier (Linear Pulse DA) – A linear pulse distribution amplifier will handle 4 Vp-p signals (pulses) but is limited to amplifying and fanning out the signal. Also see Regenerative Pulse DA.

Linear Select Decoding – Address decoding technique that uses the most significant address bits to directly enable devices in the system.

Linear Time Code (LTC) – Time code recorded on a linear analog track on a videotape. This type of time code can be read only while the tape is moving.

Linearity – a) This is the basic measurement of how well analog to digital and digital to analog conversion are performed. To test for linearity, a mathematically perfect diagonal line is converted and then compared to a copy of itself. The difference between the two lines is calculated to show linearity of the system and is given as a percentage or range of Least Significant Bits. **b)** The uniformity of scanning speed which primarily affects the accuracy of geometry along a horizontal or vertical line through the picture center. **c)** The measurement of how accurately a piece of electronic equipment processes a signal, (a measure of its transparency).

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.

Line-Out Monitor – A monitor connected to a recording device that displays the finished product. A line-out monitor may be a video monitor (video product), an audio speaker (audio product), or a television (both audio and video).

Liners/Friction Plates – Friction controlling plastic sheets used inside a Philips cassette to control winding uniformity and torque level.

Lines – Scanning lines or lines of resolution. The latter are hypothetical lines alternating between white and black (or, in the case of chroma resolution, between complementary colors). The combined maximum number of black and white lines that might be perceived in a particular direction is the number of lines of resolution. Vertical resolution is measured with horizontal lines; horizontal resolution is measured with vertical lines; diagonal resolution is measured with diagonal lines (no current television system or proposal favors one diagonal direction over the other, so the direction of the diagonal lines does not really matter). See also PPH.

Lines, Active Horizontal – In the scanning of a video image, the line number associated with the format is the total number of lines assigned to one frame. It is in fact a timing specification defining the conjunction with the field frequency the time interval allocated to each horizontal line (commonly measured in number of samples at the specified sampling rate or in microseconds). Some of these lines and intervals carry image information, some from the total assigned are dedicated to operational and control functions, including returning the scanning beam back to the upper left corner to begin the next field. Those allotted time intervals (lines) actually carrying image information or image-associated information such as captioning, image test signals, etc., are the active lines. In further reduction of time allocated to image information, some of each active line is dedicated to the horizontal interval to get the scanning beam to return to the left-edge starting point for the next line and to reaffirm color subcarrier, etc. In the U.S. 525/59.94/2:1/NTSC system, about 7.6% of the total field or frame time is assigned to the vertical interval, and about 16% to the horizontal interval. Thus, the 525 television lines per frame provide about 480 active lines. Correspondingly, each active line displays image data about 84% of its time interval. Image information is thus conveyed for only about 76.4% of the total time. In digital encoding, it may be possible to reduce the number of bits assigned to the vertical and horizontal intervals and achieve significant bit rate reduction.

Lines, Active Vertical – In a scanning standard, the number of raster lines per frame that are not required to contain blanking. The active vertical lines may include signals containing non-image information.

Lines, Television – Television images are scanned in a sequence of horizontal lines, beginning at the upper left corner, and reaching the bottom right corner at the end of the field. Thereupon the scan is returned to the upper left corner to begin the next field. As a consequence of the line structure, all television images are sampled vertically. Within a line, the signal may remain analog or be sampled digitally. A television line is also a measure of time, representing the interval allocated to one line. (In the U.S. system 525/59.94/2:1, the line duration is 63.5 s). Television lines also function as a geometric measure, with resolution (both vertical and horizontal), for example, specified in terms of “lines per picture height”. Since both “black” and “white” lines of a resolution chart are counted, two television lines equal one cycle of the electrical waveform.

Link – A Physical Layer communication path.

Lip Synchronization – The absence of noticeable lag or lead between the video and the audio playback.

Liquid Gate – A printing system in which the original is immersed in a suitable liquid at the moment of exposure in order to reduce the effect of surface scratches and abrasions.

List Box – Used to make a selection from a list of options. If the list is too long to fit inside the given area, a vertical scroll bar moves the list up and down.

Listener – Device that inputs data from a data bus.

Little Endian – A process which starts with the low-order byte and ends with the high-order byte. Intel processors use the little endian format.

Live – Actually presented in the studio, with cameras feeding out to the lines as the performance is done.

LLC (Logical Link Control) – In the Open Systems Interconnection (OSI) model of communication, the Logical Link Control Layer is one of two sub-layers of the Data-Link Layer and is concerned with managing traffic (flow and error control) over the physical medium. The Logical Link Control Layer identifies a line protocol, such as SDLC, NetBIOS, or NetWare, and may also assign sequence numbers to frames and track acknowledgements.)

LLME (Lower Layer Management Entity) – Contains the management functions and functions that concern more than one layer.

LMDS (Local Multi-Point Distribution System) – A digital wireless transmission system that works in the 28 GHz range in the U.S. and 24-40 GHz overseas. It requires line of sight between transmitter and receiving antenna, which can be from one to four miles apart depending on weather conditions. LMDS provides bandwidth in the OC-1 to OC-12 range, which is considerably greater than other broadband wireless services. LMDS can be deployed in asymmetric and symmetric configurations. It is designed to provide the "last mile" from a carrier of data services to a large building or complex that is not wired for high-bandwidth communications. In areas without gas or steam pipes or other underground conduits, it is less costly to set up LMDS transceivers on rooftops than to dig up the ground to install optical fiber. See MMDS.

L-Member (Liaison Member) – A term used within ISO/IEC JTC1 committees. A Liaison Organization does not vote.

LNB (Low-Noise Block Converter) – A device hooked to a satellite dish's feedhorn that receives the signal at ~4 or 12 GHz and converts it to a lower frequency for input into a receiver.

LO (Local Origination Channel) – A channel on a cable system (exclusive of broadcast signals) which is programmed by the cable operator and subject to his exclusive control.

Lo/Ro (Left Only, Right Only) – A type of two-channel downmix for multichannel audio programs. Lo/Ro downmixes are intended for applications where surround playback is neither desired nor required.

Load – a) A roll of film stock ready to be placed in the camera for photography. A 1000-foot load is a common standard. **b)** A group of multicamera reels shot at the same time, sharing the same timecode, and numbered accordingly.

Load Resistance – The impedance or resistance (load) that a cable places on a signal being transmitted through it. In the case of a high frequency signal, signal-to-cable matching is essential to prevent signal deterioration. The cable should be terminated by a specific load resistance, usually 50 or 75 ohms. Improper cable loading results in signal distortion, ghost images, color loss and other adverse phenomena. Most video inputs have the proper termination built in.

LOAS (Low Overhead Audio Stream) – This is an audio-only transport format for applications where an MPEG-4 audio object needs to be transmitted and additional transport overhead is an issue.

Local Bus Transfer – The host/local bus transfer consumes a smaller percentage of available bandwidth during video/graphics transfers than earlier bus standards but the still-noticeable performance penalty may be objectionable for some users, especially when compared to systems that circumvent it.

Local Decode – A feature of Indeo video interactive allowing the playback application to tell the codec to decode only a rectangular subregion of the source video image: the viewport. See Viewport.

Local Tally – A tally of which bus on an M/E is active regardless of whether or not it is on air.

Local Workstation, Drive, Disk, File System, or Printer – The physical workstation whose keyboard and mouse you are using, all hardware that is connected to that workstation, and all software that resides on that hardware or its removable media.

Locate (Menu) – The 3D function used to move or relocate an image. Locate moves the image as if it were in three-dimensional space, even though the image is seen on a two-dimensional video screen.

Location – Shooting locale.

Locator – A mark added to a selected frame to qualify a particular location within a sequence. User-defined comments can be added to locators.

Locked – a) A video system is considered to be locked when the receiver is producing horizontal syncs that are in time with the transmitter. **b)** 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.

Locking Range – The time range measured in micro- or nano-seconds over which a video decoder can "lock" or stabilize a signal. Digital out of range signals may require "rubber-band" buffering using a parallel shift register (FIFO) to reduce the locking range.

Lock-Up Time – The time before a machine is activated and the time it is ready for use.

LOD (Level of Detail) – An important mechanism for achieving a high level of performance in a 3D virtual world. It balances the quantity (extent) of an object with its quality (detail). As some measure of the distance between the viewer and the object change, a related change is made in the quantity and quality of the rendering of an object.

LOF (Loss of Frame) – LOF is a generic term with various meanings depending on the signal standards domain in which it is being used. A

SONET port status indicator that activates when an LOF defect occurs and does not clear for an interval of time equal to the alarm integration period, which is typically 2.5 seconds.

Lofting – The ability to stretch a "skin" over shapes that are in fact cross-sectional ribs.

Log – To enter information about your media into bins at the beginning of the editing process. Logging can be done automatically or manually. See Shot Log.

Logarithm – A logarithm is the power to which a base (usually 10) must be raised in order to arrive at the desired value.

Logarithmic Scale – A mathematical function which spreads out low values and squeezes together higher values.

Logic Analyzer – Test system capable of displaying 0s and 1s, as well as performing complex test functions. Logic analyzers typically have 16 to 32 input lines and can store sequences of sixteen or more bits on each of the input lines.

Logic Comparator – Test product that compares pin-for-pin operation of an IC operating in-circuit with a known good reference IC.

Logic Probe – Handheld troubleshooting tool that detects logic state and activity on digital circuit nodes.

Logic Pulser – Handheld troubleshooting tool that injects controlled digital signals into logic nodes.

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

Logical Channel – A virtual connection between peer Multiplex Layer (FlexMux or TransMux) entities. It has associated parameters relating to its priority or error resilience tools applied to the Adaption Layer packets to be transported in this logical channel.

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

Logical Value – A description of the memory blocks disks used for the frame store.

Login – To log in to a workstation is to establish a connection to the workstation and to identify yourself as an authorized user.

Login Account – A database of information about each user that, at the minimum, consists of login name, user ID, and a home directory.

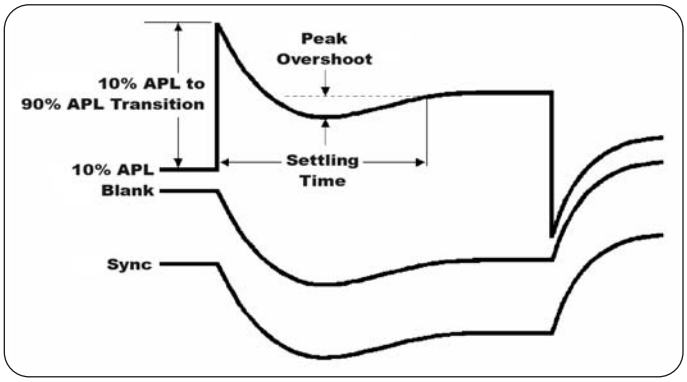
Login Name – A name that uniquely identifies a user to the system.

Login Screen – The window that you see after powering on the system, before you can access files and directories.

Logout – To log out from a workstation is to finish a connection to the workstation.

Long Shot – Camera view of a subject or scene, usually from a distance, showing a broad perspective.

Long Time Distortion – The low frequency transient resulting from a change in APL. This distortion usually appears as a very low frequency damped oscillation. The peak overshoot, in IRE, is generally quoted as the amount of distortion. Setting time is also sometimes measured.



Long Time Linear Distortions – Distortions involving signals in the greater-than-16 msec range. Long time distortions affect slowly varying aspects of the signal such as changes in APL which occur at intervals of a few seconds. The affected signal components range in duration from 16 msecs to tens of seconds. The peak overshoot, in IRE, which occurs as a result of an APL change is generally quoted as the amount of distortion. Settling time is also sometimes measured. Long time distortions are slow enough that they are often perceived as flicker in the picture. See the discussion on Linear Distortions.

Longitudinal Curvature – Any deviation from straightness of a length of tape.

Longitudinal Direction – Along the length of the tape.

L**ongitudinal Time Code (LTC) –** Audio rate time code information that is stored on its own audio track. This audio rate signal allows the editing system to track the position of the tape even at high shuttle speeds where VITC data could not be used.

Look Ahead Preview – See Preview.

Lookup Table (LUT) – Files used to convert color information in an image.

Loop – Piece of tape spliced beginning (head) to end (tail) for continuous playback or recording. To fold around. A loop/slack section of film with the necessary "play" to allow film which had been previously and continuously moving from a reel to be intermittently moved through a grate/projection head/optical lens arrangement. Proper loop size is important in threading a film projector, i.e., in telecine for film to videotape transfer.

Loop Filter – Used in a PLL design to smooth out tiny inaccuracies in the output of the phase comparator that might drive the loop out of lock. The loop filter helps to determine how well the loop locks, how long it takes to lock and how easy it is to cause the loop out of lock.

Loop Frame Store – The principal is that a series of video frames is compressed and stored in a continuous loop. This records a certain number of frames and then records over them again until an alarm signal is received. When this happens it carries on recording for a dozen frames or so and then stops. This means that frames before and after the incident are

recorded. This eliminates the boring searching through hours of videotape and concentrates on the period of activity.

Loop Through – A video signal entering a piece of equipment is returned to the outside world for further use. Loop through circuitry requires careful design to prevent signal degradation.

Looping – a) A term used to describe the chaining of a video signal through several video devices (distribution amplifiers, VCRs, monitors, etc.). A VCR may be hooked up to a distribution amplifier which is supplied with a video input connector and a loop output connector. When a signal is fed to the distribution amplifier, it is also fed unprocessed to the loop output connector (parallel connection) on the distribution amplifier. In turn, the same signal is fed to another device which is attached to the first one and so on. Thus a very large number of VCRs or other video devices can be looped together for multiple processing. **b)** An input that includes two connectors. One connector accepts the input signal, and the other connector is used as an output for connecting the input signal to another piece of equipment or to a monitor.

Loss – Reduction in signal strength or level.

Lossless (Compression) – a) Reducing the bandwidth required for transmission of a given data rate without loss of any data. **b)** Image compression where the recovered image is identical to the original. **c)** The reconstructed data is degraded relative to the source material by the method of removal of redundant information from the media while compressing. See Lossy (Compression).

Lossy (Compression) – a) Image compression where the recovered image is different from the original. **b)** Compression after which some portion of the original data cannot be recovered with decompression. Such compression is still useful because the human eye is more sensitive to some kinds of information than others, and therefore does not necessarily notice the difference between the original and the decompressed image. **c)** Reducing the total data rate by discarding data that is not critical. Both the video and audio for DTV transmission will use lossy compression. See Lossless (Compression).

Low Band Color – The old, original professional videotape color recording.

Low Delay – A video sequence does not include B-pictures when the low delay flag is set; consequently, the pictures follow in chronological order, and low delay is obtained. Normally, when B-pictures are included, the pictures used for prediction of a B-picture are sent in advance so they are available when the B-picture arrives, but this increases the delay.

Low End – The lowest frequency of a signal. See High End.

Low Impedance Mike – A mike designed to be fed into an amplifier or transformer with input impedance of 150 to 250 ohms.

Low Key – A scene is reproduced in a low key if the tone range of the reproduction is largely in the high density portion of the H and D scale of the process.

Lower Layer – A relative reference to the layer immediately below a given Enhancement Layer (implicitly including decoding of all layers below this Enhancement Layer).

LowFER – One who experiments with radio communication at unusually low frequencies (typically 1750 meters, which is 160-90 kHz and can be used under FCC Part 15).

Low-Frequency Amplitude Distortion – A variation in amplitude level that occurs as a function of frequencies below 1 MHz.

Low-Frequency Distortion – Distortion effects which occur at low frequency. Generally considered as any frequency below the 15.75 kc line frequency.

Low-Order – Pertaining to the weight or significance assigned to the digits of a number. In the number 123456, the lower order digit is six. The three low-order bits of the binary word 11100101 are 101.

Lowpass Filter – a) Filter that passes frequencies below a specific frequency. **b)** A filter specifically designed to remove frequencies above the cutoff frequency, and allow those below to pass unprocessed is called a lowpass filter. The effect of a lowpass filter is to reduce the amplitude of high frequencies. Common examples include the “treble” controls on many lower end radios and stereos, the passive “tone” controls often found on electric guitars and basses, hi-cut filters on consoles, and of course, this type of filter is found on many synthesizers.

LPC (Linear Predictive Coding) – An encoding technique used to aid in the prediction of the next sample. This technique can be found in many analogue to digital conversion processes.

LPCM (Linear Pulse Code Modulation) – A pulse code modulation system in which the signal is converted directly to a PCM word without companding, or other processing. Refer to PCM.

LPTV (Low Power TV) – LPTV stations provide their communities with local programming, covering events and issues in a smaller area than most TV stations. There were licensed in the United States, 2,190 LPTV stations as of July 1, 1999. As LPTV signals are comparatively weak, LPTV stations don’t generally interfere with larger TV stations using the same frequency.

LS/RS (Left Surround, Right Surround) – The actual channels or speakers delivering discrete surround program material.

LSB – See Least Significant Bit.

LSI – See Large Scale Integration.

LSP (Line Spectral Pairs) – An alternative representation of linear predictor coefficients. LSPs have very good quantization properties for use in speech coding systems.

LSTTL (Low Power Schottky TTL) – Digital integrated circuits that employ Schottky diodes for improved speed/power performance over standard TTL.

Lt/Rt (Left Total, Right Total) – Two-channel delivery format for Dolby Surround. Four channels of audio, Left, Center, Right and Surround (LCRS) are matrix encoded for two-channel delivery (Lt/Rt). Lt/Rt encoded programs are decoded using Dolby Surround and Dolby Surround Pro Logic decoders. Refer to Dolby Surround and Dolby Surround Pro Logic.

LTC – See Linear Time Code or Longitudinal Time Code.

LTP (Long Term Prediction) – A method to detect the innovation in the voice signal. Since the voice signal contains many redundant voice segments, we can detect these redundancies and only send information about the changes in the signal from one segment to the next. This is accomplished by comparing the speech samples of the current segment on a sample by sample basis to the reconstructed speech samples from the previous segments to obtain the innovation information and an indicator of the error in the prediction.

LTS (Lifetime Time Stamp) – Gives the duration (in milliseconds) an object should be displayed in a scene. LTS is implicit in some cases such as a video sequence where a frame is displayed for 1/frame-rate or until the next frame is available, whichever is larger. An explicit LTS is necessary when displaying graphics and text. An audiovisual object should be decoded only once for use during its life time.

Luma – See the definition for Luminance.

Luma (Component) – A matrix, block or single pel representing a monochrome representation of the signal and related to the primary colors in the manner defined in the bit stream. The symbol used for luma is Y.

Luma Bandpass – A filter used to pass luma information only. It is used for the same purpose as a chroma bandpass filter. See Chroma Bandpass.

Luma Delay – Luma delay is used in PAL/NTSC encoding and color decoding in TV systems and processing of luminance in VTRs. The Y signal occupies a greater bandwidth than the low definition, narrowband chroma. This also means that the signal is delayed less as the bandwidth of a circuit increases. Without a delay, the chroma would be printed slightly later than the corresponding luminance signal.

Lumakey – When keying one image onto another, if the composition is based on a combination of luminance and brightness values, it constitutes a lumakey.

Lumen (lu) – A light intensity produced by the luminosity of one candela in one radian of a solid angle.

Luminance (Y) – Video originates with linear-light (tristimulus) RGB primary components, conventionally contained in the range 0 (black) to +1 (white). From the RGB triple, three gamma-corrected primary signals are computed; each is essentially the 0.45-power of the corresponding tristimulus value, similar to a square-root function. In a practical system such as a television camera, however, in order to minimize noise in the dark regions of the picture it is necessary to limit the slope (gain) of the curve near black. It is now standard to limit gain to 4.5 below a tristimulus value of +0.018, and to stretch the remainder of the curve to place the Y-intercept at -0.099 in order to maintain function and tangent continuity at the breakpoint:

Rgamma = (1.099 * pow(R,0.45)) – 0.099

Ggamma = (1.099 * pow(G,o.45) – 0.099

Bgamma = (1.099 * pow (B,0.45) – 0.099

Luma is then computed as a weighted sum of the gamma-corrected primaries.

Y = 0.299 * Rgamma + 0.587 * Ggamma + 0.114 * Bgamma

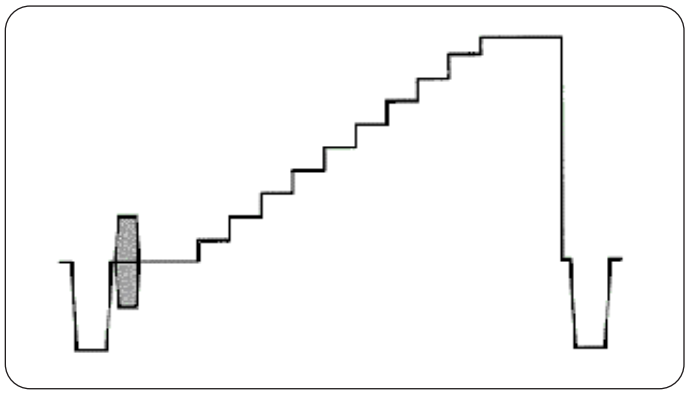
The three coefficients in this equation correspond to the sensitivity of human vision to each of the RGB primaries standardized for video. For example, the low value of the blue coefficient is a consequence of saturated blue colors being perceived as having low brightness. The luma coefficients are also a function of the white point (or chromaticity of reference white). Computer users commonly have a white point with a color temperature in the range of 9300 K, which contains twice as much blue as the daylight reference CIE D65 used in television. This is reflected in pictures and monitors that look too blue. Although television primaries have changed over the years since the adoption of the NTSC standard in 1953, the coefficients of the luma equation for 525 and 625 line video have remained unchanged. For HDTV, the primaries are different and the luma coefficients have been standardized with somewhat different values. The signal which represents brightness, or the amount of light in the picture. This is the only signal required for black and white pictures, and for color systems it is obtained as the weighted sum (Y = 0.3R + 0.59G + 0.11B) of the R, G and B signals.

Luminance Factor b – At a surface element of a non self-radiating medium, in a given direction, under specified conditions of illumination, ratio of the luminance of the surface element in the given direction to that of a perfect reflecting or transmitting diffuser identically illuminated. No “perfect reflectors” exist, but properly prepared magnesium oxide has a luminance factor equal to 98% and this is usually employed to define the scale.

Luminance Key – A key wherein the keying signal is derived from the instantaneous luminance of a video signal after chroma has been filtered out. That is, for a particular clip level, all parts of a scene that are brighter than that level will appear keyed in, leaving background video everywhere else.

Luminance Noise – Noise which manifests itself in a video picture as white snow, typically caused by one of the following situations: low signal level due to poor lighting conditions, poor video signal processing, low quality videotapes, excessively long video cables used without pre-compensation, dirt on the video recorder heads which interferes with reading and writing, over-enhancement of the video signal.

Luminance Nonlinearity – Present if luminance gain is affected by luminance levels. This amplitude distortion is a result of the system's inability to uniformly process luminance information over the entire amplitude range. This distortion is also called differential luminance.



The amount of luminance nonlinearity distortion is expressed as a percentage. Measurements are made by comparing the amplitudes of the individual steps in a staircase signal as shown. The result is the difference between the largest and smallest steps, expressed as a percentage of the largest step. Measurements should be made at both high and low APL and the worst error should be quoted. In black and white pictures, luminance nonlinearity will cause pictures loss of detail in shadows and highlights which are caused by the crushing or clipping of the white or black portions of the signal. In color pictures, luminance nonlinearity will cause colors in the high luminance portions of the picture to be distorted.

Luminance Range – The range in measured luminance between the lightest and the darkest element of a luminous scene or its display.

Luminance Range, Display CRT – The luminance range that can be displayed on a CRT is the ratio of maximum to minimum luminance on the tube face. The maximum practical output is determined by beam current, phosphor efficiency, shadow-mask distortion, etc. The minimum is the luminance of that portion of the tube face being scanned with beam current set to cut-off. The contributions from room illumination, external and internal reflections, etc., must be recognized.

Luminance Range, Display Theater – The luminance range that can be displayed on a theater projection screen is the ratio of maximum to minimum luminance achievable during projection of film. The maximum achievable highlight is determined by light-source output capacity, projection optical efficiency, the transmission of minimum film densities, screen gain, etc. The minimum is the luminance contribution from house illumination and other stray light, plus optical flare raising black levels, and the transmission of maximum film densities. Measured values in typical first-run theaters show luminance ranges of 500:1 to 300:1 (usually limited by house illumination).

Luminance Range, Recorded – The luminance range, recorded may be reduced from the luminance range, scene intentionally and/or by the limitations of the recording system. Most systems have a maximum effective signal level limiting the high end, and noise limiting the low end. All of the scene that is of interest must be placed within these two limits by the choice of an appropriate transfer function. Some analog functions permit gradual transitions to overload and/or noise. Digital functions have inflexible limits imposed by the number of levels permitted by the bit assignments.

Luminance Range, Scene – The luminance range of original scenes varies from outdoor scenes in sunlight with a range possibly exceeding 10000:1, to indoor scenes with controlled lighting, where the range may be reduced to 10:1 or even less. Adjustment of or accommodation to the luminance range, scene is one of the conditions to be evaluated in determining how the scene is to be recorded. It is a test of artistic judgment to place the relative luminances for the objects of interest on a suitable portion of the opto-electronic or opto-photographic transfer function in order to produce the desired subjective quality.

Luminance Signal – The black and white signal (the brightness signal) in color TV. The luminance signal is formed by combining a proportion of 30% red, 50% green and 11% blue from the color signal. This combined output becomes the luminance (brightness/monochrome) signal.

Luminance, Constant (Video) – In an image coding system that derives a luminance signal and two bandwidth-limited color-difference signals, constant luminance prevails if all of the luminance information is encoded into one signal that is supplemented by but totally independent of two color signals carrying only chrominance information, e.g., hue and saturation. Constant luminance is only achieved when the luminance and chrominance vectors are derived from linear signals. The introduction of nonlinear transform characteristics (usually for better signal-to-noise and control of dynamic range prior to bandwidth reduction) before creating the luminance and chrominance vectors destroys constant luminance. Current video systems do not reconstitute the luminance and chrominance signals in their linear form before further processing and, therefore, depart from constant luminance. Note: When R, G, B information is required to be recovered from the set of luminance and color-difference signals, the values correlated to the original signals are obtained only if the luminance and chrominance signals have been derived from the linear functions of R, G, B or have been transformed back to linear. Constant luminance not only provides a minimum of subjective noise in the display (since the luminance channel does not respond to chrominance noise), but also preserves this noise minimum through chrominance transformations.

Luminance, Physics (Generic Usage) – a) Luminance has technical as well as colloquial definitions. The generic flux from a light-emitting or light-reflecting surface; the subjective response to luminance is brightness. The quotient of the luminous flux at an element of the surface surrounding the point and propagated in directions defined by an elementary cone containing the given direction, by the product of the solid angle of the cone and the area of the orthogonal projection of the element of the surface on a plane perpendicular to the given direction. **b)** The luminous flux may be leaving, passing through, and arriving at the surface or both. The luminance for each element of a surface within the field of view is defined as the ratio of luminous flux per solid angle to the unit projected area of the surface. Units are candelas per square meter, foot lamberts, nits.

Luminance, Relative, Scene – A convenient linear scale for measuring in arbitrary units the relative luminance amplitudes within the scene, to be recorded in a video or photographic image, as shown below. The relative luminance scale is one factor affecting the choice of suitably artistic scene reproduction. It may establish the optimum rendition of reference white and optimum employment of the nonlinear transfer function in image recording. Note: This relative luminance scale (linear in luminance) resembles IRE units (linear in voltage) in positioning both black level reference and reference white at 0 and 100, respectively, but that it differs in recognizing the extended luminance range of many commonly encountered scenes.

Correlation of Relative Scene Luminance

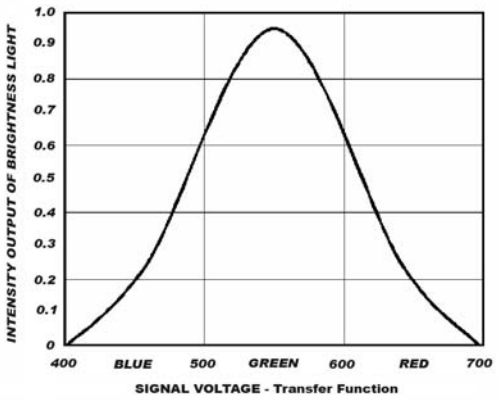
	Reflectance Factor %	Relative Scene Luminance (1) Scale	Relative Camera Stops
Typical Limit of Interest	–	640	+5
–	320	+4	
–	160	+3	
Reference White (2)	90	100	–
–	80	+2	
–	40	+1	
Gray Card (3)	18	20	0
–	10	1	
–	5	–2	
Scene Black	0	0	–

(1) IEEE Dictionary of Electrical and Electronics Terms defines luminance factor as the ratio to a perfect reflector rather than as the ratio to reference white. In practical electronic production, relative scene luminance is a more useful measure.
(2) Under scene illumination, the light from a nonselective diffuse reflector (white card) whose reflectance is 90% compared to a perfect reflector (prepared magnesium oxide = 98%).
(3) Under scene illumination, the light from a nonselective diffuse reflector (gray card) whose reflectance is 18% compared with that of a perfect reflector.

Luminance, Television – a) When television was monochrome and sensors were in approximate conformance to CIE Photopic Spectral Luminous Efficiency Function, it became common to think of the video signal as the luminance signal. With the introduction of color, a matrix was designed to develop a luminance function by weighting the R, G, B signals in accordance with the CIE Photopic Spectral Luminance Efficiency Function, producing a video signal compatible with monochrome receivers. **b)** A signal that has major control of the image luminance. It is a linear combination of gamma-corrected primary color signals. **c)** The specific ratio of color primaries that provides a match to the white point in a specified color space. d) The definition of luminance, television is identical for NTSC, PAL, and SECAM (CCIR Report 624-4), as follows: E'Y = (0.299) E'R + (0.587) E'G + (0.014) E'B. The weighting function is named luminance signal in all of the television standards. For convenience and bandwidth conservation, however, it is always formed from the gamma correction signals (i.e., R', G', B') and not from the initial linear signals, and thus it is not an exact representation of luminance, physics.

Luminescence – The absorption of energy by matter and its following emission as light. If the light follows and then completes itself quickly after absorption of the energy, the term fluorescence is used. If the process is of a longer and more persistent length, the term phosphorescence is applied.

Luminosity Curve – A function that expresses the apparent brightness of the spectral colors. It is used in video systems to calculate the luminance signal.



Luminous Flux – a) The time rate of flow of light. **b)** The time rate of flow of radiant energy evaluated in terms of a standardized visual response. Unless otherwise indicated, the luminous flux is defined for photopic vision. The unit of flux is the lumen: the luminous flux emitted within unit solid angle by a point source having an isotropic luminous intensity of 1 candela.

LUT (Look-Up Table) – A cross-reference table in the computer memory that transforms raw information from the scanner or computer and corrects values to compensate for weakness in equipment or for differences in emulsion types.

Lux (lx) – a) The metric unit for illumination is 1 lumen per square meter. 1 foot candle = 10.76 Lux. **b)** A measurement of light. Lux is used in television production to determine the minimum amount of light (lux rating) needed for camera operation. Hence, a "2 lux" camcorder requires less light than a "4 lux" camcorder.

LV (LaserVision) – Technology used in optical video disk.

LVDS (Low Voltage Differential Signal) – A transmission method defined by DVB for sending digital information in parallel mode The specification within EN50083-9 describes a 25-pin type D connector using differential lines. The lines consist of a clock, eight data lines, packet sync, and a data-valid line. LVDS has been widely used in laptops to send signals from the motherboard to the flat panel display, because it uses fewer wires. The technology is also used between the image scaler and the panel in some stand-alone flat panel displays such as SGI's popular 1600SW flat panel.

▶ M

M – The CCIR designation for 525 scanning-line/30 frame-per-second television. U.S. color television is internationally designated NTSC-M. The M standard is the world's second oldest (the oldest was a 405-line/25 frame British standard, no longer broadcast).

M and E Tracks – a) Stands for music and effects audio tracks. **b)** The common designation for a single sound track containing music and sound effects but not dialog.

M Load – The cassette tape loading mechanism used in VHS videotape recorder/playback technology.

M/E – See Mix Effects.

M/E Reentries – Those buttons on a bus that allow selection of previous M/Es for further processing to be overlaid.

M/E to M/E Copy – A panel memory enhancement allowing the operator with three keystrokes to copy all parameters from one M/E to another.

M/E to M/E Swap – A panel memory enhancement allowing the operator with three keystrokes to swap all parameters between two M/Es. All parameters include key clip levels, pattern position, all hues and modifiers used as long as the M/Es are similarly equipped.

M2 – See Miller Squared Code.

M4IF (MPEG-4 Industry Forum) – The MPEG-4 Industry Forum starts where the MPEG ends, i.e., dealing with all issues related to practical implementations of the theoretical standards set by the MPEG in commercial applications.

MAA (MPEG ATM Adaptation)

MAC (Multiplexed Analog Components) – a) A system in which the components are time multiplexed into one channel using time domain techniques; that is the components are kept separate by being sent at different times through the same channel. There are many different MAC formats and standards. **b)** A means of time multiplexing component analog video down a single transmission channel such as coax, fiber or a satellite channel. Usually involves digital processes to achieve the time compression. **c)** A large family of television signal formats sharing the following "two characteristics: color remains in a component rather than composite form, and luminance and chrominance components are time compressed so that active line time remains constant, with chrominance following luminance. Most of the MACs also include digital audio/data channels. Since they are non-composite, MACs do not suffer from any cross-luminance or cross-color effects. Since they are time compressed, they tend to have a greater base bandwidth than composite signals. See also ACLE, A-MAC, B-MAC, D-MAC, D-MAC, D2-MAC, HD-MAC, HD-MAC60, MAC-60, MUSE and S-MAC.

MAC-60 – An early version of the HDMAC-60.

Machine Code – See Machine Language.

Machine Cycle – Basic period of time required to manipulate data in a system.

Machine Error – A machine hardware malfunction.

Machine Language – Binary language (often represented in hexadecimal) that is directly understood by the processor. All other programming languages must be translated into binary code before they can be entered into the processor.

Machine Operator – A person trained in the operation of a specific machine.

Macro Lens – A lens used for videography when the camera-to-object distance is less than two feet. The macro lens is usually installed within the zoom lens of the video camera or camcorder.

Macroblock – a) The four 8 by 8 blocks of luminance data and the two (for 4:2:0 chroma format), four (for 4:2:2 chroma format) or eight (for 4:4:4 chroma format) corresponding 8 by 8 blocks of chrominance data coming from a 16 by 16 section of the luminance component of the picture. Macroblock is sometimes used to refer to the pel data and sometimes to the coded representation of the pel values and other data elements defined in the macroblock header. The usage should be clear from the context. **b)** The screen area represented by several luminance and color-difference DCT blocks that are all steered by one motion vector. **c)** The entity used for motion estimation, consisting of four blocks of luminance components and a number of corresponding chrominance components depending on the video format.

Macrovision – An analog protection scheme developed by Macrovision for the prevention of analog copying. It is widely used in VHS and has now been applied to DVD.

Mag Track – This term usually refers to the sound track. It is usually used only in reference to the separate sound tape used in double system recording and editing. Videotape is a magnetic medium too, but the term mag track is only used in reference to sound tape and not to sound on a videotape picture.

Magnetic Density – The amount of magnetic flux within a specific area.

Magnetic Field – An area under the influence of magnetism.

Magnetic Film – Sprocketed base with a magnetic coating for audio recording and playback.

Magnetic Force – The amount of magnetic influence/force within a specific area/field.

Magnetic Head – That part of a videotape recorder which converts electric variations into magnetic variations and vice versa.

Magnetic Induction – To magnetize by being put within the magnetic influence of a magnetic field.

Magnetic Instability – The property of a magnetic material that causes variations in the residual flux density of a tape to occur with temperature, time and/or mechanical flexing. Magnetic instability is a function of particle size, magnetization and anisotropy.

Magnetic Recording – The technology and process of recording audio/video information using magnetism as the medium for storage of information. The term is often used to mean the process/capability of both recording and reproduction/playback.

Magnetic Tape – With a few exceptions, magnetic tape consists of a base film coated with magnetic particles held in a binder. The magnetic particles are usually of a circular shape and approach single domain size. See Gamma Ferric Oxide, Chromium Dioxide and Cobalt Doped Oxide.

Magnetic Track – A sound-track recorded on magnetic film or tape.

Magnetism – The property of certain physical materials to exert a force on other physical materials, and to cause voltage to be induced in conducting bodies moving relative to the magnetized body.

Magnetizing Field Strength, H – The instantaneous strength of the magnetic field applied to a sample of magnetic material.

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

Main Channel – The basic transmission channel of an ATV channel utilizing an augmentation channel.

Main data – User data portion of each sector. 2048 bytes.

Main Level – A range of allowed picture parameters defined by the MPEG-2 video coding specification with maximum resolution equivalent to ITU-R Recommendation 601. MPEG-2 standard has four level which define the resolution of the picture, ranging from SIF to HDTV and five profiles which determine the set of compression tools used. The four levels can be described as:

1. Low Level: SIF resolution used in MPEG-1 (up to 360 x 288 pixels)
2. Main Level: Using 4:2:0 standard (720 x 576 pixels)
3. High 1440 Level: Aimed at HDTV (up to 1440 x 1152 pixels)
4. High Level: Wide screen HDTV (up to 1920 x 1152 pixels)

Main Profile – A subset of the syntax of the MPEG-2 video coding specification that is expected to be supported over a large range of applications. MPEG-2 standard uses four levels which define picture resolution and five profiles which define the compression tools used.

MPEG Levels and Profile

	Simple	Main	SNR	Spatial	High
High		4:2:0 1920 x 1152 80 Mbits/s I, B, P			4:2:0 or 4:2:2 1920 x 1152 100 Mbits/s I, B, P
High 1440		4:2:0 1440 x 1152 60 Mbits/s I, B, P		4:2:0 1440 x 1152 60 Mbits/s I, B, P	4:2:0 or 4:2:2 1440 x 1152 80 Mbits/s I, B, P
Main	4:2:0 720 x 576 15 Mbits/s I, B	4:2:0 720 x 576 15 Mbits/s I, B, P	4:2:0 720 x 576 15 Mbits/s I, B, P		4:2:0 or 4:2:2 720 x 576 20 Mbits/s I, B, P
Low		4:2:0 360 x 288 4 Mbits/s I, B, P	4:2:0 360 x 288 4 Mbits/s I, B, P		

(1) Simple Profile: Defined in order to simpify the encoder and the decoder at the expense of a higher bit rate.
(2) Main Profile: Best compromise with current technology between rate and cost.
(3) SNR Profile: A quality tradeoff is made against SNR performance. A low bit rate decoderwill have full resolution but will have lesssignal-to-noise ratio than a high bit rate one.
(4) Spatial Profile: A tradeoff against spacial resolution. The low bit rate receiver produces a picture with less resolution than the full bit rate one.
(5) High Profile: Intended for HDTV broadcast applications in 4:2:0 or 4:2:2.

Main Visual Profile – Adds support for coding of interlaced, semitransparent, and sprite objects to the Core Visual Profile. It is useful for interactive and entertainment-quality broadcast and DVD applications.

Male Connector – A connector that has raised edges, pins, or other protruding parts that you plug into a female connector. An example of a male connector is an electrical plug that you plug into a wall outlet.

MAN (Metropolitan Area Network) – Network that spans a metropolitan area. Generally, a MAN spans a larger geographic area than a LAN, but a smaller geographic area than a WAN.

Man Page – An on-line document that describes how to use a particular IRIX or UNIX command.

Mantissa – Fractional value used as part of a floating point number. For example, the mantissa in the number 0.9873 x 107 is 0.9873.

Manual Iris – A manual method of varying the size of a lens's aperture.

Mapping – a) A technique for taking a 2D image and applying (mapping) it as a surface onto a 3D object. **b)** Conversion of bytes (8 bits) to 2n-bit wide symbols. Thus n is the bit width for the I and Q quantization; e.g., at 64 QAM the symbol width is 2n=6 bit, n=3, i.e., I and Q are subdivided into 23=8 amplitude values each. **c)** Refers to the definition of memory for storing data used by a particular display mode. The range of addresses reserved for graphics information in IBM-compatible systems is from A000:0 to BFFF:F.

Mark – Term used to describe the function of indicating to the editor where the entry or exit of the edit will be done on the fly.

Mark IN – To select the first frame of a clip.

Mark IN/OUT – a) The process of entering the start and end time codes for a clip to be edited into a sequence. **b)** The process of marking or logging timecode numbers to define clips during a logging, recording or digitizing session. See also IN Point, OUT Point.

Mark OUT – To select the last frame of a clip.

Mask – a) A mask image is a black and white image, which defines how opaque each pixel is. A mask blocks out certain components of an image but lets other parts show through. **b)** Pattern used to selectively set certain bits of a word to 1 or 0. Usually ANDed or ORed with the data.

Mask Key – A key that is selectively limited in what portions of the key source will be allowed to cut the hole. Masks are usually square, however, on Ampex switchers mask keys are done by utilizing the pattern system with any pattern shape on the switcher. See Preset Pattern.

Mask Programmed – An IC that is programmed by generating a unique photomask used in the fabrication of the IC.

Masking – Masking is one way of partial compensation for photo-receptor dot sensitivity, non-optimum color filters, non-ideal display phosphors, unwanted dye absorption. Audio: The phenomenon by which loud sounds prevent the ear from hearing softer sounds of similar frequency. The process of blocking out portions of a picture area/signal. A psychoacoustic phenomenon whereby certain sounds cannot be heard in the presence of others. Video: A process to alter color rendition in which the appropriate color signals are used to modify each other. Note: The process is usually accomplished by suitable cross coupling between primary color-signal channels. Photography: Comparable control of color rendition is accomplished by the simultaneous optimization of image dyes, masking dyes, and spectral sensitivities.

Masking Threshold – A measure of a function below which an audio signal cannot be perceived by the human auditory system.

Mass Storage – Secondary, slower memory for large files. Usually floppy disk or magnetic tape.

Master – The final edited tape recording from a session from which copies will be made called sub masters. These may be used for some subsequent editing to create other effects.

Master Clip – In the bin, the media object that refers to the media files recorded or digitized from tape or other sources. See also Clip, Subclip.

Master Guide Table (MGT) – The ATSC PSIP table that identifies the size, type, PID value, and version number for all other PSIP tables in the transport stream.

Master Reference Synchronizing Generator – A synchronizing pulse generator that is the precision reference for an entire teleproduction facility.

Master Shot – The shot that serves as the basic scene, and into which all cutaways and close-ups will be inserted during editing. A master shot is often a wide shot showing all characters and action in the scene.

Master/Slave – a) Software option which allows user to maintain synchronization between two or more transports using one machine as control reference (master). **b)** A video-editing process in which one or more decks (the slaves) are set to imitate the actions of another deck (the master).

Mastering – The process of making a master pressing disc with a laser beam recorder and a metal plating process. This master is then used in the replication process to make thousands of copies. The process is conceptually similar to processes used to create vinyl LPs.

Mastering Lathe – A turntable and cutting head used to cut the disk from which the plates used to press records are made.

Match – Matching individual frames in assembled clips to the corresponding frames in the source clip.

Match Frame – An edit in which the source and record tape pick up exactly where they left off. Often used to extend a previous edit. Also called a Tracking Edit.

Match Frame Edit – An edit in which the last frame of the outgoing clip is in sync with the first frame of the incoming clip, such that the incoming clip is an extension of the outgoing clip.

Matchback – The process allowing you to generate a film cut list from a 30-fps video project that uses film as the source material.

Matchback Conversion – The conversion from film to video frame rates.

Matched Dissolve – A dissolve where the main object is matched in each camera.

Matched Resolution – A term sometimes used to describe matching the resolution of a television system to the picture size and viewing distance (visual acuity); more often a term used to describe the matching or horizontal and vertical (and sometimes diagonal) resolutions. There is some evidence that the lowest resolution in a system (e.g., vertical resolution) can restrict the perception of higher resolutions in other directions. See also Square Pixels.

Match-Frame Edit – Edit in which a scene already recorded on the master is continued with no apparent interruption. A match-frame edit is done by setting the record and source in-points equal to their respective out-points for the scene that is to be extended.

Material Editing – Each material has a number of attributes such as transparency, ambient, diffusion, refraction, reflection, and so on.

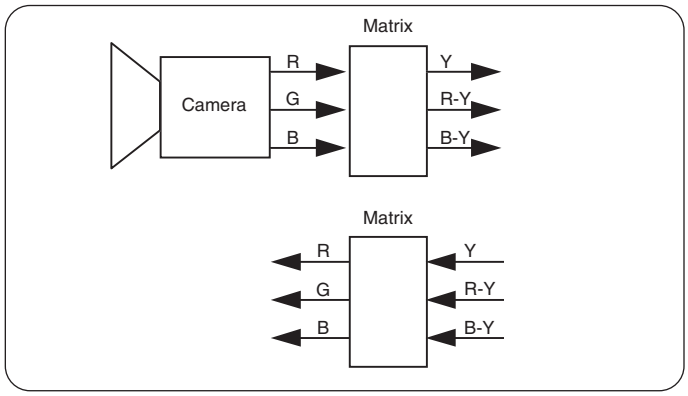
Mathematically Lossless Compression – A method of compressing video without losing image quality. The video is identical to uncompressed video, but requires less disk space.

Mathias, Harry – Cinematographer, designer, teacher, consultant, and author who came up with the six priorities of electronic cinematography.

Harry Mathias' Priorities for Electronic Cinematography
(in order of importance)

(1) Practicality, Flexibility, Ruggedness
(2) Aspect Ratio
(3) Sensitivity
(4) Gamma or Transfer Characteristic
(5) Resolution
(6) Standards Acceptance (or Standards Conversion)

Matrix – a) Device that converts the RGB components from the camera into color difference signals and the reverse. **b)** A set of crosspoints in a particular functional area of a switcher corresponding to a bus (the controls for that matrix). See Audio Matrix and Primary Matrix.



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

Matrix Switcher – A device which uses an array of electronic switches to route a number of audio/video signals to one or more outputs in almost any combination. Production quality matrix switchers perform vertical interval switching for interference free switching. Matrix switchers may be operated with RS-232 or RS-422 controls, enhancing flexibility.

Matrix Wipe – a) A wipe wherein the screen is divided into square areas, each of which can contain the video from either bus. Initially, each square contains the first bus video, and as the wipe develops, one or more squares switch to the opposite bus video until, at the completion of the wipe, all squares contain the second bus video. **b)** A type of wipe comprised of multiple boxes (a matrix of boxes) which turn on various parts of the "B" video during the course of a transition from the "A" video, until all the boxes have turned on the scene is all "B" video. This operates in either direction.

Matrixing – To perform a color coordinate transformation by computation or by electrical, optical, or other means.

Matsushita – Parent of Panasonic and Quasar, majority owner of JVC, first company to demonstrate an HD camera and display in the U.S., has continued demonstrations, and developed the QUME and QAM ATV schemes, which popularized the idea of quadrature modulation of the picture carrier.

Matte – An operational image or signal carrying only transparency information and intended to overlay and/or control a conventional image or image signal. **a)** Without shine or gloss. Relatively unreflective of light. Removal of a portion of a TV picture and replacement of it with another picture. **b)** A solid color, adjustable in hue, luminance, and saturation. Matte is used to fill areas of keys and borders. Ampex switchers generate many internal matte signal keys. **c)** A film term used to describe the film effect analogous to a key. Sometimes this definition is carried over into video and used to describe a video key. **d)** A black and white high contrast image that suppresses or cuts a hole in the background picture to allow the picture the matte was made from to seamlessly fit in the hole.

Matte Channel – See Alpha Channel.

Matte Edge – An undesirable, unwanted outline around a matted image. This is also called Matte Ring, Matte Ride, but more generally called a "bad matte".

Matte Fill – A key filled with a solid color instead of "self", which is the video cutting the key. This color is internally generated and adjustable in hue, luminance and saturation.

Matte Generator – The circuitry which generates the matte.

Matte In – To add.

Matte Key – A key effect in which the inserted video is created by a matte generator. It is composed of three components: the background video, the foreground video, and the matte or alpha channel (black and white or grayscale silhouette) that allows one portion of the image to be superimposed on the other.

Matte Out – To remove, eliminate.

Matte Reel – A black and white (hi con) recording on tape used as a key source for special effects.

MATV (Master Antenna TV) – A mini cable system relaying the broadcast channels usually to a block of flats or a small housing estate.

Maximum Intrinsic Flux – In a uniformly magnetized sample of magnetic material, the product of the maximum intrinsic flux density and the cross-sectional area.

Maximum Intrinsic Flux Density – The maximum value, positive or negative, of the intrinsic flux density in a sample of magnetic material which is in a symmetrically, cyclically magnetized condition.

Maxwell – A unit of magnetic flux.

MB (Megabyte) – A standard unit for measuring the information storage capacity of disks and memory (RAM and ROM); 1000 kilobytes make one megabyte.

Mbit – 1,000,000 bits.

MBONE (Multicast Backbone) – a) The MBONE is a system of transmitting audio and video over a multicast network. Mostly available at universities and government facilities, the MBONE can be thought of as a testbed for technologies that will eventually be promulgates across the larger Internet. The MBONE has been replaced on the vNBS and Abilene by native multicast support. **b)** A collection of Internet routers that support IP multicasting. The MBONE is used as a multicast channel that sends various public and private audio and video programs.

Mbps or Mb/s (Megabits Per Second) – A data transmission rate in millions of binary digits per second.

MBps or MB/s (Megabytes Per Second) – Data rate in millions of bytes per second.

MCA (Media Control Architecture) – System-level specification developed by Apple Computer for addressing various media devices (videodisc/videotape players, CD players, etc.) to its Macintosh computers.

MCI (Media Control Interface) – a) Microsoft's interface for controlling multimedia devices such as a CD-ROM player or a video playback application. **b)** A high-level control interface to multimedia devices and resource

files that provides software applications with device-independent control of audio and video peripherals. MCI provides a standard command for playing and recording multimedia devices and resource files. MCI is a platform-independent layer between multimedia applications and system lower-level software. The MCI command set is extensible inasmuch as it can be incorporated in new systems via drivers and can support special features of multimedia systems or file formats. MCI includes commands like open, play, and close.

MCPC (Multiple Channels Per Carrier) – An average satellite transponder has a bandwidth of 27 MHz. Typically, the highest symbol rate that can be used in SR 26 MS/s, and multiple video or audio channels can be transmitted simultaneously. MCPC uses a technique called Time Division Multiplex to transmit multiple programs, which works by sending data for one channel at a certain time and then data for another channel at another time. Many encoder manufacturers are currently experimenting with statistical multiplexing of MPEG-2 data. Using this technique, channels that need high data rate bursts in order to prevent pixelization of the picture, such as live sports events will obtain the bandwidth as they need it by reducing the data rate for other services that do not. Statistical multiplexing should improve perceived picture quality, especially on video that changes rapidly. It also has the advantage of requiring no changes in the receiver equipment.

MCU – See Multipoint Control Unit.

MDCT (Modified DCT) – Used in Layer 3 audio coding.

MDS (Multipoint Distribution Service) – A one-way domestic public radio service rendered on microwave frequencies from a fixed station transmitting (usually in an omnidirectional pattern) to multiple receiving facilities located at fixed points.

MedFER – One who experiments with radio communications at low frequencies such as those on the edges of the AM broadcast band (under FCC Part 15).

Media – The video, audio, graphics, and rendered effects that can be combined to form a sequence or presentation.

Media 100 – A nonlinear editing system that uses its own proprietary software. Often used with Adobe After Effects.

Media Clip – A video segment usually interleaved with an audio segment.

Media Data – Data from a media source. Media data can be: Analog Data: Film frames, Nagra tape audio, or videotape video and audio. Digital Data: Either data that was recorded or digitized such as video frame data and audio samples, or data created in digital form such as title graphics, DAT recordings, or animation frames.

Media Files – Files containing the compressed digital audio and video data needed to play Avid clips and sequences.

Media Conversion – The process of converting data from one type of media to another for premastering and mastering. Premastering software typically requires input data on hard disk.

Media Object – A representation of a natural or synthetic object that can be manifested aurally and/or visually. Each object is associated with zero or more elementary streams using one or more object descriptors.

Media Object Decoder – An entity that translates between the coded representation of an elementary stream and its decoded representation.

Media Sample Data – See Safe Color Limiting.

Median Filter – An averaging technique used by PCEC in its IDTV line interpolation scheme to take an average of lines in the current and previous fields to optimize resolution and avoid motion artifacts without using motion compensation.

Medium – The substance through which a wave is transmitted.

Medium Scale Integration (MSI) – Technology by which a dozen or more gate functions are included on one chip.

Medium Shot – Camera perspective between long shot and closeup, whereby subjects are viewed from medium distance.

Mega – One million, i.e., megacycle is one million cycles.

Megabyte (Mbyte) – One million bytes (actually 1,048,576); one thousand kilobytes.

Megaframe Initialization Packet (MIP) – A transport stream packet used by DVB-T to synchronize the transmitters in a multi-frequency network.

Megahertz (MHz) – One million hertz (unit of frequency). A normal U.S. television transmission channel is 6 MHz. The base bandwidth of the video signal in that channel is 4.2 MHz. The SMPTE HDEP system calls for 30 MHz each for red, green, and blue channels.

Memory – Part of a computer system into which information can be inserted and held for future use. Storage and memory are interchangeable terms. Digital memories accept and hold binary numbers only. Common memory types are core, disk, tape, and semiconductors (which includes ROM and RAM).

Memory Counter (or Rewind) – A system which allows the tape to be rewound automatically to any predetermined point on the tape.

Memory Effect – Loss of power storing capability in NiCad (video camera) batteries which occurs when batteries are habitually discharged only partially before recharging. To avoid the memory effect, always fully discharge NiCad batteries before recharging.

Memory Map – Shows the address assignments for each device in the system.

Memory-Mapped I/O – I/O devices that are accessed by using the same group of instruction and control signals used for the memory devices in a system. The memory and I/O devices share the same address space.

Menu – a) A list of operations or commands that the IRIS can carry out on various objects on the screen. **b)** A group of parameters and flags that enable manipulation of the video image. Menus are Target, Rotate, Border, Source (with Sides submenu), Digimatte, Timeline and KF Flags. **c)** A graphic image, either still or moving, with or without audio provided to offer the user a variety of choices within the confines of the authoring and product material provided. It is the traditional meaning of a menu like you might find in a restaurant.

MER (Modulation Error Ratio) – The MER is defined as the ratio of I/Q signal power to I/Q noise power; the result is indicated in dB.

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

MESECAM – Middle East SECAM or (B, G, D, K) SECAM. 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) A graphical construct consisting of connected surface elements to describe the geometry/shape of a visual object. **b)** A grid that is placed over an image during morphing or warping.

Meshbeat – See Moiré.

Metadata – a) The descriptive and supporting data that is connected to the program or the program elements. It is intended to both aid the direct use of program content and support the retrieval of content as needed during the post-production process. **b)** Generally referred to as "data about data" or "data describing other data". More specifically, information that is considered ancillary to or otherwise directly complementary to the essence. Any information that a content provider considers useful or of value when associated with the essence being provided.

Metadata Dictionary – The standard database of approved, registered data element tags, their definitions and their allowed formats.

Metal Particle – One of the most recent developments of a magnetizable particle for magnetic tape, products from pure iron and having very high coercivity in the range of 850 to 1250 oersteds.

Metamorphosis – Given two databases with the same number of vertices, a metamorphosis causes the first to become the second. This is an animation tool.

Method – Methods, in the object-oriented terminology, are executable procedures associated with an object that operates on information in the object's data structure.

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 with the studio, 270 Mbps 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. DS-3 at 44.736 will be used in both terrestrial and satellite program distribution.

MFN (Multifrequency Network)

MFP (Mega Frame Packet)

MGT – See Master Guide Table.

MHEG – See Multimedia Hypermedia Expert Group.

MHP (Multimedia Home Platform) – A set of common application programming interfaces (API) designed to create an operating system independent, level playing field for broadcasters and consumer-electronics manufacturers. The goal is to provide all DVB-based terminals (set-tops, TVs, and multimedia PCs) full access to programs and services built on the DVB Java (DVB-J) platform.

MHz – See Megahertz.

MIB (Management Information Base) – The Management Information Base is a collection of managed objects defined by their attributes and visible to the network management system.

MIC (MPEG-2 Interface Card)

Micro – One millionth.

Micro Channel – Personal computer bus architecture introduced by IBM in some of its PS/2 series microcomputers. Incompatible with original PC/AT (ISA) architecture.

Micro-Cassette – A miniature cassette system originated by Olympus, allowing 30 minutes of recording per side on a capstan-driven tape, 1/7" wide, running at 15/16 ips.

Microcode – See Microprogram.

Microcomputer – Complete system, including CPU, memory and I/O interfaces.

Microdropouts – Low level, short duration dropouts. They correspond to RF envelope dropouts of 10 dB or greater with a duration of 0.5 to 0.8 microseconds.

Microphone – A transducer which converts sound pressure waves into electrical signals.

Microphone Impedance – In order to obtain the highest quality output signal from a microphone, a preamplifier input should provide a load (impedance) which exactly matches a microphone's output impedance. Microphone output impedances vary from 150 ohms to several megohms.

Microphone Preamplifier – A microphone is a transducer which converts sound waves to electrical impulses. Microphones typically generate very low signal levels requiring low noise, high fidelity, pre-amplification to boost the output signal to a level compatible with audio amplifier circuitry. Good microphone preamplifiers provide precise matching of microphone impedance and low noise electronic components.

Microphonics – In video transmission, refers to the mechanical vibration of the elements of an electron tube resulting in a spurious modulation of the normal signal. This usually results in erratically spaced horizontal bars in the picture.

Microprocessor – Central processing unit fabricated on one or two chips. The processor consists of the arithmetic and logic unit, control block, and registers.

Microprogram – Program that defines the instruction set. The microprogram (also called microcode) tells the CPU what to do to execute each machine language instruction. It is even more detailed than machine language and is not generally accessible to the user.

Microsecond – One millionth of a second: 1 x 10-6 or 0.000001 second. A term used to mean very fast/instantaneous.

Microwave – One definition refers to the portion of the electromagnetic spectrum that ranges between 300 MHz and 3000 GHz. The other definition is when referring to the transmission media where microwave links are used. Frequencies in microwave transmission are usually between 1 GHz and 12 GHz.

Microwave Dish – A parabolic shaped antenna used for high frequency RF signals.

Microwave Transmission – Communication systems using high frequency RF to carry the signal information.

Microwaves – Radio frequencies with very short wavelengths (UHF).

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

MIDI (Musical Instrument Digital Interface) – A standard for connecting electronic musical instruments and computers. MIDI files can be thought of as digital sheet music, where the computer acts as the musician playing back the file. MIDI files are much smaller than digital audio files, but the quality of playback will vary from computer to computer.

MIDI Timecode – A system for timed device control through MIDI protocols. The importance of MIDI timecode in video post-production has increased due to the increased use of personal computers for video production.

Midtones – Mid-level grays in an image.

MII – Portable, professional video component camera/recorder format, utilizing 1/2" metal particle videotape.

MII (M2) – Second generation camera/recorder system developed by Panasonic. Also used for just the recorder or the interconnect format. MII uses a version of the (Y, R-Y, B-Y) component set.

MII Format – A component videotape format created by Panasonic in an effort to compete with Sony Betacam. MII is an extension of the VHS consumer format as Sony Betacam is an extension of the Betamax home video technology.

Mike – Microphone.

Mike Boom – A rigid extension to which a microphone may be attached.

Mike Pad – An attenuator placed between the output of a mike and the input of a mike preamp to prevent overdriving the preamp.

Mil – 0.001 of an inch.

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

Miller Squared Coding (M2) – A DC-free channel coding scheme used in D2 VTRs.

Millimeter – One thousandth of a meter.

Millimicron – One billionth of a meter.

Millisecond – One thousandth of a second.

MIME (Multi-Purpose Internet Mail Extensions) – Standard for transmitting non-text data (or data that cannot be represented in plain ASCII code) in Internet mail, such as binary, foreign language text (such as Russian or Chinese), audio, or video data. MIME is defined in RFC2045.

Mini-Cassette – A miniature cassette system originated by Philips, allowing 15 minutes of recording per side on a narrow tape.

Minimize – To reduce a window to an icon for later use.

Minimum Performance – The line between EDTV and HDTV. Naturally, each ATV proponent defines minimum performance so as to favor its system to the detriment of others.

MIP – See Megaframe Initialization Packet.

MIPS (Millions of Instructions Per Second) – Refers to a computer processor's performance.

Miro Instant Video – An edit mode in Adobe Premiere for Windows, specifically for DC30 users, that allows video to be streamed out of a DC30 capture card.

Mistracking – The phenomenon that occurs when the path followed by the read head of the recorder does not correspond to the location of the recorded track on the magnetic tape. Mistracking can occur in both longitudinal and helical scan recording systems. The read head must capture a given percentage of the track in order to produce a playback signal. If the head is too far off the track, record information will not be played back.

MIT (Massachusetts Institute of Technology) – Home of the Media Lab and its Advanced Television Research Program (ATRP), its Audience Research Facility, its Movies of the Future program, and other advanced imaging and entertainment technology research. In addition to conducting and publishing a great deal of ATV research, MIT has come up with two ATV proposals of its own, one called the Bandwidth Efficient Proposal and one the Receiver Compatible Proposal.

MITG (Media Integration of Text and Graphics)

Mix – a) A transition between two video signals in which one signal is faded down as the other is faded up. Also called a dissolve or cross fade. **b)** This term is most often used as a synonym for additive mix but may also refer to a non-additive mix.

Mix Effects (M/E) – One of the console modules (or its associated signal processing boards) which allows an operator to perform wipes, mixes, keys, etc.

Mixdown Audio – The process that allows the user to combine several tracks of audio onto a single track.

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

Mixer – The audio or video control equipment used for mixing sound and/or video. In video, a device for combining several video input signals.

Mixing – To combine various pictures and/or audio elements together.

Mixing Console – A device which can combine several signals into one or more composite signals, in any desired proportion.

Mixing, Digital – A step in post-production during which two or more digital representations are combined to create an edited composition. In a transmission, recording, or reproducing system, combining two or more inputs into a common output, which operates to combine linearly the separate input signals in a desired proportion in an output signal. Production: Generally the editing of digital image data, resulting in composites ranging from simple transitions to multilayered collages combining selected information from many interim images. The combining of digital images is accomplished by suitable arithmetic calculations on related pairs of

digital words. Data Processing: A process of intermingling of data traffic flowing between concentration and expansion stages.

MJD (Modified Julian Date) – A day numbering system derived from the julian date. It was introduced to set the beginning of days at 0 hours, instead of 12 hours and to reduce the number of digits in day numbering. The modified julian date is obtained subtracting 2.400.000,5 from the julian date. As a consequence, the origin of this date (day zero) begin at 1858 November 17 at 0 hours. For example, 1996 January 1 at 0 hours began the modified julian day 50,083.

MJPEG – See Motion JPEG.

MMCD (Multimedia CD) – A development proposal from Sony and Philips, now integrated in the DVD.

MMDS (Multi-Point Microwave Distribution System) – This is a terrestrial broadcasting technology which utilizes low-power microwave transmitters, and is mainly used for extending the range of cable TV systems and for TV distribution in sparsely populated areas or in areas with rough terrain. MMDS is not specifically analog or digital. In digital MMDS, the use of MPEG is highly attractive to boost the number of channels that may be distributed.

MMI (Man Machine Interface) – Refers to the interface presented by a machine to a human operator. Another name for User Interface.

MMT (Modulation Mode Table)

Mnemonic Code – Codes designed to assist the human memory. The microprocessor language consists of binary words, which are a series of 0s and 1s, making it difficult for the programmer to remember the instructions corresponding to a given operation. To assist the human memory, the binary numbered codes are assigned groups of letters (of mnemonic symbols) that suggest the definition of the instruction. For example, the 8085 code 100000 binary means load accumulator and is represented by the mnemonic LDA.

Mobile Unit – Equipment designed to be movable as a unit. A truck/van with all the necessary equipment to do photography/production on location. Sometimes mobile units have cameras and VTRs within them and sometimes they are added for specific jobs.

Mod – Abbreviation for Modulator on the 4100 series and Modifier on the AVC series.

MOD (Minimum Object Distance) – Feature of a fixed or a zoom lens that indicates the closest distance an object can be from the lens's image plane, expressed in meters. Zoom lenses have MOD of around 1 m, while fixed lenses usually much less, depending on the focal length.

Model-Based Coder – Communicating a higher-level model of the image than pixels is an active area of research. The idea is to have the transmitter and receiver agree on the basic model for the image; the transmitter then sends parameters to manipulate this model in lieu of picture elements themselves. Model-based decoders are similar to computer graphics rendering programs. The model-based coder trades generality for extreme efficiency in its restricted domain. Better rendering and extending of the domain are research themes.

Modeling – a) The process of creating a 3D world. There are several kinds of 3D modeling, including: boundary representation, parametric (or analytic), and constructive solid geometry. After the geometry of a model is determined, its surface properties can be defined. **b)** This process involves describing the geometry of objects using a 3D design program.

Modem (Modulator/Demodulator) – An electronic device for converting between serial data (typically RS-232) from a computer and an audio signal suitable for transmission over telephone lines. The audio signal is usually composed of silence (no data) or one of two frequencies representing 0 and 1. Modems are distinguished primarily by the baud rates they support which can range from 75 baud up to 56000 and beyond. Various data compression and error algorithms are required to support the highest speeds. Other optional features are auto-dial (auto-call) and auto-answer which allow the computer to initiate and accept calls without human intervention.

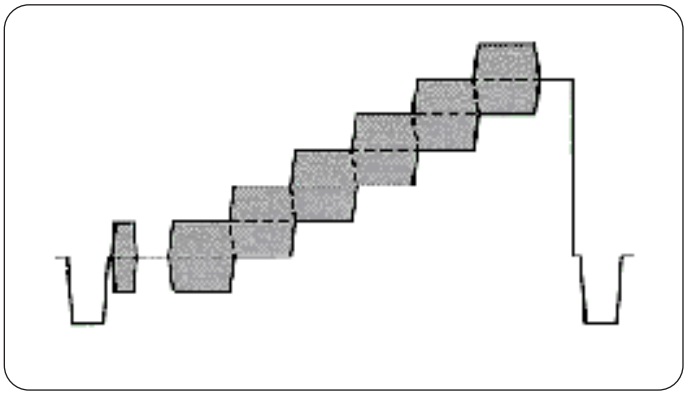
Modifier – Pattern system electronics capable of modulator effects, continuous rotation effects, pattern border hue modulation, pattern border rainbows, and position modulation.

Modulate – To impress information on an AC or RF signal by varying the signals amplitude, frequency or phase.

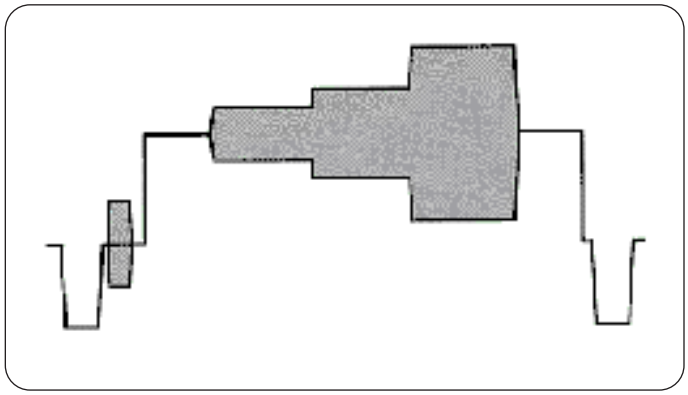
Modulated – When referring to television test signals, this term implies that chrominance, luminance, sync, color burst and perhaps audio information is present.

Modulated Carrier Recording – Signal information recorded in the form of a modulated carrier.

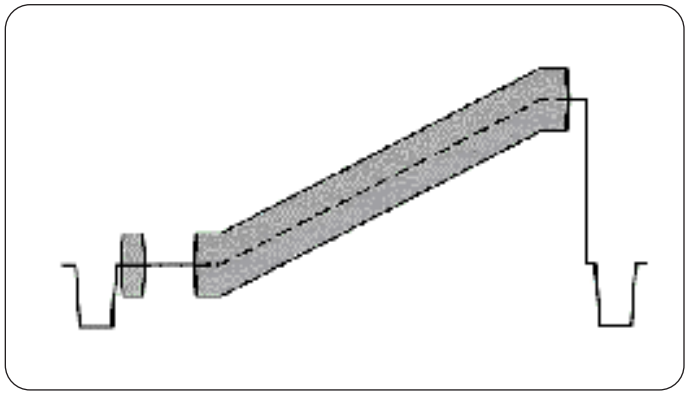
Modulated Five-Step Test Signal – A test signal with five steps of luminance change, each step having a constant frequency and phase chrominance signal. This signal is used to test for differential phase distortions. There is also a 10-step version of this signal.



Modulated Pedestal – A test signal which consists of three chrominance packets with the same phase, on the same luminance level (50 IRE), with different amplitudes (20, 40 and 80 IRE). This signal is used to test for chrominance nonlinear phase distortion and chrominance to luminance intermodulation distortion.



Modulated Ramp Test Signal – A test signal with a linear rise in luminance and constant chrominance as shown in the figure to the right. This signal is used to test for differential phase distortions.



Modulation – a) The imposing of a signal on some type of transmission or storage medium, such as a radio carrier or magnetic tape. **b)** The process (or result) of changing information (audio, video, data, etc.) into information-carrying signals suitable for transmission and/or recording. In NTSC-M television transmission, video is modulated onto a picture carrier using amplitude modulation-virtual sideband, and audio is modulated onto a sound carrier using frequency modulation.

Modulation Noise – a) Noise which results from the agitation of the oxide molecules through the recording process. The modulation noise level increases as record level increases and disappears when no signal is present. **b)** The noise arising when reproducing a tape which has been recorded with a given signal, and which is a function of the instantaneous amplitude of the signal. This is related to DC noise and arises from the same causes.

Modulator – a) A section within a VTR that changes the frequency of the video signal information coming in from an external source (i.e., an electronic camera) to signal information that is compatible with the requirements of the VTR heads, while keeping the picture information basically unchanged. **b)** Pattern system electronics capable of distorting the edge of a pattern by impressing a sine or other waveform on the vertical or horizontal shape of the pattern. **c)** The device that places information on an RF carrier signal.

Modulator Lock – A feature that synchronizes the modulator or modifier effect to the frame rate, thus preventing the effect from drifting or appearing incoherent.

Module – A small device, not working by itself, designed to perform specialized tasks in association with a host, for example: a conditional access subsystem, an electronic program guide application module, or to provide resources required by an application but not provided directly by the host.

Module Board – Printed circuit board and mounted components that is attached to the base board using screws and spacers.

Moiré – a) An image artifact that occurs when a pattern is created on the screen where there should not be one. The moiré pattern is generated when different frequencies that are part of the video signal, create a new unwanted frequency. **b)** A wavy pattern, usually caused by interference. When that interference is cross-color, the pattern is colored, even if the picture is not. **c)** The spurious pattern in the reproduced television picture resulting from interference beats between two sets of periodic structures in the image. It usually appears as a curving of the lines in the horizontal wedges of the test pattern and is most pronounced near the center where the lines forming the wedges converge. A Moiré pattern is a natural optical effect when converging lines in the picture are nearly parallel to the scanning lines.

MOL (Maximum Output Level) – In audio tape, that record level which produces a 3rd harmonic distortion component at 3.0%.

Mole Technology – A seamless MPEG-2 concatenation technology developed by the ATLANTIC project in which an MPEG-2 bitstream 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. If an opaque bug is inserted in the picture, the encoder only has to decide how the bug should be encoded (and then both the bug and the video have been theoretically encoded only once). Problems arise with transparent or translucent bugs, because the video underneath the bug must be encoded, and therefore that video will have to be encoded twice, while the surrounding video and the bug itself have only been encoded once theoretically. What Mole cannot do is make the encoding any better. Therefore, the highest quality of initial encoding is suggested.

Moment of Inertia – A measure of the rotational force required to accelerate or decelerate a reel of tape or other rotating object.

Monitor – a) A TV set, or a TV set specifically designed for closed circuit viewing (i.e., from a VTR) without the electronic capability to receive broadcast signals. **b)** A hardware device that displays the images, windows, and text with which you interact to use the system. It is also called a video display terminal (VDT). **c)** Program that controls the operation of a microcomputer system and allows user to run programs, examine and modify memory, etc.

Monitor Head – A separate playback head on some tape recorders that makes it possible to listen to the material on the tape an instant after it has been recorded and while the recording is still in progress.

Monitor Outputs – A set of outputs from a switcher or video recorder for the specific purpose of feeding video monitors (although not limited to that purpose). These include preview, individual M/Es, DSK, and bus rows. The AVC also provides monitor outputs for RGB signals, aux bus selections, and switcher status information.

Monitor Power Cable – The cable that connects the monitor to the workstation to provide power to the monitor. It has a male connector on one end and a female connector on the other.

Monitor Standardization – Although it is customary to make all subjective judgments of image quality from the reference monitor display, the infinite possibilities for monitor adjustments have hampered reviewers in exercising effective program control, and have introduced many disparities and great confusion. The SMPTE Working Group on Studio Monitors, S17.28, is completing work on three specifications intended to make the monitor display follow a known electro-optic transfer function and permit a reliable evaluation of the program image quality.

Monitor Video Cable – The cable that connects the monitor to the workstation to transmit video signals. It has large connector on both ends.

Monitor, Control – A control monitor is one employed primarily for decisions on subject matter, composition, and sequences to be selected in real-time. It is frequently one of several monitors mounted together in close proximity as in a studio – for example, to display multiple sources that are to be compared, selected, and combined in editing for immediate, direct routing to display. The physical arrangements may make it very difficult to control the surroundings for each monitor, as specified by SMPTE Working Group on Studio Monitors in Document S17.280 for the reference monitor. It is nevertheless essential when sequences on several monitors are being compared and intercut that the monitors match in luminance and colorimetry.

Monitor, Reference – A reference monitor is one employed for decisions on image quality. Achieving controlled reproducibility for this application is the primary objective of the specifications for monitor standardization. SMPTE Working Group on Studio Monitors, S17.28, has recognized the great disparity now existing among studio monitors and control monitors, and has noted the confusing variability among decisions based upon visual judgments of program quality as evaluated on different monitors. They are working to identify and recommend specifications for the variables affecting subjective judgments, coming not only from the monitor capabilities, but also from the adjustment of its controls and the bias introduced by monitor surround and room illumination.

Monitor, Standardization – Although it is customary to make all subjective judgments of image quality from the reference monitor display, the infinite possibilities for monitor adjustments have hampered reviewers in exercising effective program control, and have introduced many disparities and great confusion. The SMPTE Working Group on Studio Monitors, S17.27, is completing work on three specifications intended to make the monitor display follow a known transfer function, electro-optic, and permit a reliable evaluation of the program image quality.

Mono, Monophonic – Single-channel sound.

Monochrome – Literally single color, usually used to indicate black and white. There have been monochrome high line rate cameras and displays for many years. The EIA has standardized rates of up to 1225 scanning lines per frame. NHK developed a monochrome HDTV system with 2125 scanning lines per frame. Even higher number of scanning lines are used in conjunction with lower frame rates in cathode ray tube scanners used in printing and in film. These extremely high rates are possible because monochrome picture tubes have no triads.

Monochrome Signal – A "single color" video signal – usually a black and white signal but sometimes the luminance portion of a composite or component color signal.

Monochrome Transmission (Black and White) – The transmission of a signal wave which represents the brightness values in the picture but not the color (chrominance) values in the picture.

Monophonic – One sound channel/source/signal. Sometimes called monaural.

Monotonic – A term used in D/A conversion and is used to indicate that the magnitude of the DAC output voltage increases every time the input code increases.

MooV – The file format used in the QuickTime and QuickTime for Windows environments for displaying videos. See QuickTime, QuickTime for Windows.

MOPS (Millions of Operations Per Second) – In the case of DVI technology, more MOPS translate to better video quality. Intel's video processor can perform multiple video operations per instruction, thus the MOPS rating is usually greater than the MIPS rating.

Morphing – A technique for making an object change into the shape of another.

MOS (Metal Oxide Semiconductor) – Integrated circuits made of field effect transistors. All MOS devices originally used metal gate technology, but the term is used to describe silicon gate circuits as well.

Mosaic – a) Term used for an ADO effect which is to segmentize a video signal into rectangles of variable block sizes and aspect ratio. **b)** An effect that "blurs" an image by copying pixels into adjacent pixels both horizontally and vertically. This gives the image a blocky appearance, often used to hide people's identities on television.

Mosquito Noise – Caused by quantizing errors between adjacent pixels, as a result of compression. As the scene content varies, quantizing step sizes change, and the quantizing errors produced manifest themselves as shimmering black dots, which look like "mosquitoes" and show at random around objects within a scene.

Most Significant Bit (MSB) – The bit that has the most value in a binary number or data byte. In written form, this would be the bit on the left. For example,

Binary 1110 = Decimal 14

In this example, the leftmost binary digit, 1, is the most significant bit, here representing 8. If the MSB in this example were corrupt, the decimal would not be 14 but 6.

Mother – The metal disc produced from mirror images of the Father disc in the replication process. Mothers are used to make stampers, often called Sons.

Motherboard – See Backplane.

Motion Adaptive – An ATV scheme that senses motion and changes the way it functions to avoid or reduce motion artifacts.

Motion Artifacts – a) Picture defects that appear only when there is motion in the scene. Interlaced scanning has motion artifacts in both the vertical and horizontal directions. There is a halving of vertical resolution at certain rates of vertical motion (when the detail in one field appears in the position of the next field one sixtieth of a second later), and horizontally moving vertical edges become segmented (reduced in resolution) by the sequential fields. This is most apparent when a frame of a motion sequence is frozen and the two fields flash different information. All subsampling ATV schemes have some form of motion artifact, from twinkling detail to dramatic differences between static and dynamic resolutions. Line doubling schemes and advanced encoders and decoders can have motion artifacts, depending on how they are implemented. Techniques for avoiding motion artifacts include median filtering and motion adaptation or compensation. **b)** In all temporally-sampled systems (i.e., both photographic and electronic), realistic motion reproduction is achieved only with sampling above the Nyquist limit. The subjective response to motion artifacts is complex, influences by the various degrees of smoothing and strobing affecting temporal and spatial resolution, integration and tag in the sensing, recording, and display elements; sampling geometry and scanning patterns; shutter transmission ratio; perceptual tolerances, etc. (Motion appears "normal" only when significant frame-to-frame displacement occurs at less than half the frame rate; i.e., "significant motion" distributed over at least two frames.) Motion artifacts most frequently observed have their origins in the following: image components with velocity functions extending beyond the Nyquist limit (such as rotating, spoked wheels), motion samples with such short exposures there is noticeable frame-to-frame separation of sharply defined images (such as synchronized flash illumination), asynchronous sampling of intermittent motion (such as frame-rate conversions). A considerable number of motion artifacts appear so frequently as to be accepted by most viewers.

Motion Compensation (MC) – In MPEG, the use of motion vectors to improve the efficiency of the prediction of pel values. The prediction uses motion vectors to provide offsets into the past and/or future reference pictures containing previously decoded pel values that are used to form the prediction error signal. The book Motion Analysis for Image Sequence Coding by G. Tziritas and C. Labit documents the technical advances made through the years in dealing with motion in image sequences.

Motion Effect – An effect that speeds up or slows down the presentation of media in a track.

Motion Estimation (ME) – The process of determining changes in video object positions from one video frame to the next. Object position determination is used extensively in high compression applications. For instance if the background of a scene does not change but the position of an object in the foreground does, it is advantageous to just transmit the new position of the object rather than the background or foreground. This technology is used in MPEG, H.261, and H.263 compression.

Motion Jitters – Jerky movements in a clip, often caused by gate slip when film is converted into video.

Motion JPEG – Applications where JPEG compression or decompression is speeded up to be able to process 25 or 30 frames per second and is applied real-time to video. Even though a video signal is being processed, each field is still individually processed.

Motion Path – The movement between keyframes, changed with the Path soft key. There are five types of paths. BRK (Break) modifies Smooth motion by decelerating speed to zero at each keyframe (a break), then starting again. IGN (Ignore) allows selected parameter values to be ignored when calculating motion path. SMTH (Smooth) provides a curved path between keyframes. The effect speeds up gradually as it leaves the first keyframe, and slows down gradually until it reached the last keyframe. LIN (Linear) provides a constant rate of change between keyframes, with an abrupt change at each keyframe. Linear uses the shortest distance between two points to travel from one keyframe to another. HOLD stops all motion between keyframes. The result of the motion shows when the next keyframe appears. HOLD looks like a video "cut", from one keyframe to the next.

Motion Path Velocity – A successful motion path has two components: geometry and timing. The geometry is created by choosing keyframes. The timing of the path is more complex, and can be affected by the geometry. Intuitively, the timing of a path is simply the speed of motion of the object as it moves along the path. Since PictureMaker starts with keyframes and creates in-between positions, PictureMaker determines the velocity by deciding how many in-betweens to place between each keyframe (and where to place them). Several methods can be used to determine velocity along the path. **a)** Place frame evenly between all keyframes. Closely placed keyframes will correspond with slow moving parts of the path. **b)** Specify a relative velocity at selected keyframes, and specify correspondences between any keyframe and a frame in the final animation.

Motion Prediction – The process that reduces redundancy in a video signal by measuring an object's motion at the encoder and sending a motion vector to the decoder in place of the encoded object.

Motion Resolution – See Dynamic Resolution.

Motion Stabilization – A feature used to eliminate the wobble in the video taken with a hand-held camera. The After Effects Production Bundle includes a motion stabilizer.

Motion Surprise – A major shift in the quality of a television picture in the presence of motion that is so jarring to the viewer that the system might actually appear better if it had continuously lower quality, rather than jumping from high-quality static image to a lower quality dynamic one.

Motion Tracking – The process of generating position information that describes motion in a clip, for example, the changing position of a moving vehicle. You use motion tracking data to control the movement of effects. See also Stabilization.

Motion Vector (MV) – a) A two-dimensional vector used for motion compensation that provides an offset from the coordinate position in the current picture to the coordinates in a reference picture. **b)** A pair of numbers which represent the vertical and horizontal displacement of a region of a reference picture for production.

Motion Vector for Shape – A motion vector used for motion compensation of shape.

Motion Video – Video that displays real motion by displaying a sequence of images (frames) rapidly enough that the eyes see the image as a continuously moving picture.

Moto DV Playback – An edit mode in Premiere, specifically for Moto DV studio users, that allows video to be streamed out of a Moto DV captured card.

Mount – To make a file system that is stored on a local or remote disk resource accessible from a specific directory on a workstation.

Mount Point – The directory on a workstation from which you access information that is stored on a local or remote disk resource.

Mouse – A hardware device that you use to communicate with windows and icons. You move the mouse to move the cursor on the screen, and you press its buttons to initiate operations.

Mouse Pad – For an optical mouse, this is the rectangular, metallic surface that reads the movements of the mouse. For a mechanical mouse, this is a clean, soft rectangular surface that makes the mouse's track ball roll efficiently.

MOV – The file extension used by MooV format files on Windows. See MooV.

Movie-2 Bus (or Movie-2 Bus Connector) – Over the top connector used for high-speed data transfer. These two terms refer to the assembled component, which consists of a printed circuit board (backplane) with attached connectors.

Moving Dots – See Chroma Crawl.

Moving Picture Experts Group (MPEG) – An international group of industry ex-perts set up to standardize compressed moving pictures and audio. The first release of the MPEG standard was called MPEG-1 (ISO/IEC 11172-1).

Moving Picture Experts Group 1 (MPEG-1) – ISO/IEC CD 11172 is the first of the standards designed for handling highly compressed moving images in real-time. It accepts periodically chosen frames to be compressed as in JPEG-1, predicts the content of intervening frames, and encodes only the difference between the actual and the prediction. Audio is compressed synchronously. The encoder includes a decoder section in order to generate and verify the predictions. At the display, a much simpler decoder becomes possible. MPEG-1 is optimized for a data rate of up to 1.5 Mbps. MPEG expects to develop a series of compression codes, optimized for higher bit rates.

Moving Picture Experts Group 2 (MPEG-2) – MPEG-2 expands the MPEG-1 standard to cover a wider range of applications.

Moving Picture Experts Group 3 (MPEG-3) – MPEG 3 was originally intended for HDTV applications but has since been incorporated into MPEG 2.

Moving Picture Experts Group 4 (MPEG-4) – The goal of MPEG-4 is to establish a universal and efficient coding for different forms of audio-visual data, called audio-visual objects. Coding tools for audio-visual objects are being developed to support various functionality's, such as object-based interactivity and scalability. The syntax of the audio-visual objects is being developed to allow for description of coded objects and to describe how they were coded. This information can then be downloaded into a decoder.

Moving-Coil – A microphone whose generating element is a coil which moves within a magnetic gap in response to sound pressure on the diaphragm attached to it, rather like a small loudspeaker in reverse. The most common type of Dynamic Microphone.

MP (Multi-Link Point-to-Point Protocol)

MP@HL (Main Profile at High Level) – Widely used shorthand notation for a specific quality and resolution of MPEG: Main Profile (4:2:0 quality), High Level (HD resolution).

MP@ML (Main Profile at Main Level) – MPEG-2 specifies different degrees of compression vs. quality. Of these, Main Profile at Main Level is the most commonly used.

MP3 – A commonly used term for the MPEG-1 Layer 3 (ISO/IEC 11172-3) or MPEG-2 Layer 3 (ISO/IEC 13818-3) audio compression formats. MPEG-1 Layer 3 is up to two channels of audio and MPEG-2 Layer 3 is up to 5.1 channels of audio. MP3 is not the same as MPEG-3.

MPC (Multimedia PC) – A specification developed by the Multimedia Council. It defines the minimum platform capable of running multimedia software. PCs carrying the MPC logo will be able to run any software that also displays the MPC logo.

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 perceive light.

MPE – See Multiprotocol Encapsulation.

MPEG – A standard for compressing moving pictures. MPEG uses the similarity between frames to create a sequence of I, B and P frames. Only the I frame contains all the picture data. The B and P frames only contain information relating to changes since the last I frame. MPEG-1 uses a data rate of 1.2 Mbps, the speed of CD-ROM. MPEG-2 support much higher quality with a data rate (also called bit rate) of from 1.2 to 15 Mbps. MPEG-2 is the format most favored for video on demand, DVD, and is the format for transmitting digital television.

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

MPEG Splicing – The ability to cut into an MPEG bitstream for switching and editing, regardless of frame types (I, B, P).

MPEG TS (MPEG Transport Stream) – The MPEG transport stream is an extremely complex structure using interlinked tables and coded identifiers to separate the programs and the elementary streams within the programs. Within each elementary stream, there is a complex structure, allowing a decoder to distinguish between, for example, vectors, coefficients and quantization tables.

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

MPEG-1 – See Moving Picture Experts Group 1.

MPEG-2 – See Moving Picture Experts Group 2.

MPEG-3 – See Moving Picture Experts Group 3.

MPEG-4 – See Moving Picture Experts Group 4.

MPEG-4 Class – MPEG-4 standardizes a number of pre-defined classes. This set of classes is called the MPEG-4 Standard Class Library. The root of MPEG-4 classes is called MPEG-4 Object. In Flexible Mode, an MPEG-4 Terminal, based on this library, will be able to produce or use new encoder-defined classes and instantiate objects according to these class definitions. Graphical methods to represent this hierarchy are commonly used. the OMT notation has been chosen within the context of MPEG-4 Systems.

MPEG-4 Object – The root of MPEG-4 classes.

MPEG-4 Systems – The "Systems" part of the MPEG-4 standard in charge of the Multiplex Layer, the Composition Layer and the Flexibility Layer.

MPEG-4 Systems Description Language (MSDL) – The language(s) defined by MPEG-4 Systems for the purpose of the Flexibility Layer.

MPEG-4 Terminal – An MPEG-4 Terminal is a system that allows presentation of an interactive audiovisual scene from coded audiovisual information. It can be either a standalone application, or part of a multimedia terminal that needs to deal with MPEG-4 coded audiovisual information, among others.

MPEG-7 – MPEG-7 is a multimedia content (images, graphics, 3D models, audio, speech, video) representation standard for information searching. Final specification is expected in the year 2000.

MPEG-J – A set of Java application program interfaces. It also sets the rules for delivering Java into a bitstream and it specifies what happens at the receiving end.

MPI (MPEG Physical Interface)

MPP (Mix to Preset Pattern) – See Preset Pattern.

MPTS (Multi-Port Presentation Time Stamps)

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.

MPU (Microprocessing Unit) – See Microprocessor.

MS Stereo – Exploitation of stereo redundancy in audio programs based on coding the sum and difference signal instead of the left and right channels.

MSB – See Most Significant Bit.

MSDL (MPEG-4 Syntactic or Systems Description Language) – An extensible description language defined in MPEG-4 that allows for selection, description and downloading of tools, algorithms and profiles.

MSI (Medium Scale Integration) – Between 100 and 3,000 transistors on a chip.

MSO (Multiple System Operator) – A major cable TV organization that has franchises in multiple locations.

MTBF (Mean Time Between Failure) – The average time a component works without failure. It is the number of failures divided by the hours under observation.

MTS (Multichannel Television Sound) – A generic name for various stereo audio implementations, such as BTSC and Zweiton. Used in conjunction with NTSC/525. Consists of two independent carriers each carrying a discrete channel. One channel provides stereo sound by providing left/right channel difference signals relative to transmitted mono audio track. The second carrier carries the Secondary Audio Program (SAP) which is used for a second language or a descriptive commentary for the blind. Uses a technique based on the dBx noise reduction to improve the frequency response of the audio channel.

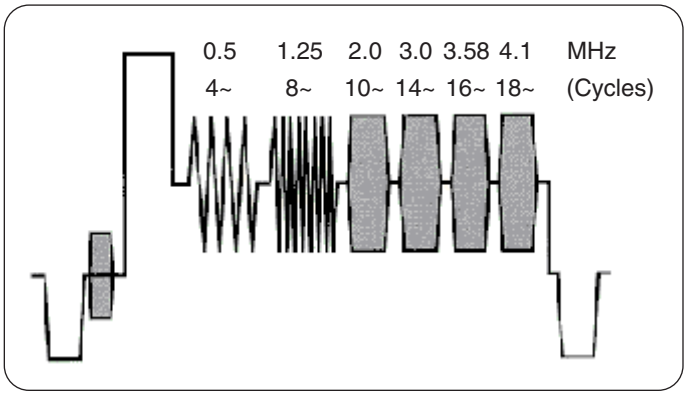
MTTR (Mean Time to Repair) – The average time it takes to repair a failed component.

MTU (Multi-Port Transceiver Unit)

Mu-Law – The PCM coding and companding standard for digital voice communications that is used in North America and Japan for analog-to-digital conversion.

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

Multiburst – Useful for quick approximations of the system's frequency response and can be used as an in-service VIT signal. The multiburst waveform is shown in the figure below.



Multicamera – A production or scene that is shot and recorded from more than one camera simultaneously.

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

MultiCrypt – Is used to describe the simultaneous operation of several conditional access systems.

Multifrequency Monitor – A monitor that accommodates a variety of horizontal and vertical synchronization frequencies. This monitor type accepts inputs from many different display adapters, and is typically capable of either analog or digital input.

Multi-Language Support – A DVD has the ability to store 8 audio streams. This is different than the number of channels each stream might have. Thus, each of the streams might contain a multi-channel audio program in a separate language.

Multi-Layer Effects – A generic term for a mix/effects system that allows mul-tiple video images to be combined into a composite image.

Multilingual – A presentation of dialog in more than one language.

Multimedia – A somewhat ambiguous term that describes the ability to combine audio, video and other information with graphics, control, storage and other features of computer-based systems. Applications include presentation, editing, interactive learning, games and conferencing. Current multimedia systems also use mass storage computer devices such as CD-ROM.

Multimedia Computing – Refers to the delivery of multimedia information delivered via computers.

Multimedia Hypermedia Expert Group (MHEG) – MHEG is another working group under the same ISO/IEC subcommittee that feature the MPEG. The MHEG is the Working Group 12 (WG 12) of Subcommittee 29 (SC 29) of the joint ISO and IEC Technical Committee 1 (JTC 1). The ISO/IEC standards produced have number 13522. MHEG targets coding of multimedia and hypermedia information, and defines an interchange format for composite multimedia contents. The defined MHEG format encapsulates a multimedia document, so to speak, as communication takes place in a specific data structure. Despite the talk about multimedia, there is no very much said and written about MHEG, which seems odd given the realm of MHEG. The present market significance of MHEG is very low, probably due to the high number of proprietary standards for audio visual representation in multimedia PC environments.

Multipath Distortion – A form of interference caused by signal reflec-tions. Signals that are reflected more take a longer path to reach the receiver than those that are reflected less. The receiver will synchronize to the strongest signal, with the weaker signals traveling via different paths causing ghostly images superimposed on the main image. Since many ATV schemes offer increased horizontal resolution, ghosts can have a more deleterious effect on them than on ordinary NTSC signals. There have been many demonstrations of ghost canceling/ eliminating systems and robust transmission systems over the years. It is probable that these will have to be used for HDTV.

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 there is a short clip that starts out in a dialog scene where there are 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 is hard to stay 100% CBR) whereas in multipass VBR mode the encoder will use the bitrate according to its 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 its knowledge on what it previously has encoded.

Multiplane Animation – Multiplane animation refers to a type of cel animation where individual cels are superimposed using the painters algorithm, and their motion relative to each other is controlled. Here, the word "plane" and cel are interchangeable.

Multiple Blanking Lines – Evidenced by a thickening of the blanking line trace or by several distinct blanking lines as viewed on an oscilloscope. May be caused by hum.

Multiple B-Roll – A duplicate of the original source tape, created so that overlays can be merged onto one source tape.

Multiple System Operator (MSO) – A cable TV service provider that operates more than one cable television system.

Multiple-FIFO Architecture – A display controller architecture character-ized by having multiple FIFOs or write buffers. There is typically one FIFO or write buffer at the CPU interface, and one or more FIFOs in the display pipeline.

Multiplex – a) To take, or be capable of taking, several different signals and send them through one source. **b)** To combine multiple signals, usually in such a way that they can be separated again later. There are three major multiplexing techniques. Frequency division multiple (FDM) assigns each signal a different frequency. This is how radio and television stations in the same metropolitan area can all transmit through the same air space and be individually tuned in. Time division multiple (TDM) assigns different signals different time slots. Different programs can be broadcast over the same channel using this technique. More technically, the MADs use TDM for luminance and chrominance. Space or path division multiplex allows differ-ent television stations in different cities to use the same channel at the same time or different people to talk on different telephones in the same building at the same time. **c)** A stream of all the digital data carrying one or more services within a single physical channel. **d)** To transmit two or more signals at the same time or on the same carrier frequency. **e)** To combine two or more electrical signals into a single, composite signal.

Multiplex Code Field (MC Field) – A field in the TransMux/FlexMux-PDU header which specifies, by reference to a Multiplex Table Entry, the logical channel where each byte in the information field belongs.

Multiplex Layer (MUX Layer) – In its broad sense, the combination of the Adaptation Layer, the FlexMux Layer, the Protection Layer and the TransMux Layer. In a more strict interpretation, the FlexMux or the TransMux.

Multiplex Layer Protocol Data Unit (MUX-PDU) – An information unit exchanged between peer Multiplex Layer entities.

Multiplex Layer Service Data Unit (MUX-SDU) – A logical information unit whose integrity is preserved in transfer from one Multiplex Layer User to the peer Multiplex Layer User.

Multiplex Layer User (MUX-User) – An entity which makes use of the services of the MUX Layer.

Multiplex Table – A table which specifies the multiplexing pattern for the information field of a MUX-PDU).

Multiplexed Analog Component – See MAC.

Multiplexer (MUX) – Device for combining two or more electrical signals into a single, composite signal.

Multiplexing – Process of transmitting more than one signal via a single link. The most common technique used in microprocessor systems is time division multiplexing, in which one signal line is used for different information at different times.

Multiplier – A control circuit in which a non-video control signal is faded down as the other is faded up.

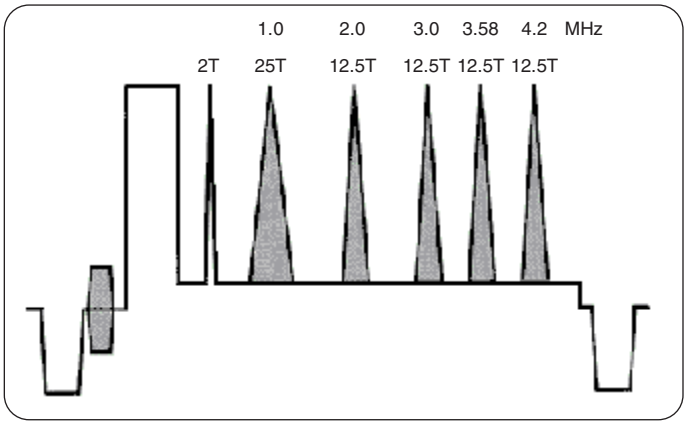
Multipoint Conferencing Server (MCS) – A hardware or software H.323 device that allows multiple video conferencing (or audio or data) users to connect together. Without an MCS typically only point-to-point conferences can take place. Commonly supports voice activated switching, where whoever is talking is broadcast to all users, but new systems support "Hollywood Squares", where multiple windows show each participant. ITU-T standard H.231 describes the standard way of doing this. Many current systems only support H.320 (ISDN) but many vendors are working to upgrade their products to support H.323 (LAN, Internet) as well. In the H.320 space, this functionality is referred to as a multipoint control unit (MCU). Sometimes these terms are used interchangeably, although they refer to somewhat different implementations.

Multipoint Control Unit (MCU) – A switching device commonly used to switch and control a video conferencing network allowing multiple sites to conference simultaneously.

Multipoint Controller (MC) – Used for conference control of three or more terminals. It allocates bandwidth.

Multiprotocol Encapsulation (MPE) – The data broadcast specification profile for multiprotocol encapsulation supports data broadcast services that require the transmission of datagrams of communication protocols via DVB compliant broadcast networks. The transmission of datagrams according to the multiprotocol encapsulation specification is done by encapsulating the datagrams in DSM-CC sections., which are compliant with the MPEG-2 private sector format.

Multipulse – A variation of the sine-squared pulses. Multipulse allows for the simultaneous evaluation of group-delay errors and amplitude errors at the various frequencies. Distortions show up in multipulse as distortions of the baseline. Refer to the figure and to the Sine-Squared pulse discussion.



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

Multi-Scan Monitor – A monitor (also referred to as multi-sync or multi-frequency) which can synchronize to different video signal sync frequencies, allowing its use with various computer video outputs. See Analog Monitor.

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

Multi-Standard – TV sets, VTRs, etc., that are designed to work using more than one technical standard; i.e., a VTR which can record both NTSC and PAL signals/recordings is a multi-standard machine.

Multitrack – A magnetic tape of film recorder capable of recording more than one track at a time.

Multitrack Tape – A piece of magnetic tape which can be used to store two or more discrete signals.

Munsell Chroma – a) Illuminating Engineering: The index of perceived (Y) and chromaticity coordinates (x,y) for CIE Standard Illuminance C and the CIE Standard Observer. **b)** Television: The dimension of the Munsell system of color that corresponds most closely to saturation. Note: Chroma is frequently used, particularly in English works, as the equivalent of saturation.

Munsell Color System – A system of surface-color specifications based on perceptually uniform color scales for the three variables. Munsell hue, Munsell value, and Munsell chroma. For an observer of normal color vision, adapted to daylight and viewing the specimen when illuminated by daylight and surrounded with a middle gray to white background, the Munsell hue, value, and chroma of the color correlate well with the hue, lightness, and perceived chroma.

MUSE (Multiple Sub-Nyquist Sampling Encoding) – a) 16:9 aspect ratio, high definition, widescreen television being proposed in Japan. **b)** A term originally used for a transmission scheme developed by NHK specifically for DBS transmission of HDTV. MUSE has since been extended to a family of ATV transmission schemes. MUSE, as it was originally developed, is a form of MAC. Recent versions of MUSE (MUSE- and MUSE-9) are said to be receiver-compatible and, as such, cannot employ MAC techniques. The sub-Nyquist part of the name indicates that MUSE is a sub-sampling system and, as such, is subject to motion artifacts. While it is one of the oldest ATV transmission schemes still considered viable, MUSE is only four years old.

MUSE-6 – A family of three versions of an ATV transmission scheme said to be both receiver-compatible and channel-compatible. Since the original MUSE schemes are neither, there is little similarity between them, other than the use of sub-sampling. The differences between the three versions relate to how the wide aspect ratio is handled and what techniques are used for augmentation in an ATV set. Two versions of MUSE-6 use the letterbox technique for aspect ratio accommodation and both of these use blanking stuffing in the expanded VBI area for vertical resolution enhancement. The differences between the two versions relate to the duration of the sub-sampling sequence (one frame or two). The third uses the truncation technique for aspect ratio accommodation, sending the side panels stuffed into the existing VBI and HBI. Additional horizontal detail is transmitted via two-frame sub-sampling.

MUSE-9 – A family of three versions of an ATV transmission scheme said to be receiver-compatible and utilizing a 3 MHz augmentation channel. The three versions are very similar to the three versions of MUSE-6, except that the version using the truncation method sends the wide-screen panels on the augmentation channel rather than stuffing them into the HBI and the VBI. There are two classes of the three versions of MUSE-9, one with a contiguous augmentation channel and one without. The one without is said to be somewhat inferior in quality to the one with.

MUSE-E – MUSE optimized for emission (i.e., broadcasting) rather than transmission (i.e., satellite distribution). It is a non-receiver-compatible, non-channel-compatible scheme occupying 8.1 MHz of base bandwidth and requiring four fields to build up a full-resolution picture. Thus, it requires motion compensation (and retains some motion artifacts). It offers four channels of high-quality digital audio. It has been tested in the Washington, DC area.

MUSE-II – See MUSE-E.

MUSE-T – MUSE optimized for transmission (via satellite) rather than emission (via terrestrial broadcasting). It occupies twice the bandwidth of MUSE-E (16.2 MHz), but is otherwise quite similar.

Music and Effects Track(s) – Music and effects audio without video. Can be on one track, on different tracks on one piece of film or tape, or on different tapes, which are combined during an audio "track mix" session. Sometimes abbreviated M&E.

MUSICAM (Masking Pattern Adapted Universal Sub-Band Integrated Coding and Multiplexing) – Compression method for audio coding.

Must Carry – Legal requirement that cable operators carry local broadcast signals. Cable systems with 12 or fewer channels must carry at least three broadcast signals; systems with 12 or more channels must carry up to one-third of their capacity; systems with 300 or fewer subscribers are exempt. The 1992 Cable Act requires broadcast station to waive must-carry rights if it chooses to negotiate retransmission compensation (see Retransmission consent).

MUX – See Multiplexer.

Mux Rate – Defined by MPEG-2 as the combined rate of all video and audio elementary stream packets common to one program or multi-program stream. The rate of a stream is set based upon a user selection, by the quality of the program (i.e., constant quality variable rate), or by the symbol rate required from an RF transponder. This rate also includes the VBI and sub-picture private stream data, which MPEG treats as a private stream type. Mux rate is always specified as 10.08 Mbps because this is the rate at which user data arrives into the track buffer.

MVDS (Multi-Point Video Distribution System)

MXF (Material Exchange Format) – An object subset of AAF and is on the verge of becoming a SMPTE standard. MXF was designed for less complex (less vertically rich) metadata applications, such as news editing and video streaming from servers. Because of its flatter metadata structure, it is better suited to be used as a metadata wrapper within a video signal or a TCP/IP stream. It offers performance benefits over the more complex AAF file structure because of its streamable nature.

MXF DMS-1 – The MXF development community has been working on a specific dialect for Descriptive Metadata, called MXF DMS-1, which is being designed to describe people, places, times, production billing.

Mylar – A registered trademark of E.I. duPont de Nemours & Co., designating their polyester film.

▶ N

NAB (National Association of Broadcasters) – An association which has standardized the equalization used in recording and reproducing. This is a station owner and/or operator's trade association. NAB is also a participant in ATV testing and standardization work, and a charter member of ATSC. Though not a proponent of any particular ATV system, NAB lobbies for the interests of broadcasting as a delivery mechanism and has published some of the least biased information on the subject.

NAB Curves, NAB Equalization – Standard playback equalization curves for various tape speeds, developed by the National Association of Broadcasters.

NAB Reel, NAB Hub – Reels and hubs used in professional recording, having a large center hole and usually an outer diameter of 10-1/2".

NABET (National Association of Broadcast Employees and Technicians) – NABET is a union of technicians that supplies members for many videotape, live and film productions.

NABTS – See North American Broadcast Teletext Specification.

Nagra – A brand of audio tape recorder using 1/4" wide audio tape extensively used for studio and location separate audio recording.

NAM – See Non-Additive Mix.

NANBA (North American National Broadcasters Association)

Nanosecond – One billionth of a second: 1 x 10-9 or 0.000000001 second.

NAP (North American Philips) – Philips Laboratories developed the HDS-NA ATV scheme and was among the first to suggest advanced pre-combing. See also PCEC.

Narrow MUSE – An NHK-proposed ATV scheme very similar to MUSE (and potentially able to use the same decoder) but fitting within a single, 6 MHz transmission channel. Unlike MUSE-6 and MUSE-9, narrow MUSE is not receiver-compatible.

Narrowband – Relatively restricted in bandwidth.

Narrowband ISDN (N-ISDN) – Telecommunications at 1.5 Mbps on copper wire.

Narrowcasting – Broadcasting to a small audience.

National Television System Committee (NTSC) – a) The organization that formulated the "NTSC" system. Usually taken to mean the NTSC color television system itself, or its interconnect standards. NTSC is the television standard currently in use in the U.S., Canada and Japan. NTSC image format is 4:3 aspect ratio, 525 lines, 60 Hz and 4 MHz video bandwidth with a total 6 MHz of video channel width. NTSC uses YIQ. NTSC-1 was set in 1948. It increased the number of scanning lines from 441 to 525, and replaced AM sound with FM. b) The name of two standardization groups, the first of which established the 525 scanning-line-per-frame/30 frame-per-second standard and the second of which established the color television system currently used in the U.S.; also the common name of the NTSC-established color system. NTSC is used throughout North America and Central America, except for the French islands of St. Pierre and Miquelon. It is also used in most of the Caribbean and in parts of South America, Asia, and the Pacific. It is also broadcast at U.S. military installations throughout the world and at some oil facilities in the Middle East. Barbados was the only country in the world to transmit NTSC color on a non-525-line system; they have since switched to 525 lines. Brazil remains the only 525-line country to transmit color TV that is not NTSC; their system is called PAL-M. M is the CCIR designation for 525-line/30 frame television. See also M.

Native BIFS Node – A Binary Format for Scenes (BIFS) node which is introduced and specified within the Final Committee Draft of International Standard as opposed to non-native BIFS node, which is a node referenced from ISO/IEC 14772-1.

Native Resolution – The resolution at which the video file was captured.

NAVA (National Audio-Visual Association) – A trade association for audio-visual dealers, manufacturers and producers.

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

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

NBC – Television network that was an original proponent of the ACTV ATV schemes. NBC was also the first network to announce its intention to shift from NTSC entirely to CAV recording equipment.

NB (National Body) – Responsible for developing national positions for international voting.

NBC (Non-Backwards Compatible)

NCTA (National Cable Television Association) – This is the primary cable TV owner and/or operator's trade association. NCTA is performing similar roles to NAB in ATV research and lobbying, with an emphasis on CATV, rather than broadcasting, of course, and is a charter member of ATSC.

NDA (Non-Disclosure Agreement) – An agreement signed between two parties that have to disclose confidential information to each other in order to do business. In general, the NDA states why the information is being divulged and stipulates that it cannot be used for any other purpose. NDAs are signed for a myriad of reasons including when source code is handed to another party for modification or when a new product under development is being reviewed by the press, a prospective customer or other party.

NE (Network Element) – In general, an NE is a combination hardware and software system that is designed primarily to perform a telecommunications service function. For example, an NE is the part of the network equipment where a transport entity (such as a line, a path, or a section) is terminated and monitored. As defined by wavelength routing, an NE is the originating, transient, or terminating node of a wavelength path.

Near Instantaneous Companded Audio Multiplex (NICAM) –
a) A digital audio coding system originally developed by the BBC for point to point links. A later development, NICAM 728 is used in several European countries to provide stereo digital audio to home television receivers.
b) A digital two-channel audio transmissions with sub-code selection of bi-lingual operation. Stereo digital signals with specifications approaching those of compact disc are possible. NICAM uses a 14 bit sample at a 32 kHz sampling rate which produces a data stream of 728 kbits/sec.

Negative – a) A film element in which the light and dark areas are reversed compared to the original scene; the opposite of a positive.
b) A film stock designed to capture an image in the form of a negative.

Negative Effect – Special effect in which either blacks and whites are reversed or colors are inverted. For example, red becomes a blue-green, green becomes purple, etc. The Video Equalizer and Digital Video Mixer includes a negative effect which can be used to generate electronic color slides from color negatives. An electronic color filter can be used for fine adjustment of the hues.

Negative Image – Refers to a picture signal having a polarity which is opposite to normal polarity and which results in a picture in which the white areas appear as black and vice versa.

Negative Logic – The logic false state is represented by the more positive voltage in the system, and the logic true state is represented by the more negative voltage in the system. For TTL, 0 becomes +2.4 volts or greater, and 1 becomes +0.4 volts or less.

Nested – Subroutine that is called by another subroutine or a loop within a larger loop is said to be nested.

NET (National Educational Television) – A public TV Network of stations.

Network – a) A group of stations connected together for common broadcast or common business purposes; multiple circuits. **b)** A group of computers and other devices (such as printers) that can all communicate with each other electronically to transfer and share information. **c)** A collection of MPEG-2 Transport Stream (TS) multiplexes transmitted on a single delivery system, e.g., all digital channels on a specific cable system.

Network Administrator – The individual responsible for setting up, maintaining, and troubleshooting the network, and for supplying setup information to system administrators of each system.

Network Interface Card (NIC) – A device that connects a terminal to a network.

Neutral – Normal; without power; not in working position; without much color or brightness purposes; multiple circuits.

Neutral Colors – The range of gray levels, from black to white, but without color. For neutral areas in the image, the RGB signals will all be equal; in color difference formats, the color difference signals will be zero.

New York Institute of Technology – Private engineering school headquartered in Old Westbury, NY, noted for its advanced computer graphics. Its Science and Technology Research Center, in Dania, FL, has been researching ATV for years. NYIT is a proponent of the VISTA ATV scheme.

NexTView – An electronic program guide (EPG) based on ETSI ETS 300 707.

NFS™ (Network File System) – A distributed file system developed by Sun that enables a set of computers to cooperatively access each other's files transparently.

NG – An often-used term meaning "no good".

NHK – See Nippon Hoso Kyokai.

Nibble – Four bits or half a byte. A group of four contiguous bits. A nibble can take any of 16 (24) values.

NiCad (Nickel Cadmium) – Common Rechargeable video camera battery type.

NICAM – See Near Instantaneous Companded Audio Multiplexer.

NICAM 728 – A technique of implementing digital stereo audio for PAL video using another audio subcarrier. The bit rate is 728 kbps. It is discussed in BS.707 and ETSI EN 300 163. NICAM 728 is also used to transmit non-audio digital data in China.

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

Nippon Hoso Kyokai (NHK) – The Japan Broadcasting Corporation, principal researchers of HDTV through the 1970s, developers of the 1125 scanning-line system for HDEP and of all the MUSE systems for transmission.

Nippon Television – See NTV.

NIST (National Institute of Standards and Technology) – This is the North American regional forum at which OSI implementation agreements are decided. It is equivalent to EWOS in Europe and AOW in the Pacific.

NIT (Network Information Table) – The NIT conveys information relating to the physical organization of the multiplex, transport streams carried via a given network, and the characteristics of the network itself. Transport streams are identified by the combination of an original network ID and a transport stream ID in the NIT.

Nits – The metric unit for brightness. 1 foot lambert = 3.425 nits.

NIU (Network Interface Unit) – A device that serves as a common interface for various other devices within a local area network (LAN), or as an interface to allow networked computers to connect to an outside network. The NIU enables communication between devices that use different protocols by supplying a common transmission protocol, which may be used instead of the device's own protocols, or may be used to convert the specific device protocol to the common one. To enable an interface between a LAN and another network, the NIU converts protocols and associated code and acts as a buffer between the connected hardware. A network interface card (NIC) is a type of NIU.

NLM (Network Loadable Module) – Software that runs in a NetWare server. Although NetWare servers store DOS and Windows applications, they do not execute them. All programs that run in a NetWare server must be compiled into the NLM format.

NMI (Non-Maskable Interrupt) – A hardware interrupt request to the CPU which cannot be masked internally in the processor by a bit, but must be serviced immediately.

NNI (Nederlands Normalisatie-Instituut) – Standards body in the Netherlands.

Node – a) A list of calculations that you can apply to materials as part of the rendering tree language. The node can in turn serve as input to other nodes. **b)** Any signal line connected to two or more circuit elements. All logic inputs and outputs electrically connected together are part of the same node.

Nodules – Clusters of materials, i.e., a large nodule of iron oxide on magnetic tape would be a tape defect.

Noise – Any unwanted electrical disturbances, other than crosstalk or distortion components, that occur at the output of the reproduce amplifier. System Noise: The total noise produced by the whole recording system, including the tape. Equipment Noise: The noise produced by all the components of the system, with the exception of the tape. Tape Noise: The noise that can be specifically ascribed to the tape. There are several sources of tape noise. See DC Noise, Erase Noise, Modulation Noise, Saturation Noise, and Zero Modulation Noise.

Noise Bars – White streaks in a picture, usually caused when video heads trace parts of the tape that have no recorded signal.

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

Noise Gate – A device used to modify a signal's noise characteristics. In video, noise gates provide optimal automatic suppression of snow (signal noise level). In audio, a noise gate provides a settable signal level threshold below which all sound is removed.

Noise Pulse – A spurious signal of short duration that occurs during reproduction of a tape and is of magnitude considerably in excess of the average peak value of the ordinary system noise.

Noise Reduction – The amount in dB that the noise added to a signal by transmission or storage chain, especially a tape recorder, is reduced from the level at which it would be if no noise reduction devices were used.

Noise Reduction Systems – Refers to electronic circuits designed to minimize hiss level in magnetic recording.

Noise Weighting – An adjustment used in the electrical measurement of television signal noise values to take into account the difference between the observable effect of noise in a television picture and the actual electrical value of noise.

Noise/A-Weighted – Unwanted electrical signals produced by electronic equipment or by magnetic tape. Mostly confined to the extremes of the audible frequency spectrum where it occurs as hum and/or hiss. A-weighted noise is noise measured within the audio frequency band using a measuring instrument that has a frequency selective characteristic. The frequency sensitivity of the measuring instrument is adjusted to correspond to that of the average human hearing response.

Noisy – A description of a picture with abnormal or spurious pixel values. The picture's noise is a random variation in signal interfering with the information content.

Noisy Video – Noisy video (e.g., video from low quality VTRs) is more difficult to code than the cleaner version of the same sequence. The reason is that the video encoder spends many bits trying to represent the noise as if it were part of the image. Because noise lacks the spatial coherence of the image, it is not coded efficiently.

Nomograph – This is a table that allows for the determination of Chrominance to Luminance Gain and Delay errors. Refer to the discussion on Chrominance to Luminance Gain and Delay.

Non-Additive Mix (NAM) – The process of combining two video signals such that the resultant video signal is instant-by-instant the same as the brighter of the two weighted input signals. For example, at 50% fader, the brighter of the two videos predominates. The net effect of this type of mix is a superimposed appearance, with the picture balance controlled by the fader.

Non-Compatible – Incapable of working together.

Noncomposite Video – A video which does not contain a synchronizing pulse.

Nondirectional – A pickup pattern which is equally sensitive to sounds from all directions.

Non-Drop Frame – System of time code that retains all frame numbers in chronological order, resulting in a slight deviation from real clock time.

Non-Drop Frame Time Code – SMPTE time code format that continuously counts a full 30 frames per second. Because NTSC video does not operate at exactly 30 frames per second, non-drop frame time code will count 108 more frames in one hour than actually occur in the NTSC video in one hour. The result is incorrect synchronization of time code with clock time. Drop frame time code solves this problem by skipping or dropping 2 frame numbers per minute, except at the tens of the minute count.

Non-Ferrous – Without iron or iron oxide.

Noninterlaced – Method of scanning video in which the entire frame is scanned at once rather than interleaved. The rate of scan must be fast enough that the average light level of the scene does not decrease between scans and cause flicker. Another term for a noninterlaced system is progressive scan.

Non-Intra Coding – Coding of a macroblock or picture that uses information both from itself and from macroblocks and pictures occurring at other times.

Nonlinear – A term used for editing and the storage of audio, video and data. Information (footage) is available anywhere on the media (computer disk or laser disc) almost immediately without having to locate the desired information in a time linear format.

Nonlinear Distortion – Amplitude-dependent waveform distortion. This includes APL and instantaneous signal level changes. Analog amplifiers are linear over a limited portion of their operating range. Signals which fall outside of the linear range of operation are distorted. Nonlinear distortions

include crosstalk and intermodulation effects between the luminance and chrominance portions of the signal.

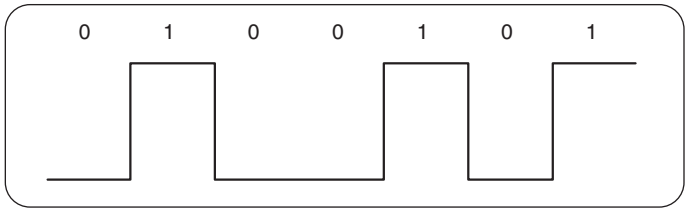
Nonlinear Editing (NLE) – a) The process of editing using rapid retrieval (random access) computer controlled media such as hard disks, CD-ROMs and laser discs. Its main advantages are: allows you to reorganize clips or make changes to sections without having to redo the entire production and very fast random access to any point on the hard disk (typically 20-40 ms). **b)** Nonlinear distinguished editing operation from the "linear" methods used with tape. Nonlinear refers to not having to edit material in the sequence of the final program and does not involve copying to make edits. It allows any part of the edit to be accessed and modified without having to re-edit or re-copy the material that is already edited and follows that point. Nonlinear editing is also non-destructive, the video is not changed but the list of how the video is played back is modified during editing.

Nonlinear Editor – An editing system based on storage of video and audio on computer disk, where the order or lengths of scenes can be changed without the necessity of reassembling or copying the program.

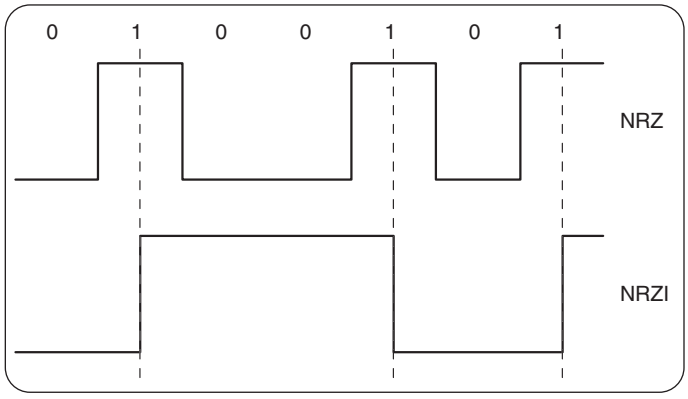
Nonlinear Encoding – Relatively more levels of quantization are assigned to small amplitude signals, relatively fewer to the large signal peaks.

Nonlinearity – The amount by which a measured video signal output differs from a standard video signal output. The greater this deviation, the greater the video signal distortion and possibility of luminance and chrominance problems. Having gain vary as a function of signal amplitude.

Non-Return-to-Zero (NRZ) – A coding scheme that is polarity sensitive. 0 = logic low; 1 = logic high.



Non-Return-to-Zero Inverse (NRZI) – A video data scrambling scheme that is polarity insensitive. 0 = no change in logic; 1 = a transition from one logic level to the other.



Non-Synchronous – Separate things not operating together properly, i.e., audio and video or the inability to properly operate together with another specific piece of equipment or signal. See Synchronous.

Non-Synchronous Source – A video signal whose timing information differs from the reference video by more than 800 ns.

Non-Uniform B-Splines (NURBS) – A superset of both Bézier and Uniform B-Splines. NURBS introduces the feature of non-uniformity. Thus it is possible to subdivide a spline, for example, to locally increase the number of control points without changing the shape of the spline. This is a powerful feature which enables you to insert more control points on a spline without altering its shape; cut anywhere on a spline to generate two parts; and creates cusps in splines.

Non-Useful DC Component – Produced by the transmission equipment and not related to picture content. The non-useful DC component present across the interface point, with or without the load impedance connected, shall be zero +/-50 µV.

Normal – a) Relating to the orientation of a surface or a solid, a normal specifies the direction in which the outside of the surface or the solid faces. **b)** The normal to a plane is the direction perpendicular to the surface.

Normal Key – On the 4100 series, an RGB chroma key or a luminance key, as distinct from a composite (encoded) chroma key.

Normal/Reverse – The specification of the direction a pattern moves as the fader is pulled. A normal pattern starts small at the center and grows to the outside while a reverse pattern starts from the edge of the screen and shrinks. Normal/Reverse specifies that the pattern will grow as the fader is pulled down, and shrink as it is pushed up. This definition loses some meaning for wipes that do not have a size per-se such as a vertical bar, however, this feature still will select the direction of pattern movement.

North American Broadcast Teletext Specification – Provisions for 525-line system C teletext as described in EIA-516 and ITU-R BT.653.

NOS (Network Operating System) – Generic term used to refer to what are really distributed file systems. Examples of NOSs include LAN Manager, NetWare, NFS, and VINES.

Notch Filter – A device which attenuates a particular frequency greatly, but has little effect on frequencies above or below the notch frequency.

Notifier – A form that appears when the system requires you to confirm an operation that you just requested, or when an error occurs.

NRZ – See Non-Return-to-Zero.

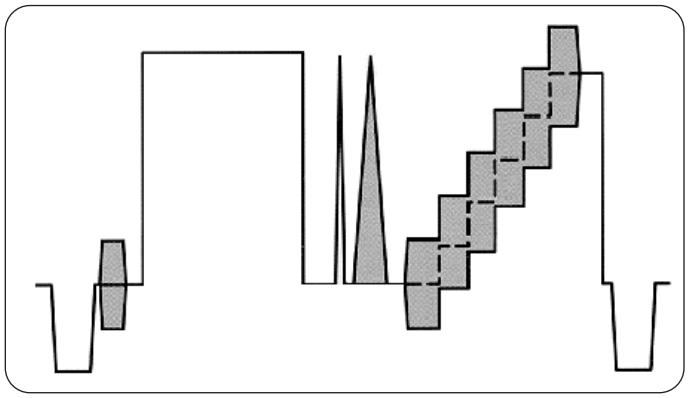
NRZI – See Non-Return-to-Zero Inverse.

NSAP (Network Service Access Point) – Network addresses, as specified by ISO. An NSAP is the point at which OSI network service is made available to a Transport Layer (Layer 4) entity.

NSF (Norges Standardiseringsforbund) – Standards body of Norway.

NST (Network Status Table) – The network status table shows the network name, the protocol, the interface over which the network runs (eth:1 for LAN, atm:1 or hdlc:1 for WAN), how the network was created (static for LAN, dynamic for WAN) and the network address assigned to the connection.

NTC-7 Composite Test Signal



NTFS (New Technology File System) – A file system used on Windows computers.

NTSC – See National Television System Committee.

NTSC 4.43 – This is a NTSC video signal that uses the PAL color subcarrier frequency (about 4.43 MHz). It was developed by Sony in the 1970s to more easily adapt European receivers to accept NTSC signals.

NTSC Artifacts – Defects associated with NTSC.

What's Wrong with NTSC

A. Monochrome and Color Defects

1. Due to Sampling
   - Temporal Alias
   - Vertical Alias
   - Vertical Resolution Loss (Kell Factor)
2. Due to aperture
   - Visible Scannig Lines
   - Soft Vertical Edges
3. Due to Interlace
   - Twitter
   - Line Crawl
   - Vertical Resolution Loss (Interlace Coefficient)
   - Motion Artifacts, Vertical and Horizontal
4. Due to Transmission
   - Ghosts
   - ICPM
   - Group Delay
   - Impulsive Noise
   - Periodic Noise
   - Random Noise
   - Interference
   - Filter Artifacts
5. Due to Changing Equipment
   - Non-Linear System Gamma

B. Color Defects

1. Visible in Monochrome
   - Cross Luminance
   - Visible Subcarrier
   - Chroma Crawl
   - Gamma Problems
   - Detail Loss Due to Filters
   - Ringing Due to Filters
2. Visible in Color
   - Cross Color
   - Detail Loss Due to Filters
   - Ringing Due to Filters

C. Characteristics of the System (Not Necessarily Defects)

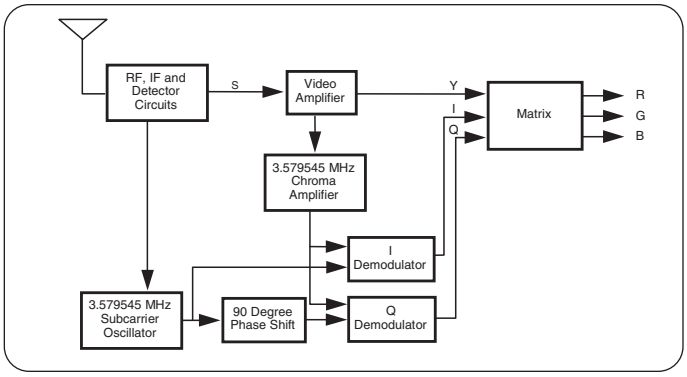
1. 4:3 Aspect Ratio
2. 330 x 330 Resolution
3. NTSC Colorimetry
4. 15 kHz Sound

NTSC Color – The color signal TV standard set by the National Television Standards Committee of the USA.

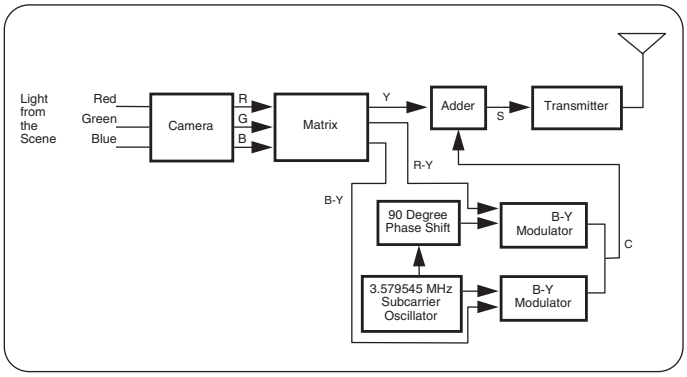
NTSC Color Bars – The pattern comprising eight equal-width color bars generated by an NTSC generator. The color bars are used for calibration and as a reference to check transmission paths, signal phase, recording and playback quality, and monitor alignment.

NTSC Composite – The video signal standard proposed by the NTSC and adopted by the FCC for broadcast television in the U.S. The signal is an interlaced composite video signal of 525 lines and 60 fields per second (30 frames per second), with a bandwidth limited to 4 MHz to fit into a 6 MHz broadcast television channel without interfering with adjacent channels.

NTSC Composite Video Receiver System



NTSC Composite Video Transmitter System



NTSC Decoder – An electronic circuit that breaks down the composite NTSC video signal into its components.

NTSC Format – A color television format having 525 scan lines (rows) of resolution at 30 frames per second (30 Hz). See NTSC. Compare PAL Format.

NTSC MUSE – Term sometimes used for MUSE-6 and MUSE-9.

NTSC RGB – Interlaced red, green, and blue video signals timed to NTSC standards. Refers to the three monochrome signals that represent the primary colors of an image. Contrast with Component Video.

NTSC Standard – Documentation of the characteristics of NTSC. NTSC is defined primarily in FCC Part 73 technical specifications. Many of its characteristics are defined in EIA-170A. NTSC is also defined by the CCIR.

NTSC is a living standard; as problems with it are discovered, they are corrected. For example, a former EIA standard, RS-170, omitted any phase relationship between luminance and chrominance timing, resulting in blanking problems. EIA-170A defines that relationship (called SC/H for subcarrier to horizontal phase relationship). See also True NTSC.

NTSC-M – The U.S. standard of color television transmissions. See also NTSC and M.

NTU (Network Termination Unit) – An Network Termination Unit is a device located at the final interconnect point between the PSTN (Public Switched Telephone Network) and the customers own equipment.

NTV (Nippon Television Network) – A Japanese broadcaster that is a proponent of ATV schemes similar to Faroudja's SuperNTSC. NTV's first generation EDTV system would use high line-rate and/or progressive scan cameras with prefiltering, adaptive emphasis, gamma correction, ghost cancellation, a progressive scan display, and advanced decoding at the receiver. The second generation would add more resolution, a widescreen aspect ratio, and better sound. The first generation is scheduled to be broadcast beginning in 1988.

Null Packets – Packets of "stuffing" that carry no data but are necessary to maintain a constant bit rate with a variable payload. Null packets always have a PID of 8191.

Number Crunching – Action of performing complex numerical operations.

Numerical Aperture – A number that defines the light gathering ability of a specific fiber. The numerical aperture is equal to the sine of the maximum acceptance angle.

NVOD (Near Video On Demand) – This service allows for a single TV program to be rebroadcast consecutively with a few minutes of difference in starting time. For example, a movie could be transmitted at 9:00, 9:15 and 9:30.

NWK – See Network.

NYIT – See New York Institute of Technology.

Nyquist – Nyquist Filter, Nyquist Limit, Nyquist Rule, and Harry Nyquist, for whom they are named.

Nyquist Filter – Commonly used in the IF stage of a television receiver to separate the desired television channel from potential interference.

Nyquist Frequency – 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 Interval – The maximum separation in time which can be given to regularly spaced instantaneous samples of a wave of bandwidth W for complete determination of the waveform of the signal. Numerically, it is equal to 1/2 W seconds.

Nyquist Limit – When time-varying information is sampled at a rate R, the highest frequency that can be recovered without alias is limited to R/2. Aliasing may be generated by under sampling temporally in frame rate, or vertically in lines allocated to image height, or horizontally in analog bandwidth or in pixel allocation. Intermodulations prior to band limiting may "preserve" some distracting effects of aliasing in the final display. Note: Sampling at a rate below the Nyquist limit permits mathematical confirmation of the frequencies present (as for example in a Fourier analysis of recorded motion). If the sampling window is very small (as in synchronized flash exposure), however, it may become a subjective judgment whether strobing is perceived in the image for motion approaching the limiting velocity (frequency).

Nyquist Rate Limit – Maximum rate of transmitting pulse signals through a channel of given bandwidth. If B is the effective bandwidth in Hertz, then 2B is the maximum number of code elements per second that can be received with certainty. The definition is often inverted, in effect, to read "the theoretical minimum rate at which an analog signal can be sampled for transmitting digitally".

Nyquist Rule – States that in order to be able to reconstruct a sampled signal without aliases, the sampling must occur at a rate of more than twice the highest desired frequency. The Nyquist Rule is usually observed in digital systems. For example, CDs have a sampling frequency of 44.1 kHz to allow signals up to 20 kHz to be recorded. It is, however, frequently violated in the vertical and temporal sampling of television, resulting in aliases. See also Alias.

Nyquist Sampling – Sampling at or above twice the maximum bandwidth of a signal. This allows the original signal to be recovered without distortion.

Nyquist Sampling Theorem – Intervals between successive samples must be equal to or less than one-half the period of highest frequency.

O

OAM (Operation, Administration and Maintenance) – ATM Forum specification for cells used to monitor virtual circuits. OAM cells provide a virtual circuit level loopback in which a router responds to the cells, demonstrating that the circuit is up and the router is operational.

Object Based Coding (OBC) – A technique that codes arbitrarily shaped objects within a scene. Transmitted parameters are shape, color and motion.

Object Carousels – The object carousel specification has been added in order to support data broadcast services that require the periodic broadcasting of DSM-CC user-user (U-U) objects through DVB compliant broadcast networks, specifically as defined by DVB systems for interactive services (SIS). Data broadcast according to the DVB object carousel specification is transmitted according to the DSM-CC object carousel and DSM-CC data carousel specification which are defined in MPEG-2 DSM-CC.

Object Clock Reference (OCR) – A clock reference that is used by a media object hierarchy. This notation has been chosen within the context of the MPEG-4 Systems.

Object Content Information (OCI) – Additional information about content conveyed through one or more elementary streams. It is either attached to individual elementary stream descriptors or conveyed itself as an elementary stream.

Object Descriptor (OD) – A descriptor that associates one or more elementary streams by means of their elementary stream descriptors and defines their logical dependencies.

Object Descriptor Message – A message that identifies the action to be taken on a list of object descriptors or object descriptor lds, for example, update or remove.

Object Descriptor Stream – An elementary stream that conveys object descriptors encapsulated in object descriptor messages.

Object Modeling Technique (OMT) – A graphical method to represent the class hierarchy. This notation has been chosen within the context of the MPEG-4 Systems.

Object Program – End result of the source language program (assembly or high-level) after it has been translated into machine language.

Object Time Base (OTB) – a) The OTB defines the notation of time of a given encoder. All time stamps that the encoder inserts in a coded audiovisual object data stream refer to this time base. **b)** A time base valid for a given object, and hence for its media object decoder. The OTB is conveyed to the media object decoder via object clock references. All time stamps relating to this object's decoding process refer to this time base.

Objects – Objects, in the object-oriented terminology, are entities that combine a data structure (defining the object's state), with a set of methods (defining the object's behavior).

Objective – The very first optical element at the front of a lens.

OBO (Output Back-Off) – The ratio of the signal power measured at the output of a high power amplifier to the maximum output signal power. The output back-off is expressed in decibels as either a positive or negative quantity. It can be applied to a single carrier at the output to the HPA (carrier OBO), or to the ensemble of output signals (total OBO).

OC1 (Optical Carrier Level 1) – A signal with a bitrate of 51.8 Mbps. Fundamental transmission rate for SONET.

OC12 (Optical Carrier Level 12) – A signal with a bitrate of 622 Mbps.

OC3 (Optical Carrier Level 3) – A 155 Mbps ATM SONET signal stream that can carry three DS-3 signals. Equivalent to SDH STM-1.

OC48 (Optical Carrier Level 48) – A signal with a bitrate of 2.4 Gbps.

Occlusion – The process whereby an area of the video raster is blocked or made non-transparent by controlling selected bits. Occlusion is used when more than one picture is displayed or windowed simultaneously.

OCT (Octal Notation) – Any mathematical notation that uses 8 different characters (usually the digits 0 to 7).

Octal – Base 8 number system. Often used to represent binary numbers, since each octal digit corresponds directly to three binary digits.

Octave – A two-to-one frequency ratio.

Ocular – The very last optical element at the back of a lens (the one closer to the CCD chip).

Odd Number – The number of scanning lines per frame necessary in an interlaced scanning system. One line is split between fields to ensure proper spacing between scanning lines from different fields. A progressively scanned system may use an even number of scanning lines.

OEM (Original Equipment Manufacturer) – A company which develops, produces and sells computer and consumer hardware to other companies.

Oersted – A unit of magnetic field strength.

OFDM (Orthogonal Frequency Division Multiplex) – First promoted in the early 1990s as a wireless LAN technology. OFDM's spread spectrum technique distributes the data over a large number of carriers that are spaced apart at precise frequencies. This spacing provides the "orthogonality" in this technique which prevents the demodulators from seeing other frequencies than their own. Coded OFDM (COFDM) adds forward error correction to the OFDM method.

Off-Line, Offline – Preliminary editing done on relatively low-cost editing systems, usually to provide an EDL for final on-line editing and assembly of the finished show.

Off-Line Edit – Rough cut editing used to produce an Edit Decision List.

Off-Line Editing – Editing that is done to produce an edit decision list, which is used later for assembling that program. A video tape (sometimes called a work print) may be produced as a by-product of off-line editing.

Off-Line Editor – A low resolution, usually computer and disk based edit system in which the creative editing decisions can be made at lower cost and often with greater flexibility than in an expensive fully equipped on-line bay.

Offline Encoder – The Indeo video codec's normal mode of operation, in which it takes as long as necessary to encode a video file so that it displays the best image quality and the lowest and most consistent data rate. Compare Quick Compressor.

Offset – a) The horizontal and vertical displacement of a clip. **b)** Reference numbers that indicate the change, in terms of frames, that take place when you trim.

Ohm – The unit of resistance. The electrical resistance between two points of a conductor where a constant difference of potential of 1 V applied between these points produces in the conductor a current of 1 A, the conductor not being the source of any electromotive force.

OIRT (Organisation Internationale de Radiodiffusion-Television) – The OIRT was dissolved in 1992 and integrated into the Union of the European Broadcast Organizations (UER).

OLE (Object Linking and Embedding) – A standard for combining data from different applications that updates automatically.

O-Member (Observing Member) – A term used within ISO/IEC JTC1 committees. A National Body that does not vote.

OMF, OMFI, OMF Interchange (Open Media Framework Interchange) – A media and metadata exchange solution developed by Avid Technology. A standard format for the interchange of digital media data among heterogeneous platforms. The format is designed to encapsulate all the information required to interchange a variety of digital media, such as audio, video, graphics, and still images as well as the rules for combining and presenting the media. The format includes rules for identifying the original sources of the digital media, and it can encapsulate both compressed and uncompressed digital media data.

Omnidirectional – A microphone type that picks up sound relatively evenly from all directions.

OMWF (Open MPEG Windows Forum) – OMWF is a Japanese industry consortium aiming at compatibility in MPEG-based multimedia applications. The group, that includes various hardware and software vendors and content providers in Japan, ahs its offspring in the popularity in Japan of CD movies and Karaoke. Through cooperation with the Open MPEG Consortium in the USA, the OMWF cleared up details in the MCI standard, that impeded compatibility. The new specification, called the Video CD specification, allows Windows machines to play MPEG-1 video CDs and allows Windows data and applications to be stored on the same CD along with the video contents.

On the Fly – a) Depressing a button causing some change while a switcher is transitioning. **b)** Selecting a tape edit point while VTR is moving.

On-Air Output – Ready to use for transmission or videotaping, this is the PGM output.

One Light – A telecine transfer or film print produced with a single setting of color correction values. One light is the simplest, fastest, and least costly type of transfer.

One Wire Interconnect – Interconnect consists of a single wire transporting an encoded, composite analog video signal.

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

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

One's Complement – Number representation system used for signed binary integers in which the negative of a number is obtained by complementing it. The leftmost bit becomes the sign bit, with 0 for plus, 1 for minus.

On-Line Editing – a) Editing that is done to produce a finished program master. **b)** Final editing session, the stage of post-production in which the edited master tape is assembled from the original production footage, usually under the direction of an edit decision list (EDL).

On-Line Editor – An editing system where the actual video master is created. An on-line bay usually consists of an editing computer, video switcher, audio mixer, one or more channels of DVE, character generator, and several video tape machines.

On-Line, Online – Final editing or assembly using master tapes to produce a finished program ready for distribution. Often preceded by off-line editing, but in some cases programs go directly to the on-line editing suite. Usually associated with high-quality computer editing and digital effects.

On-Screen Display – A function on many VCRs and televisions in which operational functions (tint, brightness, VCR function, programming, etc.) are displayed graphically on the television screen.

ONU (Optical Node Unit)

OOB (Out-of-Band) – Out-of-band is any frequency outside the band used for voice frequencies.

Opaque Macroblock – A macroblock with shape mask of all 255's.

Opcode – See Operation Code.

OPCR (Original Program Clock Reference)

Open – To double-click an icon, or to select an icon then choose "Open" from a menu in order to display a window that contains the information that the icon represents.

Open Architecture – A concept for television receivers that acknowledges an absence of ATV transmission/distribution standards and allows a receiver to deal with a multiplicity of standards and delivery mechanisms.

Open MPEG Consortium – The goal of the Open MPEG Consortium is to "create a single API for the playback of MPEG-1 titles under Windows and DOS". The consortium has developed the MPEG Multimedia Control Interface (MCI) which defines how MPEG boards operate under Windows. Due to some undefined topics, the MCI specification has not been able to curb incompatibility, but the consortium has later cooperated with the Japanese OMWF group on an enhanced specification.

Open Subtitles – See Subtitles.

Open-Ended Edit – a) Assemble mode. **b)** Edit that has a start time but no designated stop time.

Open-Loop – Circuit or other system operating without feedback.

Operating Level – A certain level of flux recorded on magnetic tape.

Operating Program – Computer software program which controls all functions of related computers and hardware devices.

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

Operation Code (Opcode) – Segment of the machine-language instruction that specifies the operation to be performed. The other segments specify the data, address, or port. For the 8085, the first byte of each instruction is the opcode.

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

Optical Effects – Trick shots prepared by the use of an optical printer in the laboratory, especially fades and dissolves.

Optical Fiber – A glass strand designed to carry light in a fashion similar to the manner in which wires carry electrical signals. Since light is electromagnetic radiation of tremendously high frequency, optical fibers can carry much more information than can wires, though multiple paths through the fiber place an upper limit on transmission over long distances due to a characteristic called pulse dispersion. Many feel that the wide bandwidth of an optical fiber eliminates the transmission problems associated with the high base bandwidth of HDEP schemes. CATV and telephone companies propose connecting optical fibers directly to homes.

Opticals – The effects created in a film lab through a process called A-roll and B-roll printing. This process involves a specified manipulation of the film negative to create a new negative containing an effect. The most common opticals used in film editing are fades, dissolves, and superimpositions.

Option Button – Used to select from a list of related items. The selected option box has a black dot. (One item in the group must be selected.)

Option Drive – Any internal drive other than the system disk. Option drives include floppy disk drives, secondary hard disk drives, or DAT drives.

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

Orbit – The rotation of the camera eye around the point of interest.

Orientation – a) For animation, many 3D systems fix the viewer's location at a specified distance from the viewing screen. Currently, PictureMaker is one of these. In such systems, the database is moved relative to the viewer. The set of motions that accomplish any particular view of the world is called its "orientation". Using the three coordinate axes as references, we can translate (shuffle on a plane) and rotate objects to create new views. During animation, we change the amounts of these motions. A set of numbers describes orientation: x-trans, y-trans, z-trans, x-rot, y-rot, z-rot. **b)** A direction of presentation affecting resolution requirements. Horizontal lines become vertical lines when their orientation is rotated by 90 degrees; a pattern of dots appearing to be in horizontal and vertical rows may not appear to be diagonally aligned when its orientation is rotated 45 degrees due to characteristics of the human visual system.

Orientation Animation – We can also use splines to calculate orientations for objects in between their orientations at keyframe positions. This allows the motions of an object to be smooth rather than robot-like. In traditional animation, orientation animation required an artist to redraw the object when it rotated out of the plane of the platen (on the animation stand) and path animation was limited to repositioning the cells in X and Y (although the whole scene could be zoomed). In computer graphics, it is easy to rotate and reposition objects anywhere in three dimensions. That is why you see so much of it!

Orientation Direction – The arrangement of magnetic particles on recording tape. In tapes designed for quadraplex recording applications, the orientation direction is transverse. For helical and longitudinal recording, it is longitudinal.

Orientation Ratio – In a material composed of oriented particles, the orientation ratio is the ratio of the residual flux density in the orientation direction to the residual flux density perpendicular to the orientation direction. The orientation ratio of conventional tapes is typically about 1.7.

Origin – A reference point for measuring sections of recorded or digitized sample data. A file mob value for the start position in the media is expressed in relation to the origin. Although the same sample data can be re-recorded or re-digitized, and more sample data might be added, the origin remains the same so that composition source clips referencing it remain valid.

Original Negative – The actual film stock used in the camera to photograph a scene.

original_network_id – A unique identifier of a network.

Origination – The production cycle begins with the introduction of images in photographic, electronic imaging, or computational media. Image capture in real-time is usually essential for recording live subjects and maintaining the impact of realism. Image generation, normally achieved in non real-time, provides additional subject matter that can be edited into and combined with recorded live subjects to achieve programs that are more artistic, or more instructional, or both.

Orthicon (Conventional) – A camera tube in which a low-velocity electron beam scans a photoemissive mosaic on which the image is focused optically and which has electrical storage capability.

Orthicon (Image) – A camera tube in which the optical image falls on a photo-emissive cathode which emits electrons that are focused on a target

at high velocity. The target is canned from the rear by a low-velocity electron beam. Return beam modulation is amplified by an electron multiplier to form an overall light-sensitive device.

Orthicon Effect – One or more of several image orthicon impairments that have been referred to as "Orthicon Effect" as follows: edge effect, meshbeat or Moiré, ghost, halo, burned in image. It is obviously necessary to indicate specifically the effects experienced and, therefore, it is recommended that use of this term be discontinued.

Orthogonal Projection – With orthogonal projection, parallel receding lines do not converge. The process of projecting from 3D to 2D is particularly simple, simply throw away the Z-value of each coordinate.

Orthogonal Sampling – a) Sampling of a line of repetitive video signal in such a way that samples in each line are in the same horizontal position. **b)** Picture sampling arranged in horizontal rows and vertical columns.

Osborne, Joseph – An ATV proponent issued a patent for a data compression transmission scheme for HD signals. The Osborne compression system is said to allow channel-compatible but not receiver-compatible HDTV.

Oscilloscope – An electronic device that can measure the signal changes versus time. A must for any CCTV technician.

OSI (Open Systems Interconnection) – The OSI Reference Model was formally initiated by the International Organization for Standardization (ISO) in March, 1977, in response to the international need for an open set of communications standards. OSI's objectives are: to provide an architectural reference point for developing standardized procedures; to allow inter-networking between networks of the same type; to serve as a common framework for the development of services and protocols consistent with the OSI model; to expedite the offering of interoperable, multi-vendor products and services.

OSI Model – The model is similar in structure to that of SNA. It consists of seven architectural layers: the Physical Layer and Data Link Layer, the Network Layer; the Transport Layer; the Session Layer; the Presentation Layer; the Application Layer.

OSI Model	
Physical and Data Link Layers	Provides the same functions as their SNA counterparts (physical control and data link control layers.
Network Layer	Selects routing services, segments blocks and messages, and provides error detection, recovery, and notification.
Transport Layer	Controls point-to-point information interchange, data packet size determination and transfer, and the connection/disconnection of session entities.
Session Layer	Serves to organize and synchronize the application process dialog between presentation entities, manage the exchange of data (normal and expedited) during the session, and monitor the establishment/release of transport connections as requested by session entities.
Presentation Layer	Responsible for the meaningful display of information to application entities. More specifically, the presentation layer identifies and negotiates the choice of communications transfer syntax and the subsequent data conversion or transformation as required.
Application Layer	Affords the interfacing of application processes to system interconnection facilities to assist with information exchange. The application layer is also responsible for the management of application processes including initialization, maintenance and termination of communications, allocation of costs and resources, prevention of deadlocks, and transmission security.

OTP – See Opposite Track Path.

OUI (Organizational Unique Identifier) – The part of the MAC address that identifies the vendor of the network adapter. The OUI is the first three bytes of the six-byte field and is administered by the IEEE.

OUT Point – The end point of an edit, or a mark on a clip indicating a transition point. Also called a Mark OUT. See also IN Point, Mark IN/OUT.

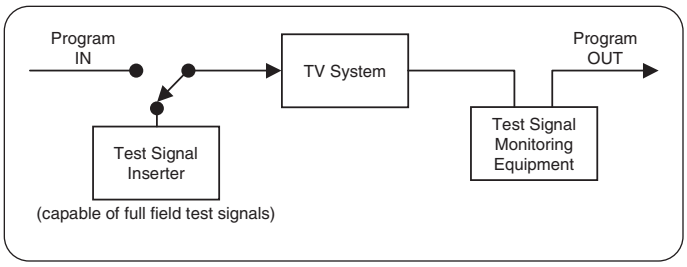
Outer Diameter – Width of the disc. This is 12 cm for "normal" CDs and DVDs, and 8 cm for small CDs and DVDs.

Outlets – Openings in the hardware to which you attach connectors to make an electrical connection.

Outline – A type of key border effect. An outline key with a character generator appears as if the letters have been traced; the background video is visible all around the letter as well as inside it.

Out-of-Band Signaling – A channel that is separate from the data channel carries the signaling.

Out-of-Service (Full Field Testing)



Output – The magnitude of the reproduced signal voltage, usually measured at the output of the reproduce amplifier. The output of an audio or instrumentation tape is normally specified in terms of the maximum output that can be obtained for a given amount of harmonic distortion, and is expressed in dB relative to the output that can be obtained from a reference tape under the same conditions.

Output Format – The form in which video is presented by a video chip to monitoring or recording systems is called the output format. This can be RGB, YUV, YCRCB, etc.

Output Impedance – The impedance a device presents to its load. The impedance measured at the output terminals of a transducer with the load disconnected and all impressed driving forces taken as zero.

Output Port – Circuit that allows the microprocessor system to output signals to other devices.

Out-Take – A take of a scene which is not used for printing or final assembly in editing.

Ovenized Crystal Oscillator – A crystal oscillator that is surrounded by a temperature regulated heater (oven) to maintain a stable frequency in spite of external temperature variations.

Overcoat – A thin layer of clear or dyed gelatin sometimes applied on top of the emulsion surface of a film to act as a filter layer or to protect the emulsion from abrasion during exposure and processing.

Overflow – Results when an arithmetic operation generates a quantity beyond the capacity of the register. An overflow status bit in the flag register is set if an operation causes an overflow.

Overhead Bits – Bits added to the binary message for the purpose of facilitating the transmission and recovery of the message (e.g., frame synchronization words, check bits, etc.)

Overlay – Keyed insertion of one image into another. Overlay is used for example, to superimpose computer generated text on a video image, for titling purposes. In video, the overlay procedure requires synchronized sources for proper operation.

Overlap Edit – An edit in which the audio and video signals are given separate IN points or OUT points, so the edit takes place with one signal preceding the other. This does not affect the audio and video synchronization. See also L-Cut, Delay Edit, or Split Edit.

Oversampled VBI Data – See Raw VBI Data.

Oversampling – Sampling data at a higher rate than normal to obtain more accurate results or to make it easier to sample.

Overscan – a) Increases scanning amplitudes approximately 20%. Used for tube/yoke set-up and sometimes as a precaution against an edge of picture "raster burn". **b)** A video monitor condition in which the raster extends slightly beyond the physical edges of the CRT screen, cutting off the outer edges of the picture.

Overshoot – An excessive response to a unidirectional signal change. Sharp overshoots are sometimes referred to as "spikes".

Overwrite – An edit in which existing video, audio or both is replaced by new material. See also Splice.

Overwrite Edit – The addition of a source clip into a record clip, where the record clip edit sequence does not ripple (the duration does not change). The source clip overwrites an equal number of frames on the edit sequence.

Oxide (Magnetic Oxide) – The magnetizable particle used in the manufacture of magnetic tape.

Oxide Buildup – The accumulation of oxide or, more generally, wear products in the form of deposits on the surface of heads and guides.

Oxide Coating – The magnetic material coated on base film.

Oxide Loading – A measure of the density with which oxide is packed into a coating. It is usually specified in terms of the weight of oxide per unit volume of the coating.

Oxide Shed – The loosening of particles of oxide from the tape coating during use.

▶ P

Pack – A layer in the MPEG system coding syntax for MPEG systems program streams. A pack consists of a pack header followed by zero or more packets. It is a layer in the system coding syntax.

Pack Slip – A lateral slip of select tape windings causing high or low spots (when viewed with tape reel laying flat on one side) in an otherwise smooth tape pack. Pack slip can cause subsequent edge damage when the tape is played, as it will unwind unevenly and may make contact with the tape reel flange.

Packed 24-Bit – A compression method where a graphics accelerator transfers more than one bit on each clock cycle, then reassembles the fragmented pixels. For example, some chips can transfer 8, 24-bit pixels in three clocks instead of the four normally required, saving bandwidth.

Packed Pixel – Color information for a pixel packed into one word of memory data. For a system with few colors, this packed pixel may require only a part of one word of memory; for very elaborate systems, a packed pixel might be several words long. See Planar

Packet – a) A unit of information sent across a (packet-switched) network. A packet generally contains the destination address as well as the data to be sent. **b)** A packet consists of a header followed by a number of contiguous bytes from an elementary data stream. It is a layer in the system coding syntax.

Packet Data – Contiguous bytes of data from an elementary data stream present in the packet.

Packet Identifier (PID) – a) MPEG-2 transmits transport stream data in packets of 188 bytes. At the start of each packet is a packet identifier (PID). Since the MPEG-2 data stream might be in multi-program mode, the receiver has to decide which packets are part of the current channel being watched and pass them onto the video decoder for further processing. Packets that aren't part of the current channel are discarded. Four types of PIDs are typically used by receivers. The VPID is for the video stream and the APID is for the audio stream. Usually reference-timing data is embedded into the video stream, though occasionally a PCR (program clock reference) PID is used to synchronize the video and audio packets. The fourth PID is used for data such as the program guide and information about other frequencies that make up the total package. **b)** A unique integer value used to associate elementary streams of a program in a single- or multi-program transport stream.

Packet Switched Network – Network that transmits data in units called packets. The packets can be routed individually over the best available network connection and reassembled to form a complete message at the destination.

Packet Switching – The method of dividing data into individual packets with identification and address, and sending these packets through a switched network.

Packet Video – The integration of video coding and channel coding to communicate video over a packetized communication channel. Usually these techniques are designed to work in the presence of high packet jitter and packet loss.

Packets – A term used in two contexts: in program streams, a packet is a unit that contains one or more presentation units; in transport streams, a packet is a small, fixed size data quantum.

Packing Density – The amount of digital information recorded along the length of a tape measured in bit per inch (bpi).

Padding – A method to adjust the average length of an audio frame in time to the duration of the corresponding PCM samples, by continuously adding a slot to the audio frame.

Page – Usually a block of 256 addresses. The lower eight bits of an address therefore specify the location within the page, while the upper eight bits specify the page.

Painter's Algorithm – In traditional painting, paint is applied in layers, and the last paint applied is what is visible. Digitally, the last value placed in a pixel determines its color.

Pairing – A partial or complete failure of interlace in which the scanning lines of alternate fields do not fall exactly between one another but tend to fall (in pairs) one on top of the other.

PAL – See Phase Alternate Line.

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.

PAL Format – A color television format having 625 scan lines (rows) of resolution at 25 frames per second (25 Hz). See PAL. Compare NTSC Format.

PALE – See Phase Alternating Line Encoding.

Palette – a) The limited set of colors that a computer can simultaneously display. A typical palette contains 256 unique colors, chosen from over 16 million possible colors. An "optimized palette" refers to a palette whose colors are chosen to best represent the original colors in a particular graphic or series of graphics. **b)** A central location for user-selectable buttons, which you can map to various functions for ease of use. The command palette houses all the user-selectable buttons that allow you to perform a wide range of commands with a single click of the mouse.

Palette Flash – A phenomenon caused by simultaneously displaying more than one bitmap or video that do not share the same palette.

PALplus, PAL+ – PALplus (ITU-R BT.1197) is 16:9 aspect ratio version of PAL, and is compatible with standard (B, D, G, H, I) PAL. Normal (B, D, G, H, I) PAL video signals have 576 active scan lines. If a film is broadcast, usually 432 or fewer active scan lines are used. PALplus uses these unused "black" scan lines for additional picture information. The PALplus decoder mixes it with the visible picture, resulting in a 16:9 picture with the full resolution of 576 active scan lines. Widescreen televisions without the PALplus decoder, and standard (B, D, G, H, I) PAL TVs, show a standard picture with about 432 active scan lines. PALplus is compatible with standard studio equipment. The number of pixels of a PALplus picture is the same as in (B, D, G, H, I) PAL, only the aspect ratio is different.

Pan – Term used for a type of camera movement, to swing from left to right across a scene or vice versa.

Pan and Scan – A method of transferring movies with an aspect ratio of 16:9 to film, tape or disc to be shown on a conventional TV with a 4:3 aspect ratio. Only part of the full image is selected for each scene. Pan and Scan is the opposite of "letterbox" or "widescreen".

Pan and Tilt Head (P/T Head) – A motorized unit permitting vertical and horizontal positioning of a camera and lens combination. Usually 24 V AC motors are used in such P/T heads, but also 110 VAC, i.e., 240 VAC units can be ordered.

Pan Pot – An electrical device which distributes a single signal between two or more channels or speakers.

Pan Tilt Zoom (PTZ) – A device that can be remotely controlled to provide both vertical and horizontal movement for a camera, with zoom.

Pan Unit – A motorized unit permitting horizontal positioning of a camera.

Pan Vector – Horizontal offset in video frame center position.

Panel Memory – See STAR system.

PAP (Password Authentication Protocol) – The most basic access control protocol for logging onto a network. A table of usernames and passwords is stored on a server. When users log on, their usernames and passwords are sent to the server for verification.

Paper Edit – Rough edit decision list made by screening original materials, but without actually performing edits.

Parade – This is a waveform monitor display mode in which the Y and two chrominance components of an analog component video are shown sided by side on the waveform screen.

Parallel Cable – A multi-conductor cable carrying simultaneous transmission of data bits. Analogous to the rows of a marching band passing a review point.

Parallel Component Digital – This is the component signal sampling format specified by

ITU-R BT.601-2 and the interface specified by ITU-R BT.656.

Parallel Composite Digital – This is the composite signal sampling format specified in SMPTE 244M for NTSC. The EBU is working on the PAL standard. The composite signals are sampled at the rate of 4FSC which is 14.4 MHz for NTSC and 17.7 MHz for PAL.

Parallel Data – Transmission of data bits in groups along a collection of wires (called a bus). Analogous to the rows of a marching band passing a review point. A typical parallel bus may accommodate transmission of one 8-, 16-, or 32-bit byte or word at a time.

Parallel Device – Any hardware device that requires a parallel cable connection to communicate with a workstation.

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 HDDR – The recording of multiple PCM data streams which are synchronous to a common clock onto multitrack recorder/reproducers.

Parallel Interface – A PC port which receives or transmits data in byte or word form rather than bit form.

Parallel Port – An outlet on a workstation to which you connect external parallel devices.

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

Parameter – a) A variable which may take one of a large range of values. A variable which can take one of only two values is a flag and not a parameter. **b)** The values shown in X, Y and Z in each menu, so called because they represent the numerical values assigned to each feature of a video picture, size, aspect ratio, etc. Changing these values, shown in the "X, Y and Z" columns, produces ADO's visual effects. **c)** A setting, level, condition or position, i.e., clip level, pattern position, system condition. **d)** Value passed from one routine to another, either in a register or a memory location.

Parametric Audio Decoder – A set of tools for representing and decoding audio (speech) signals coded at bit rates between 2 kbps and 6 kbps.

Parametric Modeling – This method uses algebraic equations (usually polynomials) to define shapes and surfaces. The user can build and modify complex objects by combining and modifying simple algebraic primitive shapes.

Parental Level – A mechanism that allows control over what viewers may see depending on the settings in the DVD player, the parental code on a DVD and the structure of the material on the DVD. This is especially useful for youthful viewers whose parents wish to exercise a degree of control over what their children can watch.

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

Parity – a) An extra bit appended to a character as an accuracy check. For example, if parity is even, the sum of all 1s in the character should be even. **b)** Number of 1s in a word, which may be even or odd. When parity is used, an extra bit is used to force the number of 1s in the word (including the parity bit) to be even (even parity) or odd (odd parity). Parity is one of the simplest error detection techniques and will detect a single-bit failure.

Parity Clock – A self-checking code employing binary digits in which the total number of 1s (or 0s) in each code expression is always even or always odd. A check may be made for even or odd parity as a means of detecting errors in the system.

Parsed Audiovisual Objects – See Syntactic Decoded Audiovisual Objects.

Parsing – Identifying and extracting syntactic entities related to coded representations from the bit stream and mapping them in semantic entities.

Parsing Layer – See Syntactic Decoding Layer.

Parsing Script – The description of the parsing procedure.

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

Partial Transport Stream (TS) – Bitstream derived from an MPEG-2 TS by removing those TS packets that are not relevant to one particular selected program, or a number of selected programs.

Particle Orientation – The process by which acicular particles are rotated so that their longest dimensions tend to lie parallel to one another. Orientation takes place in magnetic tape by a combination of the sheer force applied during the coating process and the application of a magnetic field to the coating while it is still fluid. Particle orientation increases the residual flux density and hence the output of a tape and improves performance in several other ways.

Particle Shape – The particles of gamma ferric oxide used in conventional magnetic tape are acicular, with a dimensional ratio of about 6:1.

Particle Size – The physical dimensions of magnetic particles used in a magnetic tape.

Particles – Refer to such vague objects as clouds, fire, water, sand, or snow that can be rendered using a special program.

Partition – A subdivision of the total capacity of a storage disk that creates two or more virtual disks from a single physical disk. In the case of disk arrays, a partition is a virtual array within the whole array.

PASC (Precision Adaptive Sub-Band Coding) – The PASC is very close to the Layer 1 subset in the MPEG audio specification. The algorithm, which is used in the DCC system from Phillips, provides a 384 kbit/s data stream.

Password – A combination of letters and/or numbers that only the user knows. If you specify a password for your account or if you are assigned a password by the system administrator, you must type it after you type your login name before the system lets you access files and directories.

Past Reference Picture – A past reference picture is a reference picture that occurs at an earlier time than the current picture in display order.

PAT (Program Association Table) – Data appearing in packets having PID code of zero that the MPEG decoder uses to determine which programs exist in a Transport Stream. PAT points to PMT (program map table), which, in turn, points to the video, audio, and data content of each program.

Patch – a) To connect jack A to jack B on a patch bay with a patch cord. **b)** A section of curved, non-planar surface; it can be likened to a rectangular rubber sheet which can be pulled in all directions. **c)** Section of coding inserted into a routine to correct a mistake or alter the routine. It is usually not inserted into the actual sequence of the routine being corrected, but placed somewhere else. A jump to the patch and a return to the routine are then provided.

Patch Panel (or Bay, Board, Rack) – A manual method of routing signals using a panel of recep-tacles for sources and destinations and wire jumpers to interconnect them.

Patching – The routing of audio or video from one channel or track in the sequence to another.

Path Length – The amount of time it takes for a signal to travel through a piece of equipment or a length of cable. Also called propagation delay.

Pathname – The list of directories that leads you from the root (/) directory to a specific file or directory in the file system.

Pathological Signal – Used as a stress test for the SDI domain and contains two parts. The first is an equalizer test producing a sequence of 1 bit high, 19 bits low and the PLL test producing a sequence of 20 bits high, 20 bits low. These sequences are not present throughout the whole active region of the signal but only occur once per field as the scrambler attains the required starting condition. This sequence will be maintained for the full line until it terminates with the EAV sequence.

Pattern (PTN) – In general switcher terms, a pattern is any geometric shape which grows, rotates or pivots and in so doing removes the foreground video while simultaneously revealing the background video. Strictly speaking, a pattern is a fully enclosed shape on the screen. This definition is our internal view, but not consistent with the industry. Typical patterns are rectangles, diamonds and circles.

Pattern Border – A variable-width border that occurs at the edges of a wipe pattern. The border is filled with matte video from the border matte generator.

Pattern Extender – The hardware (and software in AVC) package which expands the standard pattern system to include rotary wipes, and rotating patterns (and matrix wipes in AVC).

Pattern Limit – See Preset Pattern.

Pattern Modification – The process of altering one or more pattern parameters. See Modifier.

Pattern Modifier – An electronic circuit which modifies basic patterns by rotating, moving positionally, adding specular effects to the borders, etc.; thereby increasing the creative possibilities.

Pattern System – The electronic circuitry which generates the various pattern (wipes).

Pause Control – A feature of some tape recorders that makes it possible to stop the movement of tape temporarily without switching the machine from "play" or "record".

Pay TV – A system of television in which scrambled signals are distributed and are unscrambled at the homeowner's set with a decoder that responds upon payment of a fee for each program. Pay TV can also refer to a system where subscribers pay an extra fee for access to a special channel which might offer sports programs, first-run movies or professional training.

Payload – Refers to the bytes which follow the header byte in a packet. For example, the payload of a transport stream packet includes the PES_packet_header and its PES_packet_data_bytes or pointer_field and PSI sections, or private data. A PES_packet_payload, however, consists only of PES_packet_data_bytes. The transport stream packet header and adaptation fields are not payload.

Pay-Per-View (PPV) – A usage-based fee service charged to the subscriber for viewing a requested single television program.

PC (Printed Circuit or Program Counter)

PC2 (Pattern Compatible Code)

PCB (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".

PCI (Peripheral Component Interface) – In 1992, Intel introduced the Peripheral Component interface bus specification. PCI, a high-speed interconnection system that runs at processor speed, became compatible with the VL bus by its second release in 1993. PCI includes a 64-bit data bus and accommodates 32-bit and 64-bit expansion implementations. PCI is designed to be processor-independent and is used in most high-speed multimedia systems. PCI is designed so that all processors, co-processors, and support chips can be linked together without using glue logic and can operate up to 100 MHz, and beyond. PCI specifies connector pinout as well as expansion board architecture.

PCI Bus Mastering – This is the key technology that has allowed under $1000 video capture cards to achieve such high quality levels. With PCI bus mastering you get perfect audio sync and sustained throughput levels over 3 megabits per second.

PCI Slot – Connection slot to a type of expansion bus found in most newer personal computers. Most video capture cards require this type of information.

PCM (Pulse Code Modulation) – Pulsed modulation in which the analog signal is sampled periodically and each sample is quantized and transmitted as a digital binary code.

PCM Disk – A method of recording digital signals on a disk like a standard vinyl record.

PCMCIA (Personal Computer Memory Card International Association) – A standard format for credit-card size expansion cards used to add storage capacity or peripherals such as modems to a computer.

PCR (Program Clock Reference) – a) The sample of the encoder clock count that is sent in the program header to synchronize the decoder clock. **b)** The "clock on the wall" time when the video is multiplexed. **c)** Reference for the 27 MHz clock regeneration. Transmitted at least every 0.1 sec for MPEG-2 and ATSC, and at least every 0.04 sec. for DVB.

PCRI (Interpolated Program Clock Reference) – A PCR estimated from a previous PCR and used to measure jitter.

PCS (Personal Conferencing Specification) – A videoconferencing technology that uses Intel's Indeo compression method. It is endorsed by the Intel-backed Personal Conferencing Working Group (PCWG). Initially competing against H.320, Intel subsequently announced its videoconferencing products will also be H.320 compliant.

PCWG (Personal Conferencing Work Group) – The PCWG is a work group formed by PC and telecom manufacturers to enable interoperable conferencing products. The PCWG released version one of its Personal Conferencing Specification in December 1994. The specification defines a common, interoperable architecture for PC-based conferencing and communications using PC applications and variety of media types. Since then they have announced support for H.320 and T.120 standards.

PCX (PC Exchange Format) – A file format common to most bitmap file format conversions which can be handled by most graphic applications.

PDA (Personal Digital Assistant) - A term for any small mobile hand-held device that provides computing and information storage and retrieval capabilities for personal or business use, often for keeping schedule calendars and address book information handy.

PDH (Plesiochronous Digital Hierarchy)

PDP (Plasma Display Panel) – 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.

PDU – See Protocol Data Unit.

PE – See Phase Error.

Peak Boost – A boost which is greater at the center frequency than either above or below it.

Peak Indicator – An indicator that responds to short transient signals, often used to supplement Recording Level Meters which usually indicate average signal levels.

Peak Magnetizing Field Strength – The positive or negative limiting value of the magnetizing field strength.

Peak Value – The maximum positive or negative instantaneous value of a waveform.

Peak White – The highest point in the video waveform that the video level can reach and still stay within specification.

Peaking Equalization – Equalization which is greater at the center frequency than at either side of center.

Peak-Reading Meter – A type of Recording Level Meter that responds to short transient signals.

Peak-to-Peak (pp) – The amplitude (voltage) difference between the most positive and the most negative excursions (peaks) of an electrical signal.

Pedding – Raising or lowering the camera while the camera remains level. Vertical equivalent of dollying.

Pedestal – The offset used to separate the active video from the blanking level. When a video system uses a pedestal, the black level is above the blanking level by a small amount. When a video system doesn't use a pedestal, the black and blanking levels are the same. (M) NTSC uses a pedestal set at +7.5 IRE, (B, D, G, H, I) PAL does not.

Pedestal Level – This term is obsolete; "blanking level" is preferred.

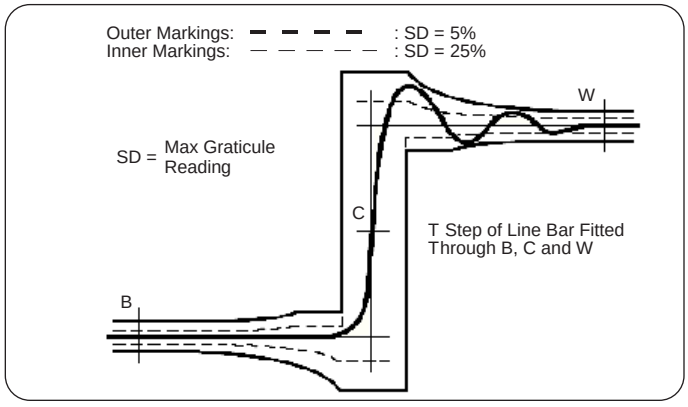
PEG – Public, educational, governmental access channels. Penetration: The number of homes actually served by cable in a given area, expressed as a percentage of homes passed. Premium Services: Individual channels such as HBO and Showtime which are available to cable customers for a monthly subscription fee.

Pel (Picture Element) – See Pixel.

Pel Aspect Ratio – The ratio of the nominal vertical height of pel on the display to its nominal horizontal width.

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

Percent SD – Short time distortion amplitudes are not generally quoted directly as a percent of the transition amplitude but rather are expressed in terms of an amplitude weighting system which yields "percent-SD". This weighting is necessary because the amount of distortion depends not only on the distortion amplitude but also on the time the distortion occurs with respect to the transition. The equation for NTSC Systems is SD = at0.67 where "a" is the lobe amplitude and "t" is the time between transitions and distortions. In practice, screen graticules eliminate the need for calculations. Refer to the figure below. Also see the discussion on Short Time Distortions.



Percentage Sync – The ratio, expressed as a percentage, of the amplitude of the synchronizing signal to the peak-to-peak amplitude of the picture signal between blanking and reference white level.

Perception, Visual – The interpretation of impressions transmitted from the retina to the brain in terms of information about a physical world displayed before the eye. Note: Visual perception involves any one or more of the following: recognition of the presence of something; identifying it; locating it in space; noting its relation to other things; identifying its movement, color, brightness, or form.

Perceptual Audio Coding – Audio compression technique that removed frequencies and harmonics that are outside the range of human hearing.

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

Perceptual Weighting – The technique (and to some extent, art) of taking advantage of the properties of the human auditory or visual system.

Perforations – Regularly spaced and accurately shaped holes which are punched throughout the length of a motion picture film. These holes engage the teeth of various sprockets and pins by which the film is advanced and positioned as it travels through cameras, processing machines and projectors.

Periodic Noise – The signal-to-periodic noise ratio is the ratio in decibels, of the nominal amplitude of the luminance signal (100 IRE units) to the peak-to-peak amplitude of the noise. Different performance objectives are sometimes specified for periodic noise (single frequency) between 1 kHz and the upper limit of the video frequency band and the power supply hum, including low order harmonics.

Peripheral – Any interface (hardware) device connected to a computer that adds more functionality , such as a tape drive. Also, a mass storage or communications device connected to a computer. See also External Devices and Internal Drives.

Perm'ed – Magnetized to a level which cannot be remove with a handheld degausser.

Permanent Elongation – The percentage elongation remaining in a tape or length of base film after a given load, applied for a given time, has been removed and the specimen allowed to hang free, or lightly loaded, for a further period.

Permanent Virtual Circuit (PVC) – A PVC in a network does not have a fixed physical path but is defined in a static manner with static parameters.

Perpendicular Direction – Perpendicular to the plane of the tape.

Persistence Indicator (PI) – Indicates if an object is persistent.

Persistence Objects (PO) – Objects that should be saved at the decoder for use at a later time. The life of a PO is given by an expiration time stamp (ETS). A PO is not available to the decoder after ETS runs out. ETS is given in milliseconds. When a PO is to be used at a later time in a scene, only the corresponding composition information needs to be sent to the AV terminal.

Perspective – The artistic method in a two dimensional plane to achieve a three dimensional look. The technique or process of representing on a plane or curved surface, the spatial relation of objects as they might appear to the eye, one giving a distinct impression of distance.

Perspective (Menu) – The 3D function that enables changing the skew and perspective of an image. **Skew X:** Uses the X axis to slant the image right or left to change the image geometry into a parallelogram. Perspective: Uses the Z axis to change the point of view (perspective) of an image, to give it a three-dimensional appearance.

Perspective Projection – When perspective is used, a vanishing point is used. With perspective, parallel lines receding into the screen appear to converge. To make this happen the process of converting a 3D coordinate (x, y, z) into its 2D perspective on the screen requires dividing the original x and y coordinates by an amount proportional to the original z value. Thus, the larger z is, points on the parallel lines that are far away will be closer together on the screen.

Perturbation – A method to add noise so as to enhance the details of a surface.

PES (Packetized Elementary Stream) – Video and audio data packets and ancillary data of undefined length.

PES Header – Ancillary data for an elementary stream.

PES Packet – The data structure used to carry elementary stream data. It consists of a packet header followed by PES packet payload.

PES Packet Header – The leading fields in a PES packet up to but not including the PES_packet_data_byte fields where the stream is not a padding stream. In the case of a padding stream, the PES packet header is defined as the leading fields in a PES packet up to but no including the padding_byte fields.

PES Stream – A PES stream consists of PES packets, all of whose payloads consist of data from a single elementary stream, and all of which have the same stream_id.

Petabyte – 1000 terabytes, or 1 million gigabytes.

P-Frame (Predicted Frame) – One of the three types of frames used in the coded MPEG-2 signal. The frame in an MPEG sequence created by predicting the difference between the current frame and the previous one. P-frames contain much less data than the I frames and so help toward 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.

PGM – See Program.

Phantom Matrix – That portion of the switcher electronic crosspoints which are not controlled by a row of push buttons on the console. See Bus.

Phantom Points – See Ghost Point.

Phantom Power – Electricity provided by some broadcast and industrial/professional quality audio mixers for use by condenser microphones connected to the audio mixer. Some microphones require phantom power, and must be connected to audio mixers that provide it.

Phase – a) A measure of the time delay between points of the same relative amplitude (e.g., zero crossings) on two separate waveforms. **b)** A stage in a cycle. **c)** The relationship between two periodic signals or processes. **d)** The amount of cycles one wave precedes or follows the cycles of another wave of the same frequency. **e)** A fraction of a wave cycle measured from a fixed point on the wave.

Phase Adjust – The method of adjusting the color in a (M) NTSC video signal. The phase of the chroma information is adjusted relative to the color burst and affects the hue of the picture.

Phase Alternate Line (PAL) – a) European video standard with image format 4:3 aspect ratio, 625 lines, 50 Hz and 4 MHz video bandwidth with a total 8 MHz of video channel width. PAL uses YUV. The Y component represents Luminance. The U component represents B-Y. The V component represents R-Y. The V component of burst is inverted in phase from one line to the next in order to minimize hue errors that may occur in color transmission. **b)** The color television transmission standard used in Europe and other parts of the world. This standard uses a subcarrier which is alternated 90 degrees in phase from one line to the next to minimize hue errors in color transmission. PAL-I uses a 4.43361875 subcarrier. A single frame (picture) in this standard consists of 625 scanning lines. One frame is produced every 1/25 of a second. PAL-M uses a 3.57561149 MHz subcarrier and 525 scanning lines. One frame is produced every 1/30 of a second. **c)** The television and video standard in use in most of Europe. Consists of 625 horizontal lines at a field rate of 50 fields per second. (Two fields equals one complete frame.) Only 576 of these lines are used for picture. The rest are used for sync or extra information such as VITC and Closed Captioning.

Phase Alternating Line Encoding (PALE) – A method of encoding the PCM NTSC signal by reversing the encoding phase on alternate lines to align the code words vertically.

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

Phase Comparator – Circuit used in a phase locked loop to tell how closely the phase locked loop reference signal and the PLL output are in phase with each other. If the two signals are not in phase, the Phase Comparator generates an error signal that adjusts the PLL frequency output so that it is in phase with the reference signal.

Phase Distortion – A picture defect caused by unequal delay (phase shift-ing) of different frequency components within the signal as they pass through different impedance elements – filters, amplifiers, ionosphere variations, etc. The defect in the picture is “fringing”-like diffraction rings at edges where the contrast changes abruptly.

Phase Error – a) A picture defect caused by the incorrect relative timing of a signal in relation to another signal. **b)** A change in the color subcarrier signal which moves its timing out of phase, i.e., it occurs at a different instant from the original signal. Since color information is encoded in a video signal as a relation between the color subcarrier and the color burst phase, a deviation in the color subcarrier phase results in a change in the image’s hue.

Phase Shift – The movement of one signals phase in relation to another signal.

Phase-Locked Loop – The phase locked loop (PLL) is central to the operation of frequency and phase stable circuitry. The function of the PLL is to provide a frequency/phase stable signal that is based on an input reference signal.

Phasing – Adjusting the delay of a video signal to a reference video signal to ensure they are synchronous. This includes horizontal and subcarrier timing. Also called timing.

PHL – Abbreviation for Physical Layer.

Phon – A unit of equal loudness for all audio frequencies. Phons are related to dB, SPL re: 0.0002 microbar by the Fletcher-Munson curves. For example, a loudness level of 40 phons would require 40 dB SPL at 1 kHz and 52 dB at 10 kHz.

Phong – A type of rendering (shadows, environmental reflections, basic transparency, and textures).

Phong Shading – A more realistic and time-consuming type of shading, Phong shading actually calculates specular reflections.

Phono – A connector used in audio and video components, characterized by its single connection post and metal flanges. See also RCA Connector.

Phot – A photometric light unit for very strong illumination levels. One phot is equal to 10,000 luxes.

Photo CD – Kodak's Photo CD for representing 24-bit 4:2:0 YCbCr images hierarchically at resolutions of up to 3072x2048 pixels. Thumbnails image representation is also part of the Photo CD spec. Built upon CD-ROM XA.

Photo Multiplier – A highly light-sensitive device. Advantages are its fast response, good signal-to-noise ratio and wide dynamic range. Disadvantages are fragility (vacuum tube), high voltage and sensitivity to interference.

Photo YCC – A color encoding scheme developed by Kodak for its Image PAC file format.

Photodiode – A type of semiconductor device in which a PN junction diode acts as a photosensor.

Photo-Effect – Also known as photoelectric-effect. This refers to a phenomenon of ejection of electrons from a metal whose surface is exposed to light.

Photoemissive – Emitting or capable of emitting electrons upon exposure to radiation in and near the visible region of the spectrum.

Photon – A representative of the quantum nature of light. It is considered as the smallest unit of light.

Photopic Vision – The range of light intensities, from 105 lux down to nearly 10^-2 lux, detectable by the human eye.

Physical Damage – Any distortion of the magnetic tape which prevents proper head-to-tape contact and is therefore detrimental to the tape playback. These distortions can include edge damage, wrinkles, cinches, and tape stretch.

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

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

PIC – A standard file format for animation files.

Pick-Off Jitter – Jitter is a random aberration in the time period due to noise or time base instability. Pick-off means sample point.

Pick-Up Pattern – The description of the directionality of a microphone. The two prominent microphone pick-up patterns are omnidirectional and unidirectional.

Pickup Tube – An electron-beam tube used in a television camera where an electron current or a charge-density image is formed from an optical image and scanned in a predetermined sequence to provide an electrical signal.

PICT – A standard file format for bit-mapped and object-oriented graphic files.

Picture – a) Source, coded or reconstructed image data. A source or reconstructed picture consists of three rectangular matrices of 8-bit numbers representing the luminance and two chrominance signals. For progressive video, a picture is identical to a frame, while for interlaced video, a picture can refer to a frame, the top field or the bottom field of the frame depending on the context. **b)** In general, the term “picture” covers a coded entity. A picture can either be a frame or a field. It is possible to change dynamically between frame coding and field coding from frame to frame. Frame coding is preferred when a lot of details, but little motion, is present, and field coding is best for fast movements. It is also important to realize that when the coded material originates from film, the two fields cover the exact same time, but when the source material comes from a video camera, the two fields relate to different moments.

Picture Element – The smallest area of a television picture capable of being delineated by an electric signal passed through the system or part thereof. Note: It has three important properties, namely Pv, the vertical height of the picture element; Ph, the horizontal length of the picture element; and Pa, the aspect ratio of the picture element. In an analog system Pv = 1/N, where N is the number of active scanning lines in the raster, Ph = trA/tc, where tr is the average value of the rise and delay times (10% to 90%) of the most rapid transition that can pass through the system or part thereof, tc is the duration of the part of a scanning line that carries picture information, and A is the aspect ratio of the picture.

Picture Height – In a scanning standard, the number of raster lines that contain the vertical extent of a white flatfield between the 50% response points, top and bottom.

Picture Monitor – This refers to a cathode-ray tube and its associated circuits, arranged to view a television picture.

Picture Rate – The nominal rate at which pictures should be output from the video decoding process or input from the source.

Picture Safety Area – The area of a video signal which will be visible on a receiving monitor. Often denoted by marks within the viewfinder of the video camera.

Picture Sharpness – The fine details in a video picture. A picture appears sharp when it contains fine details and has good contrast. Picture sharpness is easily lost during the recording/playback process. Advanced video enhancement equipment is used to improve picture sharpness, especially contrast, and can precompensate for potential losses which might alter an image during processing.

Picture Signal – That portion of the composite video signal which lies above the blanking level and contains the picture information.

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

Picture Tube – A cathode-ray tube used to produce an image by variation of the intensity of a scanning beam.

Picture Width – In a scanning standard, that fraction of a total raster line that contains the horizontal extent of a white flatfield between the 50% response points, left and right.

PID (Packet Identifier) – A 13-bit code in the transport packet header. PID 0 indicates that the packet contains a PAT PID. PID 1 indicates a packet that contains CAT. The PID 8191 indicates null (stuffing) packets. All packets belonging to the same elementary stream have the same PID.

Piezoelectric Microphone – A microphone whose generating element is a crystal or ceramic element, which generates a voltage when bent or stressed by movement of the diaphragm.

Pigeons – Noise observed on picture monitors as pulses or bursts of short duration, at a slow rate of occurrence; a type of impulse noise.

Pinchroller – A rubber or neoprene wheel which presses the tape against the capstan during recording or play.

Pinhole Lens – A fixed focal length lens, for viewing through a very small aperture, used in discrete surveillance situations. The lens normally has no focusing control but offers a choice of iris functions.

Pink Noise – a) Random noise which has equal energy per octave throughout the audio spectrum. **b)** A type of noise whose amplitude is inversely proportional to frequency over a specified range. Pink noise is characterized by a flat amplitude response per octave band of frequency (or any constant percentage bandwidth), i.e., it has equal energy, or constant power, per octave. Pink noise can be created by passing white noise through a filter having a 3 dB/octave slope.

PIP (Picture In Picture) – A digital special effect in which one video image is inserted within another allowing several images to share a single screen.

Pipe – A way of stringing two or more programs together so that the output of one is fed to the other as input.

Pipeline – A stage in a processor which executes a partial task. For example, a memory pipeline might use pipelined (sequential) stages to calculate the address, read the value of the memory cell, store the value in a register. A pipeline allows starting the execution of a cycle before a previous cycle has been completed. A processor can start to execute a complex instruction in a pipeline before the preceding instruction has been completed.

Pit – The depressed area of an optical disc.

PIT (Program Information Table)

Pit Art – a) A type of DVD labeling in which the pits are cut in a design to resemble writing or another image. It sometimes has the look of a hologram. **b)** A pattern of pits to be stamped onto a disc to provide visual art rather than data. A cheaper alternative to a printed label.

Pit Length – Arc length of pit along the direction of the track.

Pitch Control – A circuit which permits the speed of a tape transport's motor to be varied slightly to raise and lower the musical pitch of the recording or to slightly lengthen or shorten playing time.

Pixel (Picture Element) – a) Related to a particular image address in digital systems or to the smallest reproducible element in an analog system. A single point on the screen. As an example, if a system is said to have a display resolution of 1280 by 1024, there are 1280 pixels per horizontal line and 1024 horizontal lines from the top of the screen to the bottom. **b)** A pixel is the digital representation of the smallest area of a television picture capable of being delineated by the bit stream; i.e., the digital value or set of values that defines the characteristics of a picture element. A pixel of a full color image is represented by a minimum of three components, reflecting the trichromatic nature of human vision. A pixel of a monochrome image may be represented by a single component. Pixels may carry additional information such as transparency. The total number of picture elements in a complete picture is of interest since this number provides a convenient way of comparing systems. **c)** One of the tiny points of light that make up the picture on a computer screen. The smaller and closer together the pixels are, the higher the resolution.

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

Pixel Clock – a) This clock divides the incoming horizontal line of video into pixels. The pixel clock is very stable relative to the incoming video or the picture will not be stored correctly. The higher the frequency of the pixel clock, the more pixels that will appear across the screen. **b)** 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 Depth – The number of bits of color information per pixel. A system using eight bits per pixel can display 256 (28) colors. A system using 16 bits per pixel can display 65,536 (216) colors. A system using 24 bits per pixel can display over 16.7 million colors. Twenty-four-bit color is often called true color because the human eye can distinguish among approximately six million different colors, or fewer than are available in a 24-bit color system.

Pixel Drop Out – This is a common source of image artifacts that appear as 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 or pixel timing being incorrect any where in the system.

Pixel, Square – a) Picture element with equal vertical and horizontal sample spacing, having an aspect ratio of 1:1. Square pixels are used by computers, and the software expects the use of square pixels for proper operation. Video originally was unconcerned about the aspect ratio of its pixels. Increasing dependence upon electronic post-production has emphasized the advantage of square pixels. **b)** System M/NTSC, by comparison, does not have square pixels. With 485 active vertical lines per frame, and 768 samples per active horizontal line (when sampled at four times subcarrier) in a 4:3 aspect ratio, the resulting pixels have an aspect ratio (width:height) of 0.842. **c)** During image processing, some transforms that manipulate individual pixels as independent picture elements – especially those operations involving any image rotation, distortion, or size changes are performed with simplified programs and less risk of artifacts when the pixels are square.

Pixel, Rectangular – Picture element that has different vertical and horizontal sample spacing. Rectangular pixels are usually used by consumer video equipment and video conferencing.

PJ (Phase Jitter) – Phase Jitter is a short term instability of the amplitude and/or phase of a signal. It is also called Jitter.

Plain Old Telephone System (POTS) – The analog public switched telephone system.

Planar – In display terms, the pixel color information is stored in four bits across four memory planes. This allows a maximum of 16 colors (24). See Packed Pixel.

Planes – A plane is a flat surface, infinitely large.

Playback – The reproduction of sound previously recorded on a tape.

Playback Demagnetization – A loss of magnetization and thus a degradation of recorded information caused by repeated playing of a recorded tape.

Playback Head – A transducer which converts magnetic flux into electrical current.

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

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

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).

PLL – See Phase Locked Loop.

PLUGE (Picture Line-Up Generating Equipment) – The PLUGE signal was designed for rapid and accurate adjustment of the black level, reference and, hence, the luminance range, display. It provides adjacent vertical bars, one at black level, reference and continuous bars slightly above and slightly below that reference. Following initial development by the BBC, CCIR now recognizes at least eight versions. SMPTE EG 1-1990 includes a variant in which the black level, reference is flanked by bars at –4 IRE and +4 IRE. When the –4 IRE merges into the black level, reference bar, but the +4 IRE bar is distinguishable, black level, reference is correctly set. A white patch is included at peak white, to define IRE 100, and the luminance range, display CRT.

Plug-Ins – Software programs that can install into a main nonlinear editing software to give you additional features and/or specs.

Plumbicon – Thermionic vacuum tube developed by Philips, using a lead oxide photoconductive layer. It represented the ultimate imaging device until the introduction of CCD chips.

PLV (Production Level Video) – A digital video algorithm developed by Intel in 1989 which can produce VHS-quality video at 30 frames per second at 256 x 240 pixels. Horizontal line doubling is used to produce a VGA 640 x 480 pixels.

P-Member (Primary Member) – A term used within ISO/IEC JTC1 committees. A National Body that can vote.

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

PMT (Program Map Table) – Used to identify the locations of the streams that make up each service and the location of the PCR fields for a service. This table is transmitted in sections. Name of programs, copyright, reference of the state streams with PIDs etc. belonging to the relevant program.

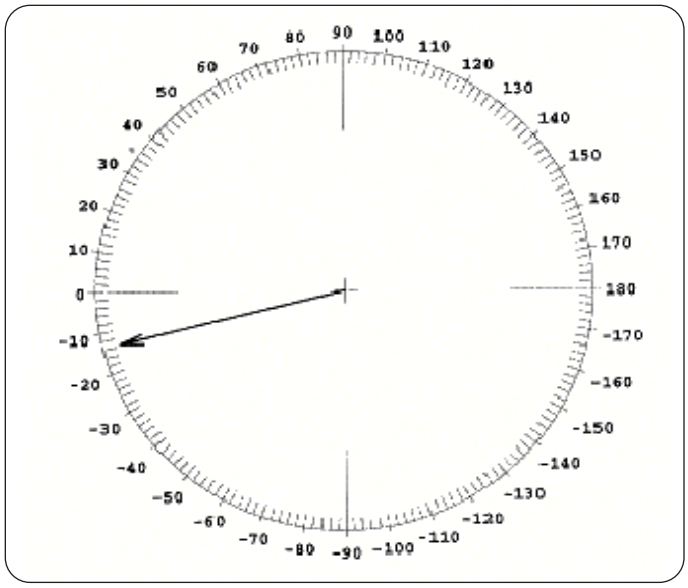
Point Source – Light that emanates from a given point with equal intensity in all directions with a maximum intensity at its position. It exponentially dies out to zero at the distance of its radius. This is called the sphere light source.

Points – Points are locations in 3D space. They are represented in the computer as numerical triplets (x, y, z) where x, y and z measure the point's distance from the origin. A point is also called a vertex (plural is vertices). Objects are defined in terms of points. Vertex is a synonym for point. A point's x, y and Z values are called its coordinates.

Points of Interest – The portion or area of a scene on which the camera focuses.

Point-to-Point – A communication link or transmission between only two terminals.

Polar SCH Phase Display – This type of display shows the phase relationship of the color oscillator and the 50% point on the leading edge of the horizontal sync pulse. The phase of these two can be within 0 to 360 degrees of each other. In this example, there is a 12 degree phase difference between the two.



Polarity of Picture Signal – Refers to the polarity of the black portion of the picture signal with respect to the white portion of the picture signal. For example, in a "black negative" picture, the potential corresponding to the black areas of the picture is negative with respect to the potential corresponding to the white areas of the picture, while in a "black positive" picture the potential corresponding to the black areas of the picture is positive. The signal as observed at broadcasters' master control rooms and telephone company television operating centers is "black negative".

Polarizing Filter – An optical filter that transmits light in only one direction (perpendicular to the light path), out of 360° possible. The effect is such that it can eliminate some unwanted bright areas or reflections, such as when looking through a glass window. In photography, polarizing filters are used very often to darken a blue sky.

Pole Pieces – The metal pieces of a head through which magnetic flux passes to or from the gap.

Polling – One method used to identify the source of an interrupt request. The CPU must poll (read) the devices to determine which one caused the interrupt.

Polyester – An abbreviation for polyethylene terephthalate, the material most commonly used as a base film for precision magnetic tape. The chief advantages of polyester over other base film materials lie in its humidity and time stability, its solvent resistance and its mechanical strength.

Polygon – A polygon is an enclosed piece of a plane, bounded by vectors.

Polygon Plane – The plane containing the polygon which defines its shape.

Polyphase Filterbank – Set of equal bandwidth filters with special phase interrelationships. It allows for efficient implementations of filterbanks.

Pop – Operation of reading a word from the stack. Same as Pull.

POP (Picture Outside Picture) – A feature of some widescreen displays that uses the unused area around a 4:3 picture to show additional pictures.

Pop Filter – See Blast Filter.

Popped Strand – A strand of tape protruding from the edge of a wound tape pack.

Pop-Up Monitor – An ancillary monitor used to view and mark clips and sequences.

Port – An outlet to which you attach cable connectors. Point at which the I/O devices are connected to the computer.

Position Bar – The horizontal rectangular area beneath the source monitor, record monitor, playback monitor, composer monitor and source pop-up monitor that contains the position indicator.

Position Indicator – A vertical blue line that moves in the position bar and in the timeline to indicate the location of the frame displayed in the monitor.

Position Words – This term is a purely Cubicomp buzzword. As used within their software and documentation, a position word is the set of numbers that orient a single keyframe. Each keyframe gets a position word, and a position word stores the translations, rotations, and zooms that were used to create the view of the world seen in the keyframe. Position words do triple duty: They define the current view of the world. A position word is made up of nine numbers: x, y and Z rotation; x, y and z translation; x and y offsets; and scale; They define keyframes (since a keyframe is a particular view of the world; Similarly, in-betweens are automatically generated views of the world that are in between keyframes.

Positioner – a) The console device which allows an operator to move a pattern around the screen. The AVC has a rate positioner as opposed to an absolute positioner. The direction of pattern movement is the same as the direction in which the positioner is moved and the rate of pattern movement is proportional to the distance the positioner is moved from center. When it is released the pattern stops in its current position and the positioner returns to center. The 4100 has an absolute positioner whose angle and direction correspond to the location of the pattern on the screen. **b)** A joystick control that allows the origin of a wipe pattern to be moved within the active picture area.

Positive Logic – True level is the more positive voltage level in the system.

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

Posterization – a) Special effect in which the picture is reduced to a small number of colors or luminance levels removing any fine gradations of color and brightness resulting in an oil painting effect. Both the Video Equalizer and Digital Video Mixer includes this effect. **b)** An ADO special effect where a frame of video is broken down into flat areas of color. This mimics the silk screen printing method used by graphic designers to create poster designs, hence the derivations of the name.

Posterization – An effect that reduces the various luminance levels of an image so that it looks flat or two-dimensional, somewhat like a poster or paint-by-number picture.

Post-Production – a) All production work done after the raw video footage and audio elements have been captured. Editing, titling, special effects insertion, image enhancement, audio mixing and other production work is done during post-production. Videonics equipment is ideally suited for use in post-production. **b)** The application of image processing to photographic or electronic recorded image information. Usually in addition to scene selection and simple scene transitions, rather complex processing may be proposed: montage of two or more images; integration of photographic and electronic image information; fitting and over-recording; changes of size, contrast, hue, or luminance; introduction of computer-generated components; simulated motion; creation of multi-layered composites with control of transparency. Audio information, maintained in synchronism with the images as specified by the script, is processed along with the image information.

Post-Production, Electronic – Performing one or more of the steps in the post-production sequence with the image information encoded in the electronic mode. The initial and final records, as well as any of the intermediates, may employ the photographic and electronic modes in any combination or permutation.

Post-Production, Off-Line – a) Electronic: Complex post-production may require such large image bandwidths, such storage requirements, and such extensive calculations, that it necessitates conduction in non-real-time, off-line. **b)** Photographic: Traditionally all photographic post-production has been off-line.

Post-Production, Studio – When the studio and distribution standard are identical, and/or program urgency is great, simplified post-production is frequently conducted with all program segment decisions made in real-time review. For such applications, the program is usually in distribution or emission/transmission format.

Post-Roll – a) The number of frames (or seconds and frames) that roll after the edit out-point. **b)** A preset period of time during a preview when a clip will continue to play past the OUT point before stopping or rewinding.

PostScript – A computer language designed to control exactly how and where printed elements (lines, type, graphics) will appear on the page.

Pot (Potentiometer) – Gain control in audio or video.

POTS (Plain Old Telephone Service) – The telephone service in common use throughout the world today. Also known as PSTN.

Power Cable – The cable that connects the workstation to an electrical outlet.

Power Down – To turn off the power switches on the workstation chassis and the monitor.

Power Supply – The piece of hardware within the chassis that directs power from an electrical outlet to the chassis, the monitor, and other internal devices.

Power Up – To turn on the power switches on the workstation chassis and the monitor.

Power!Video – This is an intra-frame video compression algorithm from Horizons Technology, Inc., dedicated to desktop computers, and providing playback without additional hardware. The Power!Video Pro version provides additional controls and settings.

Power-On Diagnostics – A series of tests that automatically check hardware components of a system each time it is turned on.

Power-Up Reset – Initialization process whereby storage elements within a system are preset to defined conditions when power is first applied.

PP – See Peak to Peak.

PPI (PDH Physical Interface)

P-Picture (Predictive-Coded Picture) – One of the three types of digital pictures in an MPEG data stream. A picture that is coded using motion compensated prediction from past reference pictures. The motion compensation is causal, that is, only based on preceding pictures, which can be I-pictures or P-pictures. This type of picture generally has more data than B-picture types.

PPP (Point-to-Point Protocol) – The most popular method for transporting IP packets over a serial link between the user and the ISP. Developed in 1994 by the IETF and superseding the SLIP protocol, PPP establishes the session between the user's computer and the ISP using its own Link Control Protocol (LCP). PPP supports PAP, CHAP and other authentication protocols as well as compression and encryption.

PPS (Pulse Per Second) – The basic repetition rate chosen as the common time reference for all instrumentation (usually 1 pulse per second (pps)).

PPT (PDH Path Termination)

PPV – See Pay-Per-View.

PQ Information – Information on the disc (or tape) that determines track start points, control bits, timing information, etc.

PRBS – See Pseudo Random Binary Sequence.

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

Precomputed Media – A computed effect stored in a file and referenced by a composition or sequence. Applications can precompute effects that they cannot create during playback.

Predicted Pictures (P-Pictures or P-Frames) – Pictures that are coded with respect to the nearest previous I- or P-picture. This technique is termed forward prediction. P-pictures provide more compression than I-pictures and serve as a reference for future P-pictures or B-pictures. P-pictures can propagate coding errors when P-pictures (or B-pictures) are predicted from prior P-pictures where the prediction is flawed.

Prediction – a) The use of a predictor to provide an estimate of the pel/sample value or data element currently being decoded. **b)** Prediction of a picture (P or B) with indication of a motion vector.

Prediction Error – The difference between the actual value of a pel/sample or data element and its predictor.

Predictive Coding – Estimation of the sample currently being decoded from other previous (or future) samples.

Predictive-Coded Picture – A picture that is coded using motion compensated prediction from past reference pictures.

Predictor – A linear combination of previously decoded pel/sample values or data elements.

Preemphasis (Predistortion) – A change in level of some frequency components of the signal with respect to the other frequency components at the input to a transmission system. The high frequency portion of the band is usually transmitted at a higher level than the low frequency portion of the band.

Preenhancement – In many situations, video losses can be anticipated, allowing signal precompensation in a way that partially corrects for the losses. See Line Compensation.

Prelay – The phase of audio post-production during which music, sound effects, dialog replacement and announce tracks are added to the master multitrack before the final mix.

Premastering – The process of formatting data into the exact form that will appear on a DVD, including file structure and file locations. A premastered product is ready to be mastered and replicated.

Preprocessing – The video signal processing that occurs before MPEG encoding. Noise reduction, downsampling, cut-edit identification, and 3:2 pull-down identification are examples of preprocessing.

Pre-Production – The universe of tasks that must be completed before shooting begins.

Pre-Read – See Read Before Write.

Prerecorded Tape – A commercially available recorded tape.

Pre-Roll – a) The number of frames (or seconds and frames) between the cue point and the edit point which allows ACE to synchronize transports prior to an edit. **b)** The process of rewinding videotapes to a predetermined cue point (for example, six seconds) so the tapes are stabilized and up to speed when they reach the selected edit point (during recording or digitizing of source material from a video deck).

Presence – How near the sound source seems to be with respect to the listener. Related to the intensity of the frequencies in the 2.5 K to 7.5 kHz range.

Present Pattern – a) An effect selected by the PST PTN push-button where a wipe pattern is used. The characteristics of the pattern are set using the pattern controls. If the effect is wiped on air over an existing on-air background, the wipe pattern will only move as far as the limit set by the vertical and horizontal limit controls. This is sometimes called a preset wipe or a wipe to a pattern limit. If the effect is mixed on-air, it is called a mix to a pattern limit. **b)** The ability to set both horizontal and vertical limits to the size a pattern will grow to when the fader is moved to the B bus. Ampex switchers can wipe to a preset size, mix in a pattern already at a preset size, and mix or wipe in keys with preset limits. Mixing in a key using preset patterns allows portions of the key to be masked off, and this is the mask key feature on Ampex switchers.

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

Presentation Data – Information, such as video or audio samples, which are presented at a specified time.

Presentation Layer – This MPEG-4 terminal layer encompasses the rendering layer and user interaction.

Presentation Time Stamp (PTS) – a) A field that may be present in a PES packet header that indicates the time that a presentation unit is presented in the system target decoder. **b)** An information unit whose semantic is the time at which the information should begin to be presented.

Presentation Unit (PU) – A decoded audio access unit or a decoded picture.

Preset Background Bus – A row of crosspoint push-buttons used to select the video input that will be placed on-air during the next DSM background transition.

Preset Bus – The line of push button switches on the control panel which select and indicate the next video that will appear when the DSK fader is pulled (AVC series in flip or flip-flop mode only). The idea behind the name is that this is a bus that allows one to pre-select (or preset) the next video.

Preset Positioning – A function of a pan and tilt unit, including the zoom lens, where a number of certain viewing positions can be stored in the system's memory (usually this is in the PTZ site driver) and recalled when required, either upon an alarm trigger, programmed or manual recall.

Preset Wipe – See Preset Pattern.

Preset/Key Bus – The line of push button switches on the control panel which select and indicate the preview output, and represents the next video that will appear when the DSK fader is pulled. It can also select and indicate key sources to other keyers due to the fact that it is a "split" bus. That is, reentries can be selected for the next video as well as bus inputs for a key source, both at the same time. This type of bus is exclusive to 4100 series switchers.

Pressure Pad – A device that forces tape into intimate contact with the head gap, usually by direct pressure at the head assembly.

Pressure Zone Microphone (PZM) – A microphone consisting of a metal plate and a small microphone element. The PZM collects and processes all sound waves that strike the metal plate.

Preview – To rehearse an edit without actually performing (recording) edits.

Preview Bus – A processor function allowing the operator to select any incoming video source for viewing prior to actual use. Typically, each signal can be previewed on its own monitor. This is an effective method to check work before going "on the air". The Digital Video Mixer includes a separate preview output which can be used to preview all four of its video input signals on-screen simultaneously.

Preview Code – An additional reference numbering system, like key numbers, supported by film composer for comparing digital sequences with evolving work print versions using change lists.

Preview Key – The ability to see how a key will appear, and the effect of all adjustments on that key, without having to put the key "on-air".

Preview Monitor – A video monitor which displays the picture from a video source. It is used to evaluate a video source before selecting it.

Preview Output – The output of the switcher which allows you to observe an effect before it is placed on-air. Also called Look Ahead Preview. This includes previewing keys.

Primary Color Correction – Color correction that applies to every part of a video image, or to every part of a video image that falls within a defined luminance range. See also Secondary Color Correction.

Primary Colors – Colors, usually three, that are combined to produce the full range of other colors within the limits of a system. All non-primary colors are mixtures of two or more of the primary colors. In television, the primary colors are specific sets of red, green and blue.

Primary Distribution – The links that feed the signals to the transmission sites, such as terrestrial transmitters, cable head-ends and satellite up-links, from the studio or "Play-Out Center", often via a switching center.

Primary Inputs – The eight video inputs applied to the Key, Program Background, and Preset Background buses.

Primary Matrix – That portion of the crosspoint electronics associated with bus rows accessible from the switcher console. That is, the rows of buttons on the left side of a switcher which select the video inputs to the M/Es and including the program, preset (or line A/B) and PST/key bus row push buttons.

Primary Rate – Primary rate (PRI) operates at 1.544 Mbps and consists of twenty-three 64 kbps B-channels and one 64 kbps D-channel. It is the ISDN equivalent of T1.

Primitives – Refer to the most basic three-dimensional shapes, for example cubes, cylinders, cones, and spheres. From these you can build more complex 3D objects.

Principal Point – One of the two points that each lens has along the optical axis. The principal point closer to the imaging device (CCD chip in our case) is used as a reference point when measuring the focal length of a lens.

Print – A positive copy of the film negative produced in the laboratory. See also Answer Print, Release Print, Work Print.

Print Manager – A tool accessed through either the System Toolchest or the System Manager that is used to set up printer software and monitor jobs that are sent to the printer.

Print-Thru – The effect of signals being magnetically impressed on adjacent portions of tape. This is the effect of magnetic induction and its cause can be excessive spooling or heat. Factors affecting spurious sprinting are principally heat, tape thickness and recording level and, to a lesser extent, time. Print-thru increases linearly with the logarithm of the time of contact, other factors being constant.

Print-to-Tape – Outputting a digital video file for recording onto a videotape.

Print-to-Video – A feature of Adobe Premiere 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. Some capture cards do not support print-to-video.

Priority – Number assigned to an event or device that determines the order in which it will receive service if more than one request is made simultaneously.

Proc Amp – See Video Processing Amplifier.

Process Objects – A subclass of MPEG-4 objects that models processing operations (like decoding process, linear transformation, prediction, filtering) that can be applied on other MPEG-4 objects. These objects have an apply method taking parameters like AV objects or stream objects. They define processing operations used to modify other MPEG-4 objects.

Process Shot – A shot photographed specifically to be part of a special effects composite.

Processed External Key – Synonym for Isolated Key.

Processing Amplifier (or Proc Amp) – A set of electronic circuitry used to insure that the video output signal of a switcher (or other video equipment) maintains proper levels and relationships and that sync and burst are clean and useable. The AVC series switcher comes with a limited proc amp as a standard feature. This proc amp can pass the video signal as it appears at the input, or strip the old sync and add a new sync pulse. It can also strip both sync and burst and add new sync and burst prior to the output of the switcher.

Processor – Same as Microprocessor.

Production – Creation of recorded image information with associated audio, including necessary editing to achieve the thematic and artistic content desired for distribution. Production includes the three subdivisions: origination; post-production, and distribution. During production, there may be one or more interconversions of the image information between photographic and electronic modes. At the conclusion of the production step, the program has its intended final artistic and thematic content. When the major portion of the production process has been completed and the program is transferred to distribution, it may be required to transform, systems to whatever formats best meet the program's distribution requirements.

Production Switcher – A device that allows transitions between different video pictures. Also allows keying and matting (compositing). See Video Switcher.

Production System HDTV – Production system HDTV is the analog of studio standard, HDTV, and addresses only a small part of what the SMPTE Committee on Hybrid Technology (H19) considers production, and in fact only a small part of what they consider electronic production. Thus, in the context of SMPTE 240M, Television Signal Parameters 1125/60 High-Definition Production System, production has a much more restrictive definition that that employed by CCIR, or the SMPTE Committee on Hybrid Technology (H19).To illustrate by example from SMPTE 240M, the scope explains, this standard defines the basic characteristics of the video signals associated with origination equipment operating at the 1125/60 high-definition television production system. It is, therefore, directed to the equipment that first encodes the image information into this electronic format, for example, the studio camera and its associated electronics.

Production, Electronic – Performing one or more of the steps in the production sequence with the image information encoded in the electronic mode.

Production, Electronic, Digital – The SMPTE Working Group on Digital Picture (H19.16) with initial focus upon non real-time digital representation of images, has been formed to develop standards and recommended practices with emphasis upon the production process. The SMPTE Task Force on Digital Image Architecture (ST13.20) has been formed to define further requirements for the exchange of digital pictures at various resolutions and across the interfaces with a variety of video, computer, and data media.

Profile – a) A defined subset of the syntax of a specification. **b)** Subdivision of video coding into different resolutions. **c)** Defines the amount of functions and compression processes involved. It is in other words a defined subset of the entire syntax, and limits the number of facilities, that may be used. For instance, a profile specifies the allowed scalability features.

Program (PGM) – a) Procedure for solving a problem, coded into a form suitable for use by a computer. Frequently referred to as software. **b)** A collection of program elements. Program elements may be elementary streams. Program elements need not have any defined time base; those that do have a common time base and are intended for synchronized presentation. **c)** A concatenation of one or more events under the control of a broadcaster, e.g., news show, entertainment show.

Program Access – Prohibition on exclusive programming contracts between cable operators and program services controlled by cable operators, designed to give alternative multichannel distributors (such as wireless cable and DBS) the opportunity to bid for established cable services (such as CNN or Nickelodeon). The rule expired in 2002.

Program Background Bus – A row of crosspoint push-buttons used to select the on-air background output of the switcher.

Program Bus – a) Similar to the preview bus in concept except that the resulting output is the final signal which goes "on the air". **b)** The line of push button switches on the control panel which select and indicate the video source of the switcher output on a flip or flip-flop style switcher.

Program Chain (PGC) – In DVD-Video, a collection of programs, or groups of cells, linked together to create a sequential presentation.

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

Program Clock Reference (PCR) – A time stamp in the transport stream from which decoder timing is derived.

Program Counter (PC) – Register in the CPU that holds the address of the next program word to be read. Branching requires loading of the jump address into the program counter. Otherwise, the PC is incremented after each word is read.

Program Delivery Control – Information sent during the vertical blanking interval using teletext to control VCRs in Europe.

Program Element – A generic term for one of the elementary streams or other data streams that may be included in the program.

Program Monitor – The window in the Above Premiere interface that displays the edited program.

Program Nonduplication – Under FCC rules, a cable system must black-out the programming of a distant television station it carries, when the system would duplicate a local station's programming, on the request of the local station.

Program Output – The on-air or final output of the switcher as selected on the program or line A/B bus and as keyed, mixed, or faded with the DSK.

Program Side – In color correction, the second of two available levels of color adjustment. Corrections made on the program side typically apply a final look to a finished sequence, for example, by fine-tuning the color values to enhance the mood of a dramatic program. See also Source side.

Program Specific Information (PSI) – Normative data which is necessary for the demultiplexing of transport streams and the successful regeneration of programs.

Program Stream – a) A bit stream containing compressed video, audio, and timing information. **b)** Multiplex of several audio and video PES using the same clock. **c)** Combines one or more packetized elementary streams (PES), which have a common time base into a single stream. The program stream was designed for use in relatively error-free environments, and is suitable for applications which may involve software processing. Program stream packets may be of variable length.

Programming Language – A means of specifying an ordered group of instructions that a computer will execute.

Progressive – a) Short for progressive scanning. A system of video scanning whereby lines of a picture are transmitted consecutively, such as in the computer world. **b)** The property of film frames where all samples of a frame represent the same instances in time.

Progressive Media – Media composed of single frames, each of which is vertically scanned as one pass.

Progressive Picture – Represents sequential scanning of all the lines in the picture. Also called Noninterlaced Picture.

Progressive Scan – See Noninterlaced Scan.

Progressive Sequence – Sequence of pictures, that all are frame pictures with frame DCT coding.

Project – A data device used to organize the work done on a program or series of programs. Bins, rundowns and settings are organized in the project window. The project bins contain all your clips, sequences, effects and media file pointers.

Project Preset – A predetermined list of settings for a project. Certified capture cards usually include presets that work with Adobe Premiere.

Project Settings – All the items needed for Adobe Premiere to work properly with video and audio clips.

Projection – When a database is visualized, it is "projected" from 3D into 2D (the screen). Two kinds of projection are used, projection and orthogonal.

PROM (Programmable Read-Only Memory) – Integrated circuit memory that is manufactured with a pattern of all logical 0s and 1s and has a specified pattern written into it by a special hardware programmer.

PROM Monitor – The interface used to communicate with the system after it is powered up, but before it is booted up and running IRIX.

Prompt – A character or word that the system displays that indicates the system is ready to accept commands.

Propagation Delay – The time it takes for a signal to travel through a circuit, piece of equipment, or a length of cable. When the luminance and color information of a video signal are separated for processing, then reunited at the output of a device, it is critical that the propagation delay for each signal component is equal or distortion similar to ghosting will result. Propagation delay is most noticeable in color-under VHS players. Propagation delay is also a problem when routing computer data and clock signals around a chip or circuit board. The faster the clock, the more critical the path delays.

Proshare – A video conferencing video system by Intel which adapts PCs using added circuit boards, to video conferencing. The Proshare system is based on H.320 recommendations for audio and video teleconferencing.

Protection Layer (PL) – A logical sub-layer of the TransMux Layer to adapt FlexMux stream data for insertion into TransMux-PDUs. One Protection Layer provides for tools such as error protection tools and error detection tools, automatic retransmission tools and framing tools.

Protection Layer Entity (PL Entity) – An instance of the MPEG-4 systems resource that processes PL-PDUs associated to a single TransMux channel.

Protection Layer Protocol Data Unit (PL-PDU) – The smallest protocol unit exchanges between peer PL entities. It consists of PL-PDU header and PL-PDU payload. PL-PDUs with data from one or more FlexMux streams form the payload of TransMux-PDUs.

Protection Layer Protocol Data Unit Header (PL-PDU Header) – Optional information preceding the PL-PDU payload. It is used for error detection, error correction, framing of the PL-PDUs payload. The format of the PL-PDU header is determined when opening the associated TransMux channel.

Protection Layer Protocol Data Unit Payload (PL-PDU Payload) – The data field of the PL-PDU.

Protection Layer Service Data Unit (PL-SDU) – A logical information unit whose integrity is preserved in transfer from one Protection Layer user to the peer Protection Layer user.

Protection Layer User (PL User) – An MPEG-4 systems entity that makes use of the services of the Protection Layer, typically a FlexMux entity.

Protection Master – A copy (dub) of a master tape, usually made immediately after the master has been recorded. It is used as a backup if the master is damaged.

Protective Master – A master positive from which a dupe negative can be made if the original is damaged.

Protocol – a) Set of syntax rules defining exchange of data including items such as timing, format, sequencing, error checking, etc. **b)** A specific set of rules, procedures or conventions relating to format and timing of data transmission between two devices. A standard procedure that two data devices must accept and use to be able to understand each other. The protocols for data communications cover such things as framing, error handling, transparency and line control.

Protocol Data Unit (PDU) – A unit of information exchanged between peer Protocol Layer entities.

Provider – A software layer that provides services to other layers. A provider may or may not involve dedicated hardware.

Proxy – A scaled-down version of an image used to display clips. It includes controls that mimic a VTR.

PS – See Program Stream.

PSA (Public Service Announcement)

Pseudo-Color – A color relationship scheme in which a color table contains available color values, and an index into this table is used to refer to a color. If a desired color is not found in the table, it may be matched to the closest available entry or an existing entry may be overwritten.

Pseudo-Instruction – Instruction that is used in an assembly language program but is an instruction for the assembler. Pseudo-instructions have no direct correspondence to machine language.

Pseudo-Random Binary Sequence (PRBS) – A random sequence of bits which repeat after 2n -1.

Pseudo-Random Sequences/Patterns – Certain systems described in these standards employ feedback shift registers to modify sequences or patterns of bits in a predetermined manner or to restore such modified bit patterns to their original sequence. With outputs of suitably selected stages added modulo-2 and applied to its feedback loop, an n-stage feedback shift register will generate a bit sequence or pattern (2n-1) bits long before repeating. Because such repeating sequences exhibit many of the statistical properties of uniformly distributed random number sequences (e.g., their probability density and autocorrelation functions satisfy appropriate conditions),they are called pseudo-random.

PSI (Program Specific Information) – a) Information that keeps track of the different programs in an MPEG transport stream and in the elementary streams in each program. PSI includes: PAT, PMT, NIT, CAT, ECM, and EMM. **b)** Normative data necessary for the demultiplexing of transport streams and the regeneration of programs.

PSI/SI – A general term for combined MPEG PSI and DVB-SI.

PSIP (Program and System Information Protocol) – A part of the ATSC digital television specification that enables a DTV receiver to identify program information from the station and use it to create easy-to-recognize electronic program guides for the viewer at home. The PSIP generator inserts data related to channel selection and electronic program guides into the ATSC MPEG transport stream.

PSK (Phase Shift Keying) – Phase shift keying (PSK) is a method of transmitting and receiving digital signals in which the phase of a transmitted signal is varied to convey information.

PSNR (Peak Signal to Noise Ratio) – A measure for image quality.

PSTN (Public Switched Telephone Network) – The worldwide voice telephone network. Once only an analog system, the heart of most telephone networks today is all digital. In the U.S., most of the remaining analog lines are the ones from your house or office to the telephone company's central office (CO). Also know as POTS.

PSW (Pan and Scan Window) – For automatic pan and scan mode, the video is unsqueezed to 16:9 and a portion of the image is shown at full height on a 4:3 screen by following a 'center of interest' offset that's encoded in the video stream according to the preferences of the people who transferred the film to video. The pan and scan window is 75% of the full width, which reduces the horizontal pixels from 720 to 540.

Psycho-Acoustic Model – A mathematical model for the masking effects of the human auditory system.

PTS (Presentation Time Stamp) – a) The time at which a presentation unit is to be available to the viewer. **b)** Time stamp for vision and sound integrated into PES, transmitted at least once every 0.7 sec.

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

PTV – See Public Television.

PTZ Camera – Pan, tilt and zoom camera.

PTZ Site Driver (or Receiver or Decoder) – An electronic device, usually a part of a video matrix switcher, which receives digital, encoded control signals in order to operate pan, tilt, zoom and focus functions.

PU (Presentation Unit) – a) One compressed picture or block of audio. **b)** Decoded AAU or a decoded picture.

Public Access – To ensure that divergent community opinion is aired on cable television, FCC rules require systems in the top 100 markets to set aside one public access channel along with the education and government channels. The public access channel is free and available at all times on a first-come, first-served basis for noncommercial use by the general public.

Public Television – Television stations and networks that operate as non-commercial ventures.

Puck – Another name for a capstan idler.

PUH (Pickup Head) – The assembly of optics and electronics that reads data from a disc.

Pull-Data Model – Flexible architecture. A scene is described by a Java class, which is responsible for retrieving bits from the bitstream. See Push-Data Model.

Pull-Down – Technique the eliminates redundant frames when converting film material (24 fps) into NTSC (30 fps).

Pull-Down Phase – In a project based on an NTSC 24-fps to 30 fps transfer, the video frame at which a master clip starts: A, B, X, C or D. The pull-down phase represents the pull-down to timecode relationship.

Pull-In – An Avid term that combines two words – Pull-Down and IN Point. The pull-in is the column where the user logs the pull-down phase of the start timecode as either A, B, X, C or D. The user can modify this field before or after digitizing or recording.

Pull-Out – An Avid term that combines two words – Pull-Down and OUT Point. The pull-out is the column where the user logs the pull-down relationship at the sync point of the OUT point (end timecode) as either A, B, C or D. This field cannot be modified by the user and is calculated by the system based on the pull-in and the duration of the clip.

Pull-Up Resistor – Used to provide the source current for open-collector and three-state logic gates or a termination for unused inputs. Pulls the voltage level up when no other device is driving the line.

Pulse – A current or voltage that changes abruptly from one value to another and back to the original value in a finite length of time. Used to describe one particular variation in a series of wave motions.

Pulse Code Modulation (PCM) – a) Coding where analog input signal is represented by a given number of fixed-width digital samples per second. Often used for the coding employed in the telephone network. **b)** A technical term for an analog source waveform, for example, audio or video signals, expressed as periodic, numerical samples. PCM is an uncompressed digital signal. **c)** This is a form of the digital audio signal used for both CD and laserdisc. It is a serial data stream that is coded for transmission or recording. PCM is also used for many other types of serial data communications.

Pulse Distribution Amplifier – An amplifier that boosts sync strength and other control signals to the correct level required for distribution to multiple cameras, special effects generators or other equipment.

Pulse to Bar Ratios – The amplitude ratio between a 2T pulse and a line bar is sometimes used as an indication of short time distortion. The results of this measurement can be described in units of K-2T or K-PB.

Pulse Width Modulation (PWM) – PWM is a way of digitally encoding analog signal levels, which allows for digital control of analog circuits. This, in turn, helps to reduce cost, size, heat, and power consumption in devices such as consumer audio hardware.

Pulse-Bar Inequality – Kpulse/bar=1/4 | (barpulse)/pulse | X 100%

Pulser – See Logic Pulser.

Pulse-to-Bar Ratio – (pulse/bar) X 100%

Push – Operation of adding a word to the stack.

Push-Data Model – Non-flexible, bitstream driven architecture. The decoder reacts to explicit "instructions" in the bitstream. See Pull-Data Model.

Push-Down Stack – See Stack.

P-vop (Predictive-coded VOP) – A picture that is coded using motion compensated prediction from the past vop.

PVW – See Preview.

PX64 – Similar to MPEG, but adapted to slower bit rates. Typically used for video conferencing over one or more ISDN lines.

▶ Q

Q – See Quantization.

Q.2931 – An ITU signaling protocol for access to B-ISDN/ATM.

Q-1 – See Inverse Quantization.

QAM – See Quadrature Amplitude Modulation.

QCIF – See Quarter Common Interface Format.

QE (Quadrature Error) – Quadrature error is the phase error when the specified phase relationship between any two channels is nominally 90 electrical degrees.

QEF (Quasi Error Free) – Less than one uncorrected error per hour at the input of the MPEG-2 decoder.

QEV (Quadrature Error Vector)

QoS – See Quality of Service.

QoS (Quality of Service) – a) Bandwidth and management process to meet an application's requirements for time sensitive and correct delivery of information. **b)** The performance that an elementary stream requests from the delivery channel through which it is transported, characterized by a set of parameters (e.g., bit rate, delay jitter, bit error rate).

QPSK (Quaternary Phase Shift Keying) – Type of modulation for digital signals (DVB-S). The digital, serial signal components I and Q directly control phase shift keying. The constellation diagram with its four discrete states is obtained by representing the signal components using the I and Q signals as coordinate axes. Due to the high nonlinear distortion in the satellite channel, this type of modulation is used for satellite transmission. The four discrete states all have the same amplitude that is why nonlinear amplitude distortions have no effect.

QS (Quantization Scaling)

QSIF – See Quarter Square Interface Format.

Quad Chroma – This is another name for 4FSC because the pixel clock is four times the frequency of the chroma burst. For (M) NTSC the pixel clock is 14.32 MHz (4 x 3.579545 MHz), and 17.73 MHz (4 x 4.43361875 MHz) in (B, D, G, H, I) PAL systems.

Quad Compressor – Equipment that simultaneously displays parts or more than one image on a single monitor. It usually refers to four quadrants display. Also called Split Screen Unit.

Quad Select – The matrix and its control that select the video sources feeding each of the four quadrants of a quad split. This is a separate option on the 4100 but has been integrated into the quad split on the AVC.

Quad Split – The visual effect of dividing a picture into four segments, each of which may display video from a separate source. Also the name of the switcher panel module which controls this effect.

Quadrature Amplitude Modulation – a) A process that allows two signals to modulate a single carrier frequency. the two signals of interest Amplitude Modulate carrier signals which are the same frequency but differ in phase by 90 degrees (hence the Quadrature notation). The two resultant signals can be added together, and both signals recovered at the other end, if they are also demodulated 90 degrees apart. **b)** Type of modulation for digital signals (DVB-C). Two signal components I and Q are quantized and modulated onto two orthogonal carriers as appropriate for the QAM level (4, 16, 32, 64, 128, 256). The constellation diagram is obtained by plotting the signal components with I and Q as the coordinate axes. Therefore, 2, 3, 4, 5, 6 or 8 bits of a data stream are transmitted with one symbol, depending on the QAM level (4, 16, 32, 64, 128, 256). This type of modulation is used in cable systems and for coding the COFDM single carriers. **c)** Method for modulating two carriers. The carriers can be analog or digital.

Quadrature Distortion – Distortion results from the asymmetry of sidebands used in vestigial-sideband television transmission. Quadrature distortion appears when envelope detection is used, but can be eliminated by using a synchronous demodulator.

Quadrature Modulation – The modulation of two carrier components, which are 90 degrees apart in phase.

Quality Assessment – The (subjective) process in measuring the quality of an image or video sequence as it appears to humans. Humans find certain types of errors (image distortions) to be more acceptable than others. In video coding, one is often trying to maximize the subjective quality of the video produced by the coding algorithm, which is often quite different than the mathematical quality (measured, for example, by the peak signal to noise ratio or PSNR).

Quantization (Q) – a) The process of converting a continuous analog input into a set of discrete output levels. **b)** A process in which the continuous range of values of an input signal is divided into non-overlapping subranges, and to each subrange a discrete value of the output is uniquely assigned. Whenever the signal value falls within a given subrange, the output has the corresponding discrete value.

Quantization Error – The amount that the digital quantity differs from the analog quantity.

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

Quantization Matrix – A set of sixty-four 8-bit values used by the dequantizer.

Quantization Noise – Inaccurate digital representations of an analog signal that occurs during the analog-to-digital signal processing. Typically, the digital interpretation of video resolution is limited through the digital sampling of the analog video input signal.

Quantized DCT Coefficients – DCT coefficients before Dequantization. A variable length coded representation of quantized DCT coefficients is stored as part of the compressed video bit stream.

Quantizer – A processing step which intentionally reduces the precision of DCT coefficients.

Quantizer Scale – A scale factor coded in the bit stream and used by the decoding process to scale the dequantization.

Quantizing – The process of converting the voltage level of a signal into digital data before or after the signal has been sampled.

Quantizing (Quantization) Noise – The noise (devia-tion of a signal from its original or correct value) which results from the quantization process. In serial digital, a granular type of noise only present in the presence of a signal.

Quantizing Error – Inaccuracies in the digital representation of an analog signal. These errors occur because of limitations in the resolution of the digitizing process.

Quarter Common Interface Format (QCIF) – This video format is often used in low cost video phones. This format has a luminance resolution of 176 x 144 active pixels per line, a refresh rate of 29.97 frames per second at uncompressed bit rate of 9.115 Mbits/s.

Quarter Square Interface Format (QSIF) – a) Defines square pixels used in computer applications. **b)** 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.

Quarter-Track – See Four-Track.

Quick Compressor – A compressor compatible with Indeo video interactive that handles data more quickly than the offline compressor. Videos that compress in hours can take minutes using the quick compressor. Compare Offline Encoder.

QuickTime – QuickTime is a software platform from Apple, that allows integration of audio visual data into software applications. It supports various algorithms through its built-in image compression manager. The algorithms supported include CinePak, JPEG, and MPEG. QuickTime files have the file extension ".mov".

QuickTime for Windows – Apple's multimedia playback environment for Microsoft' Windows operating system. You use QuickTime for Windows by installing several drivers and libraries on your hard disk.

Quiet Line – A horizontal quiet line in the vertical interval is sometimes used to evaluate the amount of noise introduced in a certain part of the transmission path. A line is reinserted (and is therefore relatively noise-free) at one end of the transmission path of interest. This ensures that any noise measured on that line at the other end was introduced in that part of the path.

Quit – To stop running an application.

QXGA – A video graphics resolution of 2048 x 1536.

▶ R

R, G, B Color Space – a) An additive color space with colorimetric coordinates based on red, green, and blue stimuli or primaries. Color values are negative in certain areas outside the gamut defined by the R, G, B primaries. The R, G, B values used are intensities. **b)** The three linear video signals carrying respectively the red, the green, and the blue information. By convention the unprimed symbols signify that there is a linear relationship between the luminance in each spectral region and the corresponding video signal. The spectral composition of the luminance forming each of these signals is one of the specifications required of the video system. The recently adopted CCIR Rec 709 reflects worldwide agreement on the current definition of R, G, B primary colors. CCIR Rec 709 identifies this as an interim agreement to be superseded by preferred primary colors encompassing a wider color gamut as soon as the technologies and practices permit. **c)** The colorimetric coordinates defined by thee nonlinear video signals carrying respectively the red, the green, and the blue information. By convention the primed symbols signify that there has been a nonlinear transformation of the video signals vs. luminance, relative, scene, with its resulting modification of the opto-electric transfer function.

Rack – a) The physical setting of a head in the direction toward or away from the tape. **b)** A frame carrying film in a processing machine.

Radio Common Carrier – Common carriers whose major businesses include radio paging and mobile telephone services.

Radix – Total number of distinct characters or numbers used in a numbering system. Same as Base.

RAID (Redundant Array of Independent Disks) – a) Using more than one drive to achieve either higher throughput, security or both. New technology has made it possible to create EIDE RAID systems that give excellent performance at a very low cost. **b)** 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. A series of RAID configurations is defined by levels and, being designed by computer people, they start counting from zero. Different levels are suited to different applications.

Level 0:	No redundancy, benefits only of speed and capacity, generated by combining a number of disks. Also known as "striping".
Level 1:	Complete mirror system, two sets of disks both reading and writing the same data. This has the benefits of Level 0 plus the security of full redundancy, but at twice the cost. Some performance advantage can be gained in read because only one copy need be read, so two reads can occur simultaneously.
Level 2:	An array of nine disks. Each byte is recorded with one bit on each of eight disks and a parity bit recorded to the ninth. This level is rarely, if ever, used.
Level 3:	An array of n+1 disks recording 512 byte sectors on each of the n disks to create n x 512 "super sectors" + 1 x 512 parity sector on the additional disk which is used to check the data. The minimum unit of transfer is a whole superblock. This is most suitable for systems in which large amounts of sequential data are transferred, such as for audio and video. For these, it is the most efficient RAID level since it is never necessary to read/modify/write the parity block. It is less suitable for database types of access in which small amounts of data need to be transferred at random.
Level 4:	The same as Level 3 but individual blocks can be transferred. When data is written it is necessary to read the old data and parity blocks before writing the new data as well as the updated parity block, which reduces performance.
Level 5:	The same as Level 4 but the role of the parity disk is rotated for each block. In Level 4, the parity disk receives excessive load for writes and no load for reads. In Level 5 the load is balanced across the disks.

RAM (Random Access Memory) – a) The chips in a computer that contain its working memory. **b)** Usually used to mean semiconductor read/write memory. Strictly speaking, ROMs are also RAMs. See also Random Access. **c)** This term has come to mean any semiconductor memory whose write access time is approximately the same as its read access time. This is typically taken to include SRAMs (Static RAMs) and DRAMs (Dynamic RAMs). This definition specifically eliminates memories that cannot be altered at all and memories that require a special fixture for erasing (such as EPROMs).

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

Ramped Color – Color intensity extracted from a "smooth" set of predetermined values varying from an initial to a final intensity.

Random Access – a) The process of beginning to read and decode the coded bit stream at an arbitrary point. **b)** Access method in which each word can be retrieved in the same amount of time (i.e., the memory locations can be accessed in any order).

Random Interlace – a) Obsolete form of inexpensive 525 scanning-line system with such poor interlace that line pairing was the norm rather than

the exception. **b)** In a camera that has a free-running horizontal sync as opposed to a 2:1 interlace type that has the sync locked and therefore has both fields in a frame interlocked together accurately.

Random Logic – Hard-wired (or random) logic design solutions require interconnection of numerous integrated circuits representing the logic elements. The function of the circuit is determined by the functional blocks and their interconnections, rather than by a program.

Random Noise – Also called thermal noise, a transmission or recording impairment that manifests itself as snow in a picture and hiss in sound. A number of techniques have been developed to reduce random noise in a picture through signal averaging.

Random Noise (Weighted) – The signal-to-weighted noise ratio is the ratio in decibels, of the nominal amplitude of the luminance signal (100 IRE units) to the RMS amplitude of the noise measured at the receiving end after band limiting and weighting with a specified network. The measurement should be made with an instrument having, in terms of power, a time constant or integrating time of 0.4 seconds.

Randomized Rounding – Digitizing technique whereby the contouring effects of digital video are minimized by adding a small amount of random noise to the signal. Also see Dithering.

RAS (Row Address Strobe) – A DRAM control signal.

Raster – a) A series of horizontal scan lines that make up a display. The scanned (illuminated) area of the cathode-ray picture tube. b) A set of scanning lines; also the type of image sampling using scanning lines (as in raster scanning).

Raster Graphics – Images defined as a set of pixels or dots in a column-and-row format. Also called Bitmapped Graphics.

Raster Scan – A scan of a screen/monitor from left to right and top line to bottom line.

Rate Conversion – a) Technically, the process of converting from one sample rate to another. The digital sample rate for the component format is 13.5 MHz; for the composite format it is either 14.3 MHz for NTSC or 17.7 MHz for PAL. **b)** Often used incorrectly to indi-cate both resampling of digital rates and encoding/decoding.

Rate Distortion Theory – The study of the distortion (error) of a lossy coding algorithm as a function of the bit rate. Rate distortion theory sets the lower bound on the bit rate as a function of the distortion.

Raw – A bitstream format in which the video data is uncompressed. See Compress, Encode.

Raw Footage – Videotape recordings that have not been edited.

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 method where each pixel is calculated to reflect or refract off, or through, any surface encountered to simulate a true optical ray. This produces more realistic images but is computationally expensive and time-consuming and can involve the use of more memory.

RBOC (Regional Bell Operating Company) – An acronym sometimes applied to the Baby Bell holding companies and sometimes to individual Bell telephone companies. See also Baby Bell.

RC Time Code (Rewritable Consumer) – A time code system, available on 8 mm and Hi-8 formats only, supported by the thumbs up editor. The code can be added either before or after video recording without affecting the video or audio.

RCA (Radio Corporation of America) – Now part of GE. RCA was once involved in every aspect of television, from camera to receiver, supplying production, transmission, consumer electronic, and CATV equipment, and operating a television network (NBC) and a satellite transmission carrier. RCA developed the first effective HDTV camera tube, proposed several HDEP schemes ranging from 750 to 2625 scanning lines, and did extensive ATV research at RCA Laboratories (now SRI International's DSRC). RCA's broadcast equipment group no longer exists, Burle is selling its tubes, and its consumer electronics are now part of the Thomson group. GE has, thus far, retained the satellite transmission carrier (renaming it GE Americom) and the NBC television network, a proponent of the ACTV ATV schemes.

RCA Connector – A type of connector used on all consumer VCRs and camcorders to carry the standard composite video and audio signals. See also Phono.

RCC – See Radio Common Carrier.

RCT (Return Channel Terrestrial) – This provides the return path from the home user (end-user) of Free-over-the-air TV or Over-the-air broadcasted (see Terrestrial) signals to the broadcaster/ITV content providers. It's often most associated with Interactive Digital Television. See Back Channel.

RCT-MAC – Medium Access Control of DVB-RCT.

RCT-PHY – Physical Layer of DVB-RCT.

RCTT (DBV-RCT Terminal)

RDI (Remote Defect Indication) – a) Indication that a failure has occurred at the far end of the network. Unlike FERF (far-end remote failure), the RDI alarm indication does not identify the specific circuit in a failure condition. **b)** In ATM, when the physical layer detects loss of signal or cell synchronization, RDI cells are used to report a VPC/VCC failure. RDI cells are sent upstream by a VPC/VCC endpoint to notify the source VPC/VCC endpoint of the downstream failure.

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 applied the modified signal to the record heads so that it can be re-recorded onto the tape in its original position.

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 (Error Correction Code) 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 Audio – A proprietary system for streaming audio (and now video) over the Internet. Before Real Audio, users had to download an entire audio file before they could listen to it. Also supports real-time broadcast of audio and video programs. Many radio stations now broadcast on the Internet using Real Audio.

Real Time – a) Actual elapsed time (as opposed to "tape time"). **b)** Displaying an image or responding to a user's request almost simultaneously. When you display an animation in real time, you perform the movements at the speed you made them in the animation. **c)** Computation or processing done in the present to control physical events occurring in the present. For example, when a digital effects system operator moves a joystick and the video images on the monitor appear to move simultaneously, the computations required to make the images move are said to have occurred in real time. **d)** A transmission that occurs right away, without any perceptible delay. Very important in video conferencing, as much delay will make the system very unusable.

Real Time Clock – Timing signal derived from the house composite sync.

Real Time Counter – A display showing hours-minutes-seconds of tape that has been recorded (elapsed time), or how much tape remains.

Real Time Recording – Refers to the top speed of a video recorder; governed by the monitor, pictures are available as fast as the video can accept them.

RealAudio – RealAudio is an on-line audio software platform, from the company Progressive Networks, dedicated to audio links on the Internet via 14.4 kbit/s, 28.8 kbit/s or faster connections. RealAudio software features a player, a server and development tools, and is available for Windows, Unix and Apple Macintosh environments.

RealMedia – Architecture designed specifically for the Web, featuring multimedia streaming and low data-rate compression options. RealMedia works with or without a RealMedia server.

Real-Time Control Audio – See RTCP.

Real-Time Processing – The processing of samples at the rate that they are received.

Real-Time Streaming Protocol – See RTSP.

Real-Time Transport Protocol – See RTP.

Rec Cal – A control which matches the signal level monitored in the input position of the output selector switch to that of the signal recorded and played back from the tape.

Rec. 601 – CCIR recommendation (standard) for digital component video, equally applicable to 525 and 625 scanning lines, also called 4:2:2. Digital component video is about as close in quality as current 525 scanning line equipment can come to ATV. See ITU-R BT.601-2.

Recall – The act of calling stored data out of memory.

Receiver-Compatible – Term used for an ATV scheme that allows existing NTSC television sets to tune into the ATV signal and get pictures and sounds; also used to describe an MIT ATV scheme utilizing blanking adjustment for aspect ratio accommodation and utilizing various sub-channels to carry additional information but requiring a very complex receiver to recover that information. It is said to offer 600 lines of vertical and 660 lines of horizontal static luminance resolution, with reduced static diagonal resolution and with dynamic resolution comparable to NTSC. The term Receiver Compatibility, as it is usually used, allows some degradation in pictures from the highest NTSC quality, in the same way that the receiver-compatible NTSC color system introduced cross-luminance to existing black-and-white TV sets.

Reclocking – The process of clocking the data with a regenerated clock.

Reconstructed Frame – A reconstructed frame consists of three matrices of 8-bit numbers representing the luminance and two chrominance signals.

Reconstructed Picture – A reconstructed picture is the result of decoding a coded picture.

Reconstructed vop – A reconstructed vop is obtained by decoding a coded vop.

Record – To convert analog video and audio signals to an Avid compressed digital signal format.

Record Level – The amount of energy delivered to the recording head and to the magnetic tape. Indicated by the VU meter and measured in nanowebers per meter.

Record Review – A feature on many video cameras and camcorders that allows the videographer to see the last few seconds of video recorded on the videotape.

Record Tabs – Those plastic tabs seen in the back edge of a cassette. When removed, sensing fingers prevent the record button from being depressed.

Recorder, Film – Equipment for transducing a video waveform into displayed images, and making a record of such images on motion-picture film so that they may be stored and subsequently retrieved as film images.

Recorder, Video – Equipment for making a record of a video waveform so that the mapped images may be stored and subsequently retrieved as the video waveform.

Recording Level Meter – An indicator on a tape recorder that provides some idea of the signal levels being applied to the tape from moment to moment. It is intended as an aid in setting the recording levels.

Recording Speed (IPS) – Refers to the number of inches per second, or centimeters per second, of tape movement.

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

Reduction Printing – Making a copy of smaller size than the original by optical printing.

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

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

Reed-Solomon Protection Guide – Refers to (usually) 16 bytes of error control code that can be added to every transport packet during modulation.

Reel – The flanged hub, made of metal, glass or plastic, on which magnetic tape is wound. Generally, a spool of tape is referred to as a reel, and a spool of film is referred to as a roll.

Reel Number – Number assigned by operator to each reel or cassette of video tape used in the editing session. The reel number identifies each reel or cassette on edit list for final assembly or for future revisions.

Ref Sync Amplitude – Refer to the Horizontal Timing discussion.

Reference – A space where objects exist as a set of mathematical descriptions. In a 3D scene, references are used to organize the objects (position, orientation and scaling) by defining a parent-child relationship.

Reference Black Level – Refer to the Horizontal Timing discussion.

Reference Picture – Reference pictures are the nearest adjacent I or P pictures to the current picture in display order.

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

Reference Point – A location in the data or control flow of a system that has some defined characteristics.

Reference Tape – A tape used as a reference against which the performances of other tapes are compared. The use of a reference tape is necessary in specifying most performance characteristics because of the difficulty of expressing these characteristics in absolute terms.

Reference Video – a) Video signal which is used to synchronize different pieces of video equipment by providing a common timing signal. It is generated from a single source and distributed. Typically, reference video consists of black color or color bars, and control track pulses. **b)** A composite video signal used to compare all other video signals to for timing purposes.

Reference vop – A reference frame is a reconstructed vop that was coded in the form of a coded I-vop or coded P-vop. Reference vops are used for forward and backward prediction when P-vops and B-vops are decoded.

Reference White Level – The level corresponding to the specified maximum excursion of the luminance signal in the white direction. Refer to the Horizontal Timing discussion.

Reflectance Factor R – Ratio of the radiant or luminous flux reflected in the directions delimited by the given cone to the reflected in the same directions by a perfect reflecting diffuser identically irradiated or illuminated.

Reflected Sound – Sound which reaches a mike or listener after one or more reflections from surrounding surfaces.

Reflections or Echoes – In video transmission, this may refer either to a signal or to the picture produced. **a) Signal:** Waves reflected from structures or other objects; waves which are the result of impedance or other irregularities in the transmission medium. **b) Picture:** "Echoes" observed in the picture produced by the reflected waves.

Refresh – a) An image drawn on a CRT display remains visible only for a few milliseconds (the persistence of the screen phosphor), unless it is redrawn continuously. This process is called display refresh or screen refresh. Different displays use different refresh rates, but display refresh is normally required between 60 and 80 times a second to avoid any visible screen flickering. 75 times a second is a common refresh rate. In general, a higher refresh rate results in a more stable appearing display. **b)** Process of restoring the charge in a dynamic memory. Refresh logic must rewrite the contents of the complete RAM periodically (typically 2 ms), called refreshing the memory. See Dynamic Memory.

Regenerative Pulse Distribution Amplifier (Regenerative Pulse DA) – Reconstructs the signal and allows for adjustment of delay. Also see Linear Pulse DA.

Region Coding – Region coding has received attention because of the ease with which it can be decoded and the fact that a coder of this type is used in Intel's Digital Video Interactive system (DVI), the only commercially available system designed expressly for low-cost, low-bandwidth multimedia video. Its operation is relatively simple. Envision a decoder that can reproduce certain image primitives well. A typical set of image primitives might consist of rectangular areas of constant color, smooth shaded patches and some textures. The image is analyzed into regions that can be expressed in terms of these primitives. The analysis is usually performed using a tree-structured decomposition where each part of the image is successively divided into smaller regions until a patch that meets either the bandwidth constraints or the quality desired can be fitted. Only the tree description and the parameters for each leaf need then be transmitted. Since the decoder is optimized for the reconstruction of these primitives, it is relatively simple to build. To account for image data that does not encode easily using the available primitives, actual image data can also be encoded and transmitted, but this is not as efficient as fitting a patch. This coder can also be combined with prediction (as it is in DVI), and the predicted difference image can then be region coded. A key element in the encoding operation is a region growing step where adjacent image patches that are distinct leaves of the tree are combined into a single patch. This approach has been considered highly asymmetric in that significantly more processing is required for encoding/analysis than for decoding. While hardware implementations of the hybrid DCT coder have been built for extremely low bandwidth teleconferencing and for HDTV, there is no hardware for a region coder. However, such an assessment is deceptive since much of the processing used in DVI compression is in the motion predictor, a function common to both methods. In fact, all compression schemes are asymmetric, the difference is a matter of degree rather than one of essentials.

Region of Interest – The part of an image that the user identifies as the target for a motion tracking operation. Also called the Search Pattern.

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

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

Register – a) Single word of memory. Registers within the CPU are more readily accessible than external memory locations. Registers external to the CPU are simply a group of flip-flops. **b)** A memory storage location. Each can store the data for a complete switcher setup. c) In a VGA controller, these are the storage elements that contain data relating to the mode or configuration of the device, as opposed to the display memory, which contains the image. Traditionally, the registers are divided into six groups: General, Sequencer, CRT Controller, Graphics Controllers, Attribute, and Extensions. The registers are accessed by a number of addressing schemes, usually involving an index or address register and a data register.

Register-Level Compatibility – If a peripheral is compatible at the register level with another peripheral, it means that every bit in every register of the two devices has precisely the same meaning. This implies that application programs can circumvent the BIOS and directly program registers in a peripheral device without functionality problems.

Registration – a) The accuracy of having all three images (red, green and blue) with exactly the same geometry. b) An adjustment associated with color sets and projection TVs to ensure that the electron beams of the three primary colors of the phosphor screen are hitting the proper color dots/stripes.

Rehearse – To play a sequence in the timeline from the pre-roll through the post-roll.

Rehearse Post-Roll – To play a sequence in the timeline from the current position to the post-roll.

Rehearse Pre-Roll – To play a sequence in the timeline from the pre-roll to the current position.

Relative Addressing – Specifying an address as a distance from the current address (e.g., three bytes ahead or four bytes backwards).

Relative Burst Gain Error – The change in gain (amplitude) of the color burst signal relative to the gain (amplitude) of the chrominance subcarrier, in the active line time, caused by processing the video signal.

Relative Burst Phase Error – The change in phase of the color burst signal relative to the phase of the chrominance subcarrier, in the active line time, caused by processing the video signal.

Relative Chroma Level – See Chrominance-to-Luminance Gain.

Relay – An electromagnetically operated switch.

Release Print – In a motion picture processing laboratory, any of numerous duplicate prints of a subject made for general theatre distribution.

Reluctance – Resistance to the flow of magnetic flux.

Remanance – The amount of magnetism left in a magnetic material after the removal of the magnetizing force.

Remote – Any program originating outside the studio.

Remote Control – A transmitting and receiving of signals for controlling remote devices such as pan and tilt units, lens functions, wash and wipe control and similar.

Remote Socket – A socket on a VCR or video camera which when connected, permits remote control of the unit. Remotes may be wired or wireless (infrared) and allow such control as play, pause, record, fast forward and rewind. See Edit Control.

Remote Switcher – A video switcher which is connected to the camera cables and which contains the switching electronics. This unit may be remotely located and connected to a desktop controller by a single cable for each monitor.

Remote Workstation, Drive, Disk, File System, or Printer – A hardware device or the information or media it contains that can be accessed across the network; they are not physically connected to the workstation.

Render Method – A method of the AV object class that performs the composition and rendering of the AV object.

Render to Disk – Since it can take considerable time to render a single 3D image, and most of that time is CPU compute time, many facilities using PC-based rendering systems have used large Winchester disks to which they send their final rendered images. This frees up the frame buffer for other work in the meantime. Later, when the animation is fully computed, the disk images can be quickly recalled and placed in the frame buffer, before being sent to videotape.

Rendering – a) The process of drawing the database, making it visible, is called rendering. There are many ways to render the same database; as a "wireframe", as a wireframe with "hidden" lines removed, or as a solid with various types of "shading". **b)** This is the process by which the video editing software and hardware convert the raw video, effects, transitions and filters into a new continuous video file. **c)** The process of non-real time drawing of a picture relying on computer processing speed for graphics and compositing. **d)** The action of transforming a scene description and its media objects from a common representation space to a specific presentation device (i.e., speakers and a viewing window).

Rendering Area – The portion of the display device's screen into which the scene description and its media objects are to be rendered.

Repeat Effect – A type of effect for repeating a frame so that it appears to "freeze" or stop the frame, or for repeating a series of frames, such as a series of animation frames.

Repeater – Repeaters are transparent devices used to interconnect segments of an extended network with identical protocols and speeds at the Physical Layer (OSI layer 1). An example of a repeater connection would be the linkage of two carrier sense multiple access/collision detection (CSMA/CD) segments within a network.

Replace Effect – An edit in which a segment in the sequence is overwritten or replaced with source material of matching duration.

Replication – One method of hardware zooming is accomplished by multiplying the number of pixels and is known as pixel replication or simply, replication. Because replication increases the size of pixels and the effect is a blocky picture when zoomed, interpolation is a preferred technology where intermediate pixels are approximated causing less block video.

Reproduce Level – A control which determines the output level of signals played back from the tape by the reproduce head.

Resampling – Video image information may be presented in a specific system with, for example, its own frame rate, line count per frame, and line resolution (if the system is analog, resolution = video bandwidth; if the

system is digital, resolution = pixels per line) and need to be recast into a target system differing in one or more of the specifications. Or in post-production, it may be desirable to change image size, to crop or zoom, or to distort geometrically, etc. The original signal is sampled and the samples processed by a suitable algorithm to generate a new set of samples compatible with the specifications of the target system.

ReSerVation Protocol (RSVP) – RSVP supports QoS classes in IP applications, such as videoconferencing and multimedia.

Reserved – The term "reserved" when used in the clause defining the coded bit stream, indicates that the value may be used in the future for ISO defined extensions. Unless otherwise specified within the present document all "reserved" bits shall be set to "1".

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

reserved_future_use – The term "reserved_future_use", when used in the clause defining the coded bit stream, indicates that the value may be used in the future for ETSI defined extensions. Unless otherwise specified all "reserved_future_use" bits shall be set to "1".

Reset – To activate a restart sequence to a CPU, ILC or other device which has locked up or is for some other reason not responding correctly.

Reset Button – A physical button on the workstation that you press to reinitialize the processor and some other hardware without removing power to the workstation. You should never press this button while IRIX is running, unless all attempts to shut down the system using software fail. See also Shut Down.

Residual Color – The amount of color in the image of a white target after a color camera has been white balanced. The less color, the better the camera.

Residual Flux – In a uniformly magnetized sample of magnetic material, the product of the residual flux density and the cross-sectional area. Residual flux is indicative of the output that can be expected from a tape at long wavelengths.

Residual Flux Density, Br Gauss – The magnetic flux density at which the magnetizing field strength is zero when a sample of magnetic material is in a symmetrically cyclically magnetized condition. Normally, the residual flux density of a tape is measured in the orientation direction, using an alternating magnetizing field of amplitude 1000 Oe. Residual flux density is indicative of the output that can be expected from a tape at short wavelengths.

Residual Subcarrier – The amount of color subcarrier information in the color data after decoding a composite color video signal. Values appears as -n dB where the larger n, the better.

Residual-to-Maximum Flux Ratio – In tapes consisting of oriented, acicular particles, this ratio is an indication of the degree of particle orientation. Theoretically, the ratio varies from 0.5 for randomly oriented particles to 1.0 for completely oriented particles. In practice, oriented tapes typically have ratios between 0.70 and 0.76.

Resistance – Opposition to the flow of electrons.

Resolution – The sharpness or "crispness" of the picture. Resolution can be measured numerically by establishing the number of scanning lines used to create each frame of video. a) The number of bits (four, eight, ten, etc.) determines the resolution of the digital signal; 4-bits = a resolution of 1 in 16, 8-bits = a resolution of 1 in 256 (minimum for broadcast TV), 10-bits = a resolution of 1 in 1024. b) The basic measurement of how much information is on the screen. It is usually described as the number of pixels in the horizontal axis by the number of horizontal lines. The higher the numbers, the better the system's resolution. Some typical resolutions are: NTSC VHS – 240 x 485; NTSC broadcast – 330 x 485; NTSC laserdisc – 425 x 485; ITU-R BT.601 (525/60) – 720 x 485; Computer screen – 1280 x 1024. c) The capability of making distinguishable individual parts of an image. A measure of how clear the picture looks. d) Perceivable detail. See also Chroma Resolution, Diagonal Resolution, Dynamic Resolution, Horizontal Resolution, Spatial Resolution, Static Resolution and Temporal Resolution. e) The amount of detail in an image. Higher resolution equals more detail. Generally expressed in "lines". It is the number of vertical line pairs that the system can distinguish, and has no relationship to the number of horizontal scan lines.

Resolution Independent – A term to describe equipment that can work in more than one resolution. Dedicated TV equipment is designed to operate at a single resolution although some modern equipment, especially that using the ITU-R 601 standard, can switch between the specific formats and aspect ratios of 525/60 and 625/50. By their nature, computers can handle files of any size, so when applied to imaging, they are termed resolution independent. As the images get bigger so the amount of processing, storage and data transfer demanded increases, in proportion to the resulting file size. So, for a given platform, the speed of operation slows. Other considerations when changing image resolution may be reformatting disks, checking if the RAM is sufficient to handle the required size of file, allowing extra time for RAM/disk caching and how to show the picture on an appropriate display.

Resolution, Color – The number of simultaneous colors is determined by the number of bits associated with each pixel in the display memory. The more colors, the more bits. If n bits per pixel are used, 2n color combinations can be generated. EGA uses from 1-4 bits per pixel, permitting up to 16 (24) colors to be displayed on the screen simultaneously. The BGA has an added mode that supports 8 bits per pixel, or 256 (28) simultaneous colors.

Resolution, Horizontal – The amount of resolvable detail in the horizontal direction in a picture. It is usually expressed as the number of distinct vertical lines, alternately black and white, which can be seen in three-quarters of the width of the picture. This information usually is derived by observation of the vertical wedge of a test pattern. A picture which is sharp and clear and shows small details has a good, or high resolution. If the picture is soft and blurred and small details are indistinct it has poor, or low resolution. Horizontal resolution depends upon the high-frequency amplitude and phase response of the pickup equipment, the transmission medium and the picture monitor, as well as the size of the scanning spots.

Resolution, Image – In the practical sense, resolution is usually judged by imaging test targets bearing sets of spaced black-and-white lines in a square-wave pattern, and determining the minimum spacing for which

the lines are distinguishable in the resultant image. With instrumentation readout, resolution target charts are less ambiguous and more useful if they bear sets of spaced "black" and "white" lines sine wave modulated in density, rather than square-wave modulated. Whereas square-wave targets introduce a Fourier series of higher frequencies, sine wave targets limit the analysis to a single frequency for each line set. Quantitative measurement of the modulations provides convenient determination of the transfer function.

Resolution, Spatial – The number of pixels in an area or on the screen. Resolution is typically specified as pixels per scan line and scan lines per frame. Higher resolution images require more processing and greater storage requirements per image. In addition, monitor costs increase with resolution, particularly above about one million pixels. Different applications require different resolutions.

Resolution, Vertical – The amount of resolvable detail in the vertical direction in a picture. It is usually expressed as the number of distinct horizontal lines, alternately black and white, which can be seen in a test pattern. Vertical resolution is primarily fixed by the number of horizontal scanning lines per frame. Beyond this, vertical resolution depends on the size and shape of the scanning spots of the pickup equipment and picture monitor and does not depend upon the high-frequency response or bandwidth of the transmission medium or picture monitor.

Resolution, Visual – a) Qualitatively: Capacity for seeing distinctly fine details that have a very small angular separation. **b)** Quantitatively: Any of a number of measures of spatial discrimination such as the reciprocal of the value of the angular separation in minutes of arc of two neighboring objects (points or lines or other specified stimuli) which the observer can just perceive to be separate. **c)** In system design, the reference value for normal human visual limiting resolution is 30 cycles/degree, i.e., 60 TV lines per angular degree subtended at the viewing position. For systems of current interest, the maximum viewing distances for discrete vertical resolution of the number of lines presented are shown in the following table.

Limiting Resolution of Vertical Detail (1)

TV Line Total	Per Frame Active	Subtended Vertical Angle	Maximum Viewing Distance (1) (2)
525	485	8.08"	7.1h (3) = 5.3w (4)
625	575	9.58"	6.0h = 4.5w (4)
1125	1035	17.25"	3.3h = 1.9W (5)

(1) No adjustment has been applied for possible interlace or Kell effects.
(2) Assumes a shadow mask, if present, is not limiting.
(3) h is vertical height of display.
(4) w is horizontal width of display for 4:3 aspect ratio.
(5) W is horizontal width of display for 16:9 aspect ratio.

Resolving Power – Classically, two point objects are considered resolved when the centers of their diffraction disks in the image are separated by at least one disk diameter. This leads to a theoretical minimum angular separation for objects at a distance:

$$a = (1.22)(\lambda)/D$$

Resolving power of a lens increases with increasing optical aperture. Systems vary enormously in the closeness with which their actual resolving power approaches this diffraction-controlled ultimate limit.

Resonant Frequency – The frequency at which a parallel LC circuit has highest opposition to current and at which a series LC circuit has the lowest opposition to current.

Resource – A unit of functionality provided by the host for use by a module. A resource defines a set of objects exchanged between module and host by which the module uses the resource.

Restore – To return a register or other computer word to its initial or preselected value.

Restore (Files) – To copy files that once resided on your hard disk from another disk or a tape back onto your hard disk.

Restorer – As used by the telephone company, a network designed to remove the effects of predistortion or preemphasis, thereby resulting in an overall normal characteristic.

Restricted Slice Structure – In order to conform to "restricted slice structure", all slices added together must cover the picture. This applies to Main Profile, for instance.

Retentivity – The maximum value of the residual flux density corresponding to saturation flux density.

Reticulation – The formation of a coarse, crackled surface on the emulsion coating of a film during improper processing. If some process solution is too hot or too alkaline, it may cause excessive swelling gelatin may fail to dry down as a smooth homogeneous layer.

Retiming – Adjustment of a local synchronizing generator which has been locked to a distant source. This permits the local facility to use the distant source in real-time production through a video switcher.

RETMA (Radio Electronic Television Manufacturers Association) – Former name of the EIA. Some older video test charts carry the name RETMA Chart.

Retrace (Return Trace) – a) The movement of the electron beam from the right-hand edge of the display to the left-hand edge or from bottom to top. Retrace occurs during the blanking time. **b)** The return of the electron beam in a CRT to the starting point after scanning. During retrace, the beam is typically turned off. All of the sync information is placed in this invisible portion of the video signal. May refer to retrace after each horizontal line or after each vertical scan (field). See Horizontal Retrace and Vertical Retrace.

Retransmission Consent – Local TV broadcasters' right to negotiate a carriage fee with local cable operators, as provided in 1992 Cable Act.

Return – In particular, an instruction at the end of a subroutine that causes control to resume at the proper point in the main routine.

Return Loss – A measure of the similarity of the impedance of a transmission line and impedance at its termination. It is a ratio, expressed in dB, of the power of the outgoing signal to the power of the signal reflected back from an impedance discontinuity.

Reverberation – The persistence of a sound after the source stops emitting it, caused by many discrete echoes arriving at the ear so closely spaced in time that the ear cannot separate them.

Reversal Process – Any photographic process in which an image is produced by secondary development of the silver halide grains that remain after the latent image has been changed to silver by primary development and destroyed by a chemical bleach. In the case of film exposed in a camera, the first developer changes the latent image to a negative silver image. This is destroyed by a bleach and the remaining silver halide is converted to a positive image by a second developer. The bleached silver and any traces of halide may now be removed with hypo.

Reverse – A command used to reverse the order of frames in a clip.

Reverse Playback – The process of displaying the picture sequence in the reverse of the input source order.

RF (Radio Frequency) – A term used to describe the radio signal band of the electromagnetic spectrum (about 3 MHz to 300 GHz). RF connectors, such as those used for the cable TV or antenna inputs on a monitor, carry modulated RF television signals.

RF Distribution – The process of supplying an RF signal to several devices simultaneously.

RF Mode – A Dolby Digital decoder operational mode intended primarily for cable set-top boxes that are connected to the RF (antenna) input of a television set. The dialnorm reference playback level is -20 dBFS and compr words are used in dynamic range compression. Refer to Dynamic Range Compression.

RF Modulation – The process of combining a video signal and/or audio signal with an RF source so the result can be transmitted to a radio receiver, television or VCR.

RF Modulator – An electronic device that modifies and RF signal using an audio and/or video signal.

RF Pattern – A term sometimes applied to describe a fine herringbone pattern in a picture. May also cause a slight horizontal displacement of scanning lines resulting in a rough or ragged vertical edge of the picture. Caused by high frequency interference.

RF Signal – a) Modulated composite (video and audio) signal produced by television stations and VCRs, and to be processed by televisions. **b)** Radio frequency signal that belongs to the region up to 300 GHz.

RF Splitter – A device that provides multiple RF signals. An RF splitter is used to send the signal from one VCR to two or more televisions.

RFC (Request For Comments) – A document that describes the specifications for a recommended technology. RFCs are used by the Internet Engineering Task Force (IETF) and other standards bodies.

RG-11 – A video coaxial cable with 75_ impedance and much thicker diameter than the popular RG-59 (of approximately 12 mm). With RG-11 much longer distances can be achieved (at least twice the RG-59), but it is more expensive and harder to work with.

RG-58 – A coaxial cable designed with 50_ impedance; therefore, not suitable for CCTV. Very similar to RG-59, only slightly thinner.

RG-59 – A type of coaxial cable that is most common in use in small to medium-size CCTV systems. It is designed with an impedance of 75_. It has an outer diameter of around 6 mm and it is a good compromise between maximum distances achievable (up to 300 m for monochrome signal and 250 m for color) and good transmission.

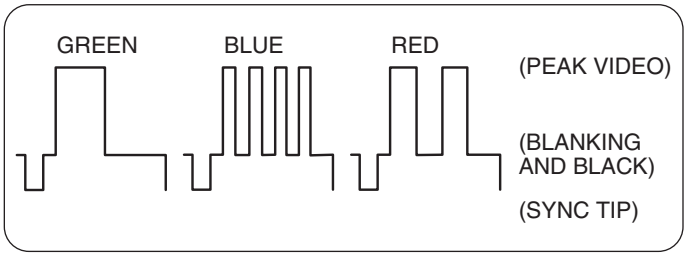
RGB (Red, Green and Blue) – a) The basic parallel component analog signal set (red, green, blue) in which a signal is used for each primary color. These three color signals are generated by the camera and are used in the color television's additive color reproduction system to produce a picture. Also used to refer to the related equipment, interconnect format or standards. The same signals may also be called "GBR" as a reminder of the mechanical sequence of connections in the SMPTE interconnect standard. **b)** A color model used chiefly for computer displays in which colors are specified according to their red, green, and blue components. Compare YUV.

RGB Chroma Key – A chroma key wherein the keying signal is derived from the separate red, green and blue camera video signals, as opposed to composite chroma key. It is an option to all switchers that allows chroma keys to be performed. See Chroma Key.

RGB Format – There are four RGB formats. The main difference between them are in the voltage levels as shown below. These voltage levels can make the formats incompatible with each other.

	SMPTE/ EBU N10	NTSC (no setup)	NTSC (setup)	MII
Max	700 mV	714 mV	714 mV	700 mV
Min	0 mV	0 mV	54 mV	53 mV
Range	700 mV	714 mV	660 mV	647 mV
Sync	–300 mV	–286 mV	–286 mV	–300 mV
P-P	1 V	1 V	1 V	1 V

Following are the basic RGB waveforms found in the four RGB standards. The signals are full amplitude unlike their color difference counterparts. Refer to the color difference discussion for an example of the color difference waveforms.



RGB System – See the RGB discussion.

RHC (Regional Holding Company) – See Baby Bell.

Ribbon Mike – A mike which uses a thin metal foil ribbon which moves in a fixed magnetic field in response to sound waves and thus generates an output for the mike.

RIFF (Resource Interchange File Format) – Not an actual file format (as the name implies), RIFF is a tagged multimedia file structure. It is a specification upon which many file formats are defined. RIFF files have the advantage of extensibility; file formats based on RIFF can be used by future software inasmuch as format changes can be ignored by existing applications.

Ringing – a) A common filter artifact, manifesting itself in television pictures as ghost-like images of sharp edges. **b)** An oscillatory transient occurring in the output of a system as a result of a sudden change in input. Results in close spaced multiple reflections, particularly noticeable when observing test patterns, equivalent square waves, or any fixed objects whose reproduction requires frequency components approximating the cutoff of the system.

RIP (Raster Image Processor) – A piece of hardware or software that converts object-oriented graphics and fonts into the bitmaps required for output on a printer.

Rise Time – Usually measured from the 10% to the 90% amplitude points of the positive going transition. The time taken for a signal to make a transition from one state to another. Faster rise times require more bandwidth in a transmission channel. See Fall Time.

Rising Edge – Low-to-high logic transition.

RLC – See Run Length Coding.

RLE – See Run Length Encoding.

RMAG (Removable Magnetic Disk) – RMAGs are used in conjunction with chassis; each chassis can hold two of these removable disk modules.

RMS (Root Mean Square) – The value assigned to an alternating current or voltage that results in the same power dissipation in a given resistance as DC current or voltage of the same numerical value. Calculated as 0.707 of peak amplitude of a sine wave at a given frequency.

RMS Value – The effective value of a wave. The value of continuous (direct current) signal that would produce the same power as the wave in question.

RNRZ (Randomized Non-Return-to-Zero Code)

Robust – Term for a transmission or recording scheme that can tolerate significant impairments, without catastrophic failure (severe degradation).

Roll – A lack of vertical synchronization which causes the picture as observed on the picture monitor to move upward or downward.

Roll Off – The effect that occurs when a piece of equipment can no longer process the frequency which is being fed into it (a reduction in amplitude with an increase of frequency).

Rolling Text – Text that moves vertically across an area over time. The most common example of rolling text is credits at the end of feature films and television programs.

Roll-Off – A gradual attenuation of gain frequency response at either or both ends of the transmission pass band.

ROM (Read-Only Memory) – Permanently programmed memory. Mask-programmed ROMs are programmed by the chip manufacturer. PROMs (Programmable ROMs) can be programmed by the user. EPROMs (Erasable PROMs) can be erased with ultraviolet light and then reprogrammed.

Root – a) The base directory from which all other directories stem, directly or indirectly. It is designated by the slash (/) character in many systems or a backslash (\) in PCs. **b)** The directory at the top of the file system hierarchy.

Root Account – The standard UNIX or IRIX login account reserved for use by the system administrator. This account's home directory is the root (/) directory of the file system; the user of the root account has full access to the entire file system (that is, can change and delete any file or directory). The user of this account is sometimes referred to as the superuser.

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

Rotary Wipe – A pattern system effect that creates a design for revealing video utilizing segments that have angular movement. This definition is our internal view, but not consistent within the industry.

Rotate (Menu) – The function used to turn or rotate an image. Rotate turns the image around the intersection of the X, Y and Z axes, the center point for rotation. Rotate does not move or reposition the center point of the image.

Rotating Pattern – A pattern system effect that reveals video through a shape or shapes that spin about an axis on the screen. This definition is our internal view, but not consistent within the industry.

Rotational Extrusion – In rotational extrusion, the silhouette is rotated about an axis, like using a lathe to create a fancy table leg. The cross-section of an object created this way is circular. Such objects are often called "solids of revolution".

Rotoscope – When animators want to capture the realism of a live object's motion, a technique called rotoscoping is used. In traditional film animation, film footage of the motion is rear-projected, one frame at a time, onto a frosted screen that is mounted on the animators worktable. The artist traces the frames onto cels. This process is called rotoscoping. The video equivalent is called keying or matteing. Digital rotoscoping has recently become possible. Here, the frame buffer is used to hold the incoming action, and software picks out the image of interest from the background, assuming the subject was shot against a solid color.

Rough Cut – Preliminary edit of raw footage to establish tentative sequence, length approximate sequence and content of the eventual video program.

Rounding – Deleting the least significant digits of a quantity and applying some rule of compensation and correction to the part retained.

Router – a) Routers connect networks at OSI layer 3. Routers interpret packet contents according to specified protocol sets, serving to connect networks with the same protocols (DECnet to DECnet, TCP/IP (Transmission Control Protocol/Internet Protocol) to TCP/IP). Routers are protocol-dependent; therefore, one router is needed for each protocol used by the network. Routers are also responsible for the determination of the best path for data packets by routing them around failed segments of the network.

b) A network device that uses routing protocols and algorithms to control the distribution of messages over optional paths in the network.

Routing Switcher – An electronic de-vice that routes a user-supplied signal (audio, video, etc.) from any input to any user-selected output(s).

RP-125 – See SMPTE 125M.

RPC (Remote Procedure Call) – A programming interface that allows one program to use the services of another program in a remote machine. The calling programming sends a message and data to the remote program, which is executed, and results are passed back to the calling program.

RPN (Reverse Polish Notation) – In digital video editing, it provides a method for processing multiple simultaneous transitions and effects. Based on a concept of data and function stacks. Commonly used with calculators, where the RPN equivalent of "1 + 2" is "1 2 +".

RRT (Region Rating Table) – An ATSC PSIP table that defines ratings systems for different regions and countries. The table includes parental guidelines based on content advisory descriptors within the transport stream.

RS Protection Code – A 16-byte long error control code added to every 187 (scrambled) +1 syncbyte-long transport packet with the following result. The packet has a length of 204 bytes and the decoder can correct up to T=8 errored bytes. This code ensures a residual error bit rate of approximately 1 x 10-11 at an input error rate of 2 x 10-4.

RS-125 – A SMPTE parallel component digital video standard.

RS-170 – The Electronics Industries Association standard for the combination of signals required to form NTSC monochrome (black and white) video.

RS-170A – a) The Electronics Industries Association standard for the combination of signals required to form NTSC color video. It has the same base as RS170, with the addition of color information. **b)** Now called EIA-170A, this is the EIA NTSC Video Signal specification standard.

RS-232 – a) A standard, single-ended (unbalanced) interconnection scheme for serial data communications. **b)** Computer communication standard used in video for the control of certain video equipment. Computer controlled VCRs, edit controllers, switchers and other studio equipment can commonly be found in professional video studios. Successfully linking two devices, at the very least, requires that they use the same communication protocol.

RS-232C – The Electronic Industries Association standard interface for connecting serial devices. Usually referred to by the original standard name of RS-232. The standard supports two types of connectors: a 25-pin D-type connector and a 9-pin D-type connector. The maximum permissible line length under the specification is approximately 15 meters.

RS-343 – RS-343 does the same thing as RS-170, defining a specification for transferring analog video, but the difference is that RS-343 is for high-resolution computer graphics analog video, while RS-170 is for TV-resolution NTSC analog video.

RS-422 – A medium range (typically up to 300 m/1000 ft or more) balanced serial data transmission standard. Data is sent using an ECL signal on two twisted pairs for bidirectional operation. Full specification includes 9-way D-type connectors and optional additional signal lines. RS-422 is widely used for control links around production and post areas for a range of equipment.

RS-485 – An advanced format of digital communications compared to RS-422. The major improvement is in the number of receivers that can be driven with this format, and this is up to 32.

RSDL (Reverse Spiral Dual Layer) – A storage method that uses two layers of information on one side of a DVD. For movies that are longer than can be recorded on one layer, the disc stops spinning, reverses direction, and begins playing from the next layer.

RST (Running Status Table) – Accurate and fast adaptation to a new program run if time changes occur in the schedule.

RSVP (Resource Reservation Protocol) – Defines signaling methods for IP networks to allocate bandwidth. It 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) – 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.

RTE (Residual Target Error) – A subset of the distortions measured as system target error (STE) with influences of carrier suppression, amplitude imbalance and quadrature error removed. The remaining distortions may results mainly from non-linear distortions.

RTF (Rich Text File) – A standard method of encoding text and graphics using only 7-bit ASCII characters, The format includes font sizes, type faces, and styles as well as paragraph alignment, justification, and tab control.

RTP (Real-Time Protocol) – 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, QuickTime, etc. Implementing time reconstruction, loss detection, security and content identification, 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. RTP is designed to work in conjunction with RTCP.

RTSP (Real-Time Streaming Protocol) – 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.

RTV (Real Time Video) – Single step compression of video.

Run – The number of zero coefficients preceding a non-zero coefficient, in the scan order. The absolute value of the non-zero coefficient is called "level".

Run Length Coding – a) A type of data compression where a string of identical values is replace by codes to indicate the value and the number of times it occurs. Thus a string of 70 spaces can be replaced by two bytes. One byte indicates the string consists of spaces and one byte indicates there are 70 of them. Run length coding is not as efficient as DCT for compression of pictures or video, since long sequences of the same values rarely exist in images. Run length coding is part of JPEG, MPEG, H.261, and H.263 compression schemes. **b)** A coding scheme that counts the number of similar bits instead of sending them individually. **c)** Coding of data with different numbers of bits. Frequently reoccurring data has the smallest number of bits, data seldom reoccurring have the highest number of bits.

Run-Length Encoding – A compression scheme. 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 of duplications in the run.

Rushes – See Dailies.

RVLC (Reversible Variable Length Coding) – Replaces the Huffman and DPCM coding of the scale factors of an AAC (advanced audio coding) bitstream. The RVLC uses symmetric codewords to enable forward and backward coding of the scale factor data. In order to have a starting point for backward decoding, the total number of bits of the RVLC part of the bitstream is transmitted.

R-Y – The human visual system has much less acuity for spatial variation of color than for brightness. Rather than conveying RGB, it is advantageous to convey luma in one channel, and color information that has had luma removed in the two other channels. In an analog system, the two color channels can have less bandwidth, typically one-third that of luma. In a digital system each of the two color channels can have considerably less data rate (or data capacity) than luma. Green dominates the luma channel: about 59% of the luma signal comprises green information. Therefore it is sensible, and advantageous for signal-to-noise reasons, to base the two color channels on blue and red. The simplest way to remove luma from each of these is to subtract it to from the difference between a primary color and luma. Hence, the basic video color-difference pair is B-Y, R-Y (pronounced “B minus Y, R minus Y”). The B-Y signal reaches its extreme values at blue (R=0, G=0, B=1; Y=0.114; B-Y=+0.886) and at yellow (R=1, G=1, B=0; Y=0.886; B-Y=-0.886). Similarly, the extreme of R-Y, +-0.701, occur at red and cyan. These are inconvenient values for both digital and analog systems. The color spaces YPbPr, YCbCr, PhotoYCC and YUV are simply scaled versions of Y, B-Y, R-Y that place the extreme of the color difference channels at more convenient values. The R-Y signal drives the vertical axis of the vectorscope.

▶ S

S/F – Sound over film, meaning the film is silent and sound will come.

S/N (Signal/Noise) – As in "s/n ratio".

S/PDIF (Sony/Philips Digital Interface Format) – A consumer version of the AES/EBU digital audio interconnection standard. The format uses a 75-ohm coaxial cable with RCA connectors and has a nominal peak-to-peak value of 0.5V. The frame ordering differs slightly than that of AES/EBU, specifically in the channel status information. Refer to AES/EBU interface.

SA (Scientific-Atlanta) – A leading global manufacturer and supplier of products, systems and services that help operators connect consumers with a world of integrated, interactive video, data and voice services.

SAA (Standards Australia) – An internationally recognized leader in the facilitation of standardization solutions where the collective expertise of stakeholders can enhance Australia's economic efficiency, international competitiveness and, the community's expectations for a safe and sustainable environment.

SABC (South Africa Broadcasting Corporation) – The SABC is a national public service broadcaster bringing South Africa (and Africa) world-class entertainment, education and information.

SADCT (Shape-Adaptive Discrete Cosine Transform) – The SADCT is a separable and orthogonal transform technique capable of transforming real valued two-dimensional (2D) data contained in 2D segments of arbitrary shape into a 2D DCT transform domain.

Safe Action Area – This amounts to about 90% of the total picture area. It is symmetrically located inside of the picture border. Home sets are overscanned. The entire picture isn't seen, the edges being lost beyond the border of the screen. Safe action area is designated as the area of the picture that is "safe" to put action that the viewer needs to see.

Safe Area – This allows the material positioning of video images to be checked. Both safe title and safe action boundaries are included. This signal can be keyed by any switcher or special effects generator that incorporates the luminance keying function.

Safe Color Limiting – The process of adjusting color values in a finished program so that they meet broadcast standards for luminance, composite signal or RGB gamut.

Safe Title Area – Generally, the center 80% of the entire overscan video image area or that area which will display legible titles regardless of how a TV monitor is adjusted.

Safe Title Area – The area that comprises the 80% of the TV screen measured from the center of the screen outward in all directions. The safe title area is the area within which title credits, no matter how poorly adjusted a monitor or receiver may be, are legible.

Safety Film – A photographic film whose base is fire-resistant or slow burning. At the present time, the terms "safety film" and "acetate film" are synonymous.

Sample – a) To obtain values of a signal at periodic intervals. **b)** The value of a signal at a given moment in time.

Sample and Hold – A circuit that samples a signal and holds the value until the next sample is taken.

Sample Data – The media data created by recording or digitizing from a physical source. A sample is a unit of data that the recording or digitizing device can measure. Applications can play digital sample data from files on disk.

Sample Plot – The representation of audio as a sample waveform.

Sample Rate – Sample rate is how often a sample of a signal is taken. The sample rate is determined by the sample clock.

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

Sample Unit – A unit of measure used in recording or digitizing media data from a physical source, such as a videotape. Media data contains its own sample rate and the size of each sample in bytes.

Sampled Data – Sampled data is that in which the information content can be, or is, ascertained only at discrete intervals of time. Note: Sampled data can be analog or digital.

Samples Per Picture Width – In a digital video system, the number of pixels corresponding to the reference picture width. Some pixels at the borders of the picture region may be corrupted by the picture blanking transitions and by the effects of post-production image processing. Currently, SMPTE 260M defines a clean aperture within the production aperture, confining visible artifacts around the image to a thin border.

Sampling – a) Process where analog signals are measured, often millions of times per second for video, in order to convert the analog signal to digital. The official sampling standard definition television is ITU-R 601. For TV pictures 8 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. **b)** The process of dealing with something continuous in discrete sections. Sampling is probably best known as the first step in the process of digitization, wherein an analog (continuous) signal is divided into discrete moments in time. Yet, even analog television signals have already been sampled twice: once temporally (time being sampled in discrete frames) and once vertically (the vertical direction being divided into discrete scanning lines). If these initial sampling processes are not appropriately filtered (and they rarely are in television), they can lead to aliases. See also Alias, Digitization, and Nyquist.

Sampling Frequency – The number of discrete sample measurements made in a given period of time. Often ex-pressed in megahertz for video. These samples are then converted into digital numeric values to create the digital signal.

Sampling Rate – The number of samples per unit time taken from an analog signal during analog-to-digital conversion.

Sampling, Orthogonal – In digital video, the sampling is orthogonal if the luminance and color-difference samples are generated from pixels arranged in common, continuous vertical and horizontal lines on a rectilinear grid that remains constant field/frame to field/frame.

Sampling, Quincunx – a) In a digital video system, the sampling is quincunx if the luminance and color-difference samples are generated from pixels arranged on one of two congruent rectilinear grids, the one being displaced horizontally from the other by half the horizontal pixel spacing. The alternate grid is usually chosen for alternate lines, but may instead be chosen for alternate field/frames. **b)** In a digital video system, a sampling structure with an array of samples wherein alternate rows of pixel samples are displaced horizontally in the grid by half of the pitch of the pixel samples along the remaining rows.

SANZ (Standards Association of New Zealand) – A national standard body where experts from industry and universities develop standards for all kinds of engineering problems.

SAP – See Secondary Audio Program.

SAR (Segmentation and Re-Assembly) – The protocol that converts data to cells for transmission over an ATM network. It is the lower part of the ATM Adaption Layer (AAL), which is responsible for the entire operation.

Sarnoff, David – As general manager, president, and chair of the board of RCA, he strongly shaped the future of television; also the David Sarnoff Research Center named for him, currently part of SRI International, formerly RCA Laboratories, home of ACTV research and development.

SAS (Subscriber Authorization System) – Subsystem of the CAS (Conditional Access System) that generates the EMM for the user smart cards.

SAT – See Saturation.

Satellite – Communications device located in geostationary orbit which receives transmissions from earth and retransmits them to different parts of the globe.

Satellite Mode – Recording using LTC timecode of live events, multicamera shows, and video material coming in on routers. Allows you to record to the NewsCutter system from multiple external sources at the same time they are recording to tape.

Saturated Color – A color as far from white, black, or gray as it can be (e.g., vermilion rather than pink).

Saturation – a) The property of color which relates to the amount of white light in the color. Highly saturated colors are vivid, while less saturated colors appear pastel. For example, red is highly saturated while pink is the same hue but much less saturated. **b)** In signal terms, saturation is determined by the ratio between luminance level and chrominance amplitude. It should be noted that a vectorscope does not display saturation: the length of the vectors represents chrominance amplitude. In order to verify that the saturation of the colors in a color bar signal is correct, you must check luminance amplitudes with a waveform monitor in addition to observing the vectors. **c)** The amount of gray, as opposed to hue, in a color. **d)** Limiting a value that exceeds a defined range by setting its value to the maximum or minimum of the range as appropriate. See Hue.

Saturation Flux Density, BS – The maximum intrinsic flux density possible in a sample of magnetic material. The intrinsic flux density asymptotically approaches the saturation flux density as the magnetizing field strength is increased. A magnetizing field strength in excess of 5000 Oersted is necessary to obtain an accurate measure of the saturation flux density of a typical tape.

Saturation Moment – The maximum magnetic moment possible in a sample of magnetic material.

Saturation Noise – The noise arising when reproducing a uniformly saturated tape. This is often some 15 dB higher than the bulk erased noise and is associated with imperfect particle dispersion.

SAV – See Start of Active Video.

SBE (Society of Broadcast Engineers) – SBE is a professional society for broadcast engineers and technologists.

SC (Subcommittee) – A subset of committee members organized for a specific purpose.

SCA – See Subsidiary Communications Authorizations.

Scalability – a) Scalability is the ability of a decoder to decode an ordered set of bit streams to produce a reconstructed sequence. Moreover, useful video is output when subsets are decoded. The minimum subset that can thus be decoded is the first bit stream in the set which is called the base layer. Each of the other bit streams in the set is called an Enhancement Layer. When addressing a specific Enhancement Layer, lower layers refer to the bit stream which precedes the Enhancement Layer. **b)** A characteristic of MPEG-2 that provides for multiple quality levels by providing layers of video data. Multiple layers of data allow a complex decoder to produce a better picture by using more layers of data, while a more simple decoder can still produce a picture using only the first layer of data. **c)** The degree video and image formats can be combined in systematic proportions for distribution over communications channels for varying capacities. **d)** Scalability implies that it is possible to decode just a fraction of the information in a bit stream. In MPEG we find SNR scalability, spatial scalability, and temporal scalability, and even in combination (hybrid scalability). In connection with scalability we find the terms “lower layer”, which represents the basic information, and the “Enhancement Layer”, which represents the additional information. In case of hybrid scalability, up to three layers are found. All types of scalability may be utilized for transmission systems with split data channels with different error rate. The lower layer is transmitted on a channel with high protection rate, whereas the Enhancement Layer then is transmitted on a channel with higher bit error rate. **e)** A feature of the Indeo video codec with which quality can be optimized during playback depending on the system resources being used to play the video.

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 Hierarchy – Coded audiovisual data consisting of an ordered set of more than one bitstream.

Scalable Video – With respect to Indeo video technology, it is a playback format that can determine the playback capabilities of the computer on which it is playing. Using this information, it allows video playback to take advantage of high-performance computer capabilities while retaining the ability to play on a lower performance computer.

Scalar Quantization – The mapping of a (large) number of signal levels into a smaller number of levels. The quantization may be uniform or nonlinear.

Scale Bar – A control in the timeline window that allows you to expand and contract the Timeline area centered around the blue position indicator.

Scale Factor – Value used to scale a set of values before quantization.

Scaling – a) The act of changing the effective resolution of the image. Images can be scaled down so that more images can be displayed or scaled up such that the image takes up more screen space. **b)** 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.

Scaling Moving Images – Moving images present a unique set of scaling challenges. In NTSC TV, fields alternate every 16.6 ms. Any object that moves significantly between field-refresh times will appear distorted. If an image is scaled in the Y direction by assembling two fields into a single frame, the distortion is even more exaggerated. When the full frame is scaled down using decimation (line-dropping), a group of lines from one field can end up adjacent to a group of lines from another field, causing a jagged, stepped appearance in the scaled image. This distortion is often more noticeable than the distortion in the original TV image. Therefore, a general rule for scaling down is to use either the even or odd field from each frame. If the final image is to be less than one-half the size of the original, scale the single field down to the required size. if the final image is to be greater than one-half the size of the original, use one field, then increase image to the required number of lines with line replication.

Scan Converter – a) External device that converts a computer's VGA output to video, it can be displayed on a TV or VCR. **b)** 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 Line – An individual horizontal sweep across the face of the display by the electron beam. It takes 525 of these scan lines to make up a single frame of an NTSC picture and 625 for PAL.

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 (SVM) – SVM is one of the many tricks manufacturers use to get more light out of a picture tube, at the cost of real picture detail. It changes the speed or velocity of the beam as it is scanned from the left to the right side of the picture. In the process, it distorts real picture detail, causing dark areas of the picture on light backgrounds to be reproduced much larger than normal and light areas on dark backgrounds to be reproduced much smaller than normal. When the beam spends more time "writing" light areas, the phosphors receive more energy and produce more light output. The fact that this will contribute to phosphor blooming, as well as detail distortion seems to be lost on a number of manufacturers calling it a "feature". The presence or absence of SVM can be easily detected by displaying the needle pulse test pattern. In it the width of the white line, on the black background, and black line, on the white background, are the same. In a set with SVM, the width of the black line will be much larger than the white line. If SVM is found on a set, look for an ability to turn it off. Several sets provide this option in the mode of the set designed to accurately reproduce the signal source. In some other sets, it is easily defeated by a qualified service technician.

Scanner – a) When referring to a CCTV device it is the pan only head. **b)** When referring to an imaging device, it is the device with CCD chip that scans documents and images.

Scanner, Motion-Picture Film – a) A device for scanning photographic motion-picture images and transcoding them into an electronic signal in one of the standardized or accepted video formats. **b)** Film scanner is a general term, and may be applied to slow-rate as well as real-time transcoding, and may provide the input to a recorder, a signal processor, a transmission channel, or any other desired peripheral system.

Scanning – The process of breaking down an image into a series of elements or groups of elements representing light values and transmitting this information in time sequence.

Scanning Circuitry – Camera or display subsystems designed for moving an electron beam around to form a raster.

Scanning Lines – a) A single, continuous narrow strip of the picture area containing highlights, shadows and half-tones, determined by the process of scanning. **b)** Horizontal or near-horizontal lines sampling a television image in the vertical direction. In tube-type cameras and displays equipped with CRTs, the scanning lines are caused by electron beam traces.

Scanning Lines Per Frame
525 – NTSC
625 – Most non-NTSC broadcast systems
655 – Used for electronic cinematography with 24 frames per second
675 – EIA industrial standard
729 – EIA industrial standard
750 – RCA and International Thomson progressive scanning proposal
819 – CCIR System E (used in France)
875 – EIA industrial standard
900 – International Thomson progressive scanning proposal
945 – EIA industrial standard
1001 – French progressive scanning proposal for NTSC countries
1023 – EIA industrial standard
1029 – EIA industrial standard
1049 – Double NTSC with interlaced scanning
1050 – Double NTSC with progressive scanning, French interlace proposal
1125 – ATSC/SMPTE HDEP standard
1200 – French progressive scanning proposal for non-NTSC countries
1225 – EIA industrial standard
1249 – Double non-NTSC with interlaced scanning
1250 – Double non-NTSC with progressive scanning
1501 – Early BBC proposal
2125 – Early NHK monochrome system
2625 – RCA electronic cinematography proposal

Scanning Spot – Refers to the cross-section of an electron beam at the point of incidence in a camera tube or picture tube.

Scanning Standard – The parameters associated with raster scanning of a computer display, camera, or video recorder. Denoted by the total line count, field rate, and interlace ratio.

Scanning Structure – A term sometimes used to describe a number of scanning lines per frame, interlace ratio, and frame rate; also sometimes used to describe what appears when scanning lines are visible.

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

Scanning, Interlaced – A scanning process in which the distance from center to center of successively scanned lines is two or more times the nominal line width, and in which the adjacent lines belong to different fields. For a given number of active vertical lines per frame, and a given frame-rate, interlaced scanning provides system-limited definition for still images. Moving images, however, provide reduced perceived spatial definition. Although the interlaced scanning field-rate at a multiple of the frame-rate could improve temporal resolution, this is seldom perceived. When scanning interlaced 2:1 in either capture or display mode, the lines constituting one frame of the image are scanned and/or presented in two successive fields one-half the lines in one field and the other half interleaved as the following field. In a system based upon a nominal 60 Hz, for example, the generation and presentation of the two fields in succession required a total of 1/30 sec per frame, with a continual temporal progression from start to finish of the scanning. Note: Interlaced scanning may be introduced in the original scanning for image capture, or may be developed from progressive scanning of the original.

Scanning, Progressive – a) A rectilinear scanning process in which the distance from center to center of successively scanned lines is equal to the nominal line width. **b)** A display mode for electronic imaging in which all of the scanned lines are presented successively, and each field has the same number of lines as a frame. Also known as sequential scanning. For a given number of active vertical lines per frame, and a given frame rate, progressive scanning requires the same bandwidth as interlaced scanning. When compared at a given field rate, progressive scanning requires twice the bandwidth of 2:1 interlaced scanning. Note: Most image processing in electronic post-production requires that a progressive scanned image first be captured or created. The image information may have originated in progressive scanning, or it may have been interpolated from an origination in interlaced scanning.

Scanning, Sequential – See Scanning, Progressive.

SCART – See Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs.

Scene – a) A collection of entities that can change over time. **b)** An image window view in DVE in which you can see and manipulate objects, axes, lights and the camera.

Scene Coding – A representation of audiovisual objects that makes use of scalability.

Scene Complexity – The intrinsic difficulty of the image sequence to code. For example, the "talking head" video sequences which occurs often in video conferencing applications are much easier to code than an action-filled movie for entertainment applications.

Scene Description – Information that describes the spatio-temporal positioning of media objects as well as their behavior resulting from object and user interactions.

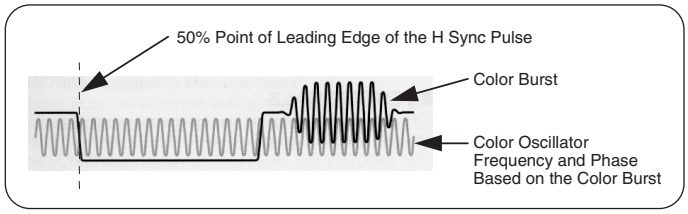
Scene Description Profile – A profile that defines the permissible set of scene description elements that may be used in a scene description stream.

Scene Description Stream – An elementary stream that conveys BIFS (Binary Format for Scenes) scene description information.

Scene Illumination – The average light level incident upon a protected area. Normally measured for the visible spectrum with a light meter having a spectral response corresponding closely to that of the human eye and is quoted in lux.

SCFSI (Scale Factor Selection Information)

SCH Phase (Subcarrier to Horizontal Phase) – This is a measurement of the color oscillator frequency and phase as set by the color burst in relation to the 50% point on the leading edge of the horizontal sync pulse.



Schematic View – An illustration in DVE that depicts the different relationships between objects and layer.

Schmidt Trigger – Circuit with hysteresis used for input signals that are noisy or have slow transition times.

Scientific-Atlanta – CATV, satellite transmission, and production equipment firm that has been selling B-MAC equipment for years and is a proponent of the HDB-MAC ATV scheme.

SCMS (Serial Copy Management System) – Used by DAT, MiniDisc, and other digital recording systems to control copying and limit the number of copies that can be made from copies.

Scope – Short for oscilloscope (wave-form monitor) or vectorscope, devices used to measure the television signal.

Scotopic Vision – Illumination levels below 10-2 lux, thus invisible to the human eye.

SCPC (Single Channel Per Carrier) – Type of transmission where only a part of the available transponder is used for the signal, allowing the satellite operator to sell the remaining space on the transponder to other uplinkers. SCPC is typically used for feeds rather than for direct programming. The advantage of SCPC over MCPC (Multi-Channel Per Carrier) is that the signals uplinked to the same transponder can be transmitted up to the satellite from different locations.

SCR (System Clock Reference) – a) Reference in PS (Program Stream) for synchronizing the system demultiplex clock in the receiver, transmitted at least every 0.7 sec. Integrated into PES (Packetized Elementary Stream). **b)** A time stamp in the program stream from which decoded timing is derived.

Scramble – A distortion of the signal rendering a television picture unviewable or inaudible. A descrambler (or decoder) renders the picture viewable upon service provider's authorization.

Scrambling – a) Usually used as a synonym for encryption, controlled disordering of a signal to prevent unauthorized reception. **b)** Sometimes used to describe controlled disorganization of a signal to improve its robustness. This form is more often called shuffling. **c)** 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. **d)** The digital signal is shuffled to produce a better spectral distribution. **e)** The alteration of the characteristics of a video, audio, or coded data stream in order to prevent unauthorized reception of the information in a clear form. This alteration is a specified process under the control of a conditional access system.

Scratch Disks – The user-defined hard disk location where an application stores temporary and preview files.

Scratching – Gouging of the magnetic layer or base as the tape passes through a machine. Videotape scratches will cause a loss of head-to-tape contact and appear as a solid line on your screen.

Scratchpad – Memory containing intermediate data needed for final results.

Screen – The portion of the monitor that displays information. The face of a monitor, TV or terminal.

Screen Illumination – The density of light falling on the area to be viewed. For best results the ratio of the lightest to the darkest areas should not be more than a factor of two.

Screen Splitter – A term usually used for a device that can combine the views from two cameras on a single screen. Normally the camera syncs need to be locked together.

Screening – A showing of a film program, video program or raw footage.

Screw Assembly – Refers to the method of joining of the two plastic parts of a cassette with screws, as opposed to sonically welding.

Script – A sequence of statements that conforms to a scripting language.

Scripting Language – A programming language that can be interpreted and that is in general dedicated to a particular purpose.

Scroll – Graphics that roll from the bottom to the top of the screen, for example, end credits.

Scroll Bar – A rectangular bar located along the right side or the bottom of a window. Clicking or dragging in the scroll bar allows the user to move or pan through the file.

Scrubbing – The backward or forward movement through audio or video material via a mouse, keyboard, or other device.

SCSI (Small Computer System Interface) – a) Special type of disk drive designed for moving very large amounts of information as quickly as possible. **b)** A very widely used high data rate general purpose parallel interface. A maximum of eight devices can be connected to one bus, for example a controller, and up to seven disks or devices of different sorts, Winchester disks, optical disks, tape drives, etc., and may be shared between several computers. SCSI specifies a cabling standard (50-way), a protocol for sending and receiving commands and their format. It is intended as a device-independent interface so the host computer needs no details about the peripherals it controls. But with two versions (single-ended and balanced), two types of connectors and numerous variations in the level of implementation of the interface, SCSI devices cannot "plug & play" on a computer with which they have not been tested. Also, with total bus cabling for the popular single-ended configuration limited to 18 feet (6 meters), all devices must be close to each other.

SCSI Address – A number from one to seven that uniquely identifies a SCSI device to a system. No two SCSI devices that are physically connected to the same workstation can have the same SCSI address.

SCSI Address Dial – A small plastic dial connected to every SCSI device supplied by Silicon Graphics, Inc. You click on its small buttons to select a SCSI address for a new SCSI device. Each device on a SCSI bus normally should have a unique address.

SCSI Bus Line – The combined length of all internal and external SCSI cables in a system.

SCSI Cable – A cable that connects a SCSI device to a SCSI port on a workstation.

SCSI Device – A hardware device that uses the SCSI protocol to communicate with the system. Hard disk, floppy disk, CD-ROM, and tape drives may be SCSI devices.

SCSI Terminator – A metal cap that you plug into any open SCSI port on a SCSI bus line. No SCSI devices on a SCSI bus line will work unless all SCSI ports are occupied by either a cable or terminator.

SCSI, Differential – An electrical signal configuration where information is sent simultaneously through pairs of wires in a cable. Information is interpreted by the difference in voltage between the wires. Differential interfaces permit cable lengths up to 75 feet (25 meters).

SCSI, Single-Ended – An electrical signal configuration where information is sent through one wire in a cable. Information is interpreted by the change in the voltage of the signal relative to two system ground. Single-ended interfaces permit cable lengths up to 18 feet (6 meters).

SD (Super Density) – A proposal for an optical disc format from Toshiba, Time Warner and an alliance of several other manufacturers. The SD format is now integrated in the DVD format.

SDDI – See Serial Digital Data Interface.

SDDS (Sony Dynamic Digital Sound) – A digital audio encoding system used in movie theaters since 1993. The SDDS sound track is recorded optically as microscopic pits similar to a CD along both outer edges of the 35 mm 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.

SDH (Synchronous Digital Hierarchy) – ITU standard for transmission in synchronous optical networks. Used in rest of world outside of North America where SONET is used.

SDI (Serial Digital Interface) – A physical interface widely used for transmitting digital video, typically D1. It uses a high grade of coaxial cable and a single BNC connector with Teflon insulation.

SDL (Specification and Description Language) – A modeling language used to describe real-time systems. It is widely used to model state machines in the telecommunications, aviation, automotive and medical industries.

SDLC (Synchronous Data Link Control) – The primary data link protocol used in IBM's SNA networks. It is a bit-oriented synchronous protocol that is a subset of the HDLC protocol.

SDMI (Secure Digital Music Initiative) – Efforts and specifications for protecting digital music.

SDP (Severely Disturbed Period)

SDT (Service Description Table) – A table listing the providers of each service in a transport stream. The SDT contains data describing the services in the system, i.e., include: names of services, the service provider, etc.

SDTI (Serial Digital Transport Interface) – SMPTE 305M. Allows faster-than-real-time 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 real time compressed video transfer rates in the 18 Mbps to 25 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 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 is coming as well as line counts and CRCs to check data continuity.

SDTV (Standard Definition Television) – a) The new HDTV standards call for a range of different resolutions. Those that are higher than today's NTSC are considered HDTV. The ones that are comparable to NTSC are considered SDTV. Because SDTV is component and digital it will still be higher quality than NTSC. **b)** This term is used to signify a digital television system in which the quality is approximately equivalent to that of NTSC. Also called standard digital television. See also Conventional Definition Television and ITU-R Recommendation 1125.

SDU – See Service Data Unit.

Seam Elimination – Techniques to make picture panel seams invisible.

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

Seams – Vertical lines in the picture where separately transmitted widescreen panels are joined to the center of the image. CBS proved that seams could be made invisible in its two-channel ATV transmission scheme.

Search Pattern – See Region of Interest.

SECAM – See Sequential Color and Memory.

Secondary Audio Program (SAP) – An audio track(s) separate from the normal program audio. This second tack is commonly used to transmit a second language but may be used for other purposes.

Secondary Color Correction – Color correction that applies to specific parts of an image defined by hue and saturation values. A secondary color correction can change the green parts of an image to yellow without altering other colors in the image. See also primary color correction.

Secondary Distribution – The links that radiate from the cable TV head-end, or the path from a satellite up-link and beyond, or a link directly feeding TVs in the homes.

Section – A table is subdivided into several sections. If there is a change, only the section affected is transmitted.

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

Sector Information – Header field providing the sector number.

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

SEDAT (Spectrum Efficient Digital Audio Technology) – A proprietary audio compression algorithm from Scientific-Atlanta, used for satellite links.

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

SEG (Special Effects Generator) – Device designed to generate special effects. The simplest devices process a single video signal, change its color, generate sepia tones, invert the picture to a negative, posterize the image and fade or break up the image into various patterns. More sophisticated equipment uses several video sources, computer-generated graphics and sophisticated animation with digital effects.

Segment – A section of a track or clip within a sequence in the timeline that can be edited.

Segment Marker – A marker indicating the segment ends on curves.

Segmentable Logical Channel – A logical channel whose MUX-SDUs may be segmented. Segmentation allows the temporary suspension of the transmission of a MUX-SDU in order to transmit bytes from another MUX-SDU.

Select – To position the cursor over an icon then click the (left) mouse button. (To select an option button.) Once an icon is selected, it is the object of whatever operation you select from a menu.

Self Fill Key – A key which is filled with the same video that was used to cut the hole for the key.

Self Key – A key effect in which a video signal serves as both the key source and fill.

Self-Contained – In PC video, a MooV file that contains all of its video and audio data, instead of including references to data in other files. See MooV.

Self-Demagnetization – The process by which a magnetized sample of magnetic material tends to demagnetize itself by virtue of the opposing fields created within it by its own magnetization. Self-demagnetization inhibits the successful recording of short wavelengths or sharp transitions in a recorded signal.

Self-Erasure – The erasure of high frequencies which occurs during recording due to the formation of a secondary gap after the trailing edge of the record head. Self-erasure is increased by excess bias and by excess high frequency signal levels (especially at low tape speeds).

Self-Test – Test performed by a product on itself.

SelSync – A configuration which enables the engineer to play back the signal from the record head for use in overdubbing.

SelSync Bias Trap – A control used to remove bias signal from adjacent recording heads which can leak into the record head being used to play back a signal.

SelSync Gain – A control used to equalize the gain of SelSync playback from the record head with the gain of playback from the reproduce head.

Sensitivity – a) The magnitude of the output when reproducing a tape recorded with a signal of given magnitude and frequency. The sensitivity of an audio or instrumentation tape is normally expressed in dB relative to the sensitivity of a reference tape measured under the same recording conditions. **b)** The amount of signal a camera can emit from a particular sensor illumination at a particular SNR, sometimes expressed as a certain scene illumination (in lux or foot-candles) at an assumed reflection and signal strength, at a particular lens transmission aperture, at a particular SNR. The sensitivity of a camera can be truly increased by improving its image sensor, increasing its transmission aperture, or slowing its frame rate; it can be seemingly increased by allowing the SNR to be reduced. All other things being equal, at this time the sensitivity of an HDEP camera is less than the sensitivity of an NTSC camera. The sensitivity of first-generation HDTV 1125 scanning-line cameras is two to three stops less sensitive than that of a 525-line camera (needing four to eight times as much light). HARP tubes and new CCD advances may offer a solution to this problem.

Sensitometer – An instrument with which a photographic emulsion is given a graduated series of exposures to light of controlled spectral quality, intensity, and duration. Depending upon whether the exposures vary in brightness or duration, the instrument may be called an intensity scale or a time scale sensitometer.

SEP (Symbol Error Probability)

Separation – The degree to which two channels of a stereo signal are kept apart.

Separation Loss – The loss in output that occurs when the surface of the coating fails to make perfect contact with the surfaces of either the record or reproduce head.

Sepia Tone – A process used in photography to generate a brownish tone in pictures giving them an "antique" appearance. The same idea has been electronically adapted for video production where a black and white image can be colored in sepia.

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.

Sequential Color and Memory (Sequential Couleur avec Memoire) – a) French developed color encoding standard similar to PAL. The major differences between the two are that in SECAM the chroma is frequency modulated and the R'-Y' and B'-Y' signals are transmitted line sequentially. The image format is 4:3 aspect ratio, 625 lines, 50 Hz and 6 MHz video bandwidth with a total 8 MHz of video channel width. **b)** A composite color standard based upon line-alternate B-Y and R-Y color-difference signals, frequency modulated upon a color subcarrier. All applications are in 625/50/2:1 systems.

Sequential Logic – Circuit arrangement in which the output state is determined by the previous state and the current inputs. Compare with Combinational Logic.

Sequential Scanning – Progressive scanning, so named because scanning lines are transmitted in numerical sequence, rather than in odd- or even-numbered fields, as in interlaced scanning.

SER (Symbol Error Rate) – Similar to the BER concept, but instead refers to the likelihood of mistake detection on the digital modulation symbols themselves, which may encode multiple bits per symbol.

Serial Control – A method of remotely controlling a device via a data line. The control data is transmitted in serial form (that is, one bit after another).

Serial Data – Time-sequential transmission of data along a single wire. In CCTV, the most common method of communicating between keyboards and the matrix switcher and also controlling PTZ cameras.

Serial Device – Any hardware device that requires a serial connection to communicate with the workstation.

Serial Device Control – Most professional video equipment can be controlled via an RS-232 or RS-422 serial port. The protocols used for controlling these devices varies from vendor to vendor, however, Sony's protocol is supported by most editing systems.

Serial Digital – Digital information that is transmitted in serial form Often used informally to refer to serial digital tele-vision 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 Video – Uses scrambled channel coding and NRZI signal format as described in SMPTE 259M and EBU Tech. 3267. The various serial digital data rates are: 143 Mbps for serial composite NTSC; 177 Mbps for serial composite PAL; 270 Mbps for serial component 525/59.94 and 625/50; 360 Mbps for serial component 16:9 aspect ratio.

Serial HDDR – The recording of a digital data stream onto a single recording track. With multitrack recorders, multiple streams can be recorded as long as each stream is recorded on a separate track. There is no requirements that multiple streams have a common synchronous clock nor is it required that the multiple streams be the same recording code.

Serial Interface – An option to switcher which allows all switcher functions to be controlled remotely by a computer editor. Data is transmitted serially between the editor and the switcher at selectable baud (transmission) rates.

Serial Port – a) A computer I/O (input/output) port through which the computer communicates with the external world. The standard serial port uses RS-232 or RS-422 protocols. **b)** An outlet on a workstation to which you connect external serial devices.

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 Timecode – See LTC.

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 digital.

Serration Pulses – Pulses that occur during the vertical sync interval, at twice the normal horizontal scan rate. These pulses ensure correct 2:1 interlacing and eliminate the buildup of DC offset.

Serrations – This is a term used to describe a picture condition in which vertical or nearly vertical lines have a sawtooth appearance. The result of scanning lines starting at relatively different points during the horizontal scan.

Server – Entity that provides multimedia content and services.

Server, 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 at least a few kilobytes in size and are expected to be delivered within moments of request.

Server, Video – A storage system that provides audio and video storage for a network of clients. While there are some analog systems based on optical disks, most used in professional and broadcast applications are based on digital disk storage. Aside from those used for video on demand (VOD), 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 channels, compression ratio and degree of access to stored material, the latter having a profound influence. Store sizes are very large, typically up to 500 gigabytes or more. Operation depends entirely on connected devices, edit suites, automation systems, secondary servers, etc., so the effectiveness of the necessary remote control and video networking is vital to success.

Service – A set of elementary streams offered to the user as a program. They are related by a common synchronization. They are made of different data, i.e., video, audio, subtitles, other data.

Service Data Unit (SDU) – A logical unit of information whose integrity is preserved in transfer from one protocol layer entity to the peer Protocol Layer entity.

Service Information (SI) – Digital data describing the delivery system, content and scheduling/timing of broadcast data streams, etc. It includes MPEG-2 PSI together with independently defined extensions.

service_id – A unique identifier of a service within a TS (Transport Stream).

Servo – In cameras, a motorized zoom lens. Originally a brand name, servo is now a generic name for any motor-controlled zoom lens. A servo is usually operated by pressing buttons labeled "T" (telephoto) and "W" (wide-angle) on the video camera's hand grip.

Servo System – An electrical device controlling the speed of a moving or rotating device such as a capstan/pinchroller rotating speed.

SES (Seriously Errored Second)

Session – The (possibly interactive) communication of the coded representation of an audiovisual scene between two terminals. A unidirectional session corresponds to a single program in a broadcast application.

Set – A studio or part thereof which has a particular function (i.e., news) and hence includes all props, desks, etc.

Set Top Box – A set top device that is a digital receiver. It receives, decompresses, decrypts and converts satellite, cable, terrestrial transmitted digital media signals for playback on a TV or monitor.

Set/Trim In, Set/Trim Out – Function of entering edit in- and out-points in the time-code format. Preceding the numeric entry with a + or – adds to or subtracts from already existing edit points.

Settling Time – Settling time is the time it takes the output analog signal of a DAC to attain the value of the input data signal. This time (usually measured in nanoseconds) is measured from the 50% point of full-scale transition to within +/- 1 LSB of the final value.

Setup – a) Typically 7.5 IRE above the blanking level. In NTSC systems, this 7.5 IRE level is referred to as the black setup level, or simply setup. **b)** The ratio between reference black level and reference white level, both measured from blanking level. It is usually measured in percent. Black level reference expressed as a percentage of the blanking-to-reference-white excursion. Conventionally 7.50% in system M, conforming to ANSI/EIA/TIA 250-C. Conventionally zero in all other systems where blanking level and black level reference are identical.

Setup Files – Customized menus, filters, settings, etc., that you create and can save in UNIX to reuse during work sessions.

Setup Mode – The functional level in which you can program the system's baud rate, parity, and bus address to match the communications standards of an external editor.

Set-Up Time – Time that data must be stable prior to a write signal.

SFDMA (Synchronous Frequency Division Multiple Access) – For the direct channel from the broadcaster to the user, the European COFDM standard was used, while the return channel was realized using an innovative technique called SFDMA (synchronous frequency division multiple access). This technique uses a combination of time division multiple access (TDMA) and frequency division multiple access (FDMA) to transmit users and MAC data to the broadcasting station.

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

SFN (Single Frequency Network) – A TV transmitter network in which all the transmitters use the same frequency. The coverage areas overlap. Reflections are minimized by guard intervals. The transmitters are separated by up to 60 km. The special feature of these networks is efficient frequency utilization.

SFP (Societe Francaise de Production et de Creation Audiovisuelles) – Drafter of the French proposals.

Shading – In order to look solid, a polygon must be "shaded" with color. This happens when the polygon is rendered. There are several ways to shade a polygon. These have varying degrees of realism and cost. A polygon's shading depends on its surface properties, the properties and location of the lights with which it is lit. The shading methods (types) available on PictureMaker are constant, flat, Gouraud, and Phong. The latter two are "smooth" shading types.

Shadow – A type of key border effect. A shadow key with a character generator appears as if the letters have been raised off the surface slightly and a light is shining from the upper left; a shadow appears to the right and bottom of the characters.

Shadow Chroma Key – The ability to key a subject as a regular chroma key, while using the border channel of the keyer to mix in the low luminance portions of the key signal. This allows a true shadow effect where any shadow in the key video appears as if it is in the background. All Ampex switchers have this feature, with variable shadow levels and densities (bdr adj and bdr lum respectively).

Shadow Mask – A perforated metal plate which is mounted close to the inside of a color CRT display surface. This plate causes the red, green and blue electron beams to hit the proper R, G, or B phosphor dots.

Shannon's Theorem – A criterion for estimating the theoretical limit to the rate of transmission and correct reception of information with a given bandwidth and signal-to-noise ratio.

Shared Volume Segmentation – See Chunking.

Sharpness – a) Apparent image resolution. High sharpness may be the result of high resolution, or it might be an optical illusion caused by image enhancement or by visible edges in a display, such as the vertical stripes of an aperture grille CRT (e.g., Trinitron). Visible scanning lines can actually increase perceived sharpness. This may be one reason why, in some subjective ATV tests, some viewers have expressed a preference for NTSC pictures over ATV. **b)** Sharpness is the casual, subjective evaluation of detail clarity in an image. It is often assumed that sharpness and resolution are directly related, in that images possessed of greater sharpness are assumed to have greater resolution. An increase in subjective sharpness is usually reported when objects are more clearly delineated from each other and from background having hard, sharply-defined edges. A major contribution to subjective sharpness is this high contrast at edge transitions, as is emphasized by both edge enhancement and aperture correction, for example. In many practical systems, increasing the contrast at edge transitions is often accompanied by a reduction in fine detail, and under these conditions sharpness and resolution may describe opposite characteristics.

Shedding – A tape's giving off of oxide or other particles from its coating or backing, usually causing contamination of the tape transport and, by redeposit, on the tape itself.

Shelf – The effect produced by a shelving equalizer in which the response curve for a certain range of the frequency spectrum (high or low frequency, for example) flattens out or "shelves" at the limits of the audio spectrum. In audio equalization, adjustments to the shelf affect all frequencies within the range of the response curve.

Shell – a) The command interpreter between the user and the computer system. **b)** A window into which you type IRIX, UNIX or DOS commands.

SHF (Super High Frequency) – The band of frequencies ranging from 3 GHz to 30 GHz, currently including all communications satellite signals and most microwave transmissions. SHF has been suggested as a band to be used for terrestrial ATV transmission channels.

Shielded Cable – A cable with a conductive covering which reduces the possibility of interference with radio, television, and other devices.

Shift – To move the characters of a unit of information right or left. For a binary number, this is equivalent to multiplying or dividing by two for each shift.

Shoot and Protect – A concept of aspect ratio accommodation central to the selection of the 16:9 aspect ratio for the SMPTE HDEP standard. In a shoot and protect system, in production the action is confined to certain bounds (the shoot range) but a larger area (the protect range) is kept free of microphone booms, lights, and other distracting elements. Shoot and protect has been used for years in film, where the shoot aspect ratio is the 1.85:1 used in NTSC. The 16:9 aspect ratio was selected mathematically as the one requiring the least area to protect both 1.33:1 television and 2.35:1 widescreen film. In such a system, both the shoot and the protect aspect ratios would be 16:9. A rectangle of shoot width and protect height would be 1.33:1 (12:9); a rectangle of shoot height and protect width would be 2.35:1 (about 21:9). The concept of 3-perf film conflicts strongly with 1..85:1 shoot and protect.

Short Time Linear Distortions – These distortions cause amplitude changes, ringing, overshoot and undershoot in fast rise times and 2T pulses. The affected signal components range in duration from 125 nsec to 1 µsec. A 1T pulse must be used to test for these distortions. See the discussion on Linear Distortions. Errors are expressed in "percent-SD". The presence of distortions in short time domain can also be determined by measuring K2T or Kpulse/bar. See the discussion on K Factor. Picture effects include fuzzy vertical edges. Ringing will sometimes generate chrominance artifacts near vertical edges.

Shortwave – Transmissions on frequencies of 6-25 MHz.

Shot – a) Picture information recorded by a camera. **b)** A sequence of images and/or clips.

Shot Log – A listing of information about a roll or film or a reel of videotape, usually in chronological order.

Shotgun Microphone – Long, highly directional microphone designed to pick up sounds directly in front of the microphone, rejecting sound from other directions. Named for its appearance.

Shoulder – On the characteristic curve for a photographic material (the plot of density vs. log exposure) that portion representing nonlinear response at the higher densities. For the electronic relationship of a positive video image to the shoulder of photographic negatives.

Showscan – A film process utilizing 70 mm (65 mm in the camera) film at 60 frames per second. It seems an ideal film production format (expense considerations aside) for transfer to ATV and has been demonstrated as such.

Shut Down – To safely close all files, log out, and bring the workstation to a state where you can safely power it down.

Shuttle – A variable-rate search, forward or reverse, of a videotape using a video deck or VCR capable of such an operation.

Shuttling – The viewing of footage at speeds greater than real time.

SI (Service Information) – SI provides information on services and events carried by different multiplexes, and even other networks. SI is structured as six tables (PAT, NIT, CAT, SDT, EIT, and BAT). The applications are only concerned with NIT, BAT, SDT, and EIT.

SI (Systéme International d'Unites) – The French version of the International System of Units. A complete system of standardized units and prefixes for fundamental quantities of length, time, volume, mass, and so on. SI is roughly equivalent to the metric system.

Side Information – Information in the bit stream necessary for controlling the decoder.

Side Panels – Additional sections of picture that, when added to a television image, change a 1.33:1 aspect ratio into a wider one. Many ATV schemes transmit these panels separately from the main picture.

Sideband – A signal that is a consequence of some forms of modulation. When modulation forms two sidebands, one can sometimes be filtered out to increase efficiency without sacrificing information.

Sides (Submenu) – Under Source, the function that enables each side of the video image to be cropped.

SIF (Standard or Source Interchange Format) – A half-resolution input signal used by MPEG-1. See Standard Input Format.

Sifting – The displaying of clips that meet specific criteria in a bin.

SIGGRAPH – The Association of Computing Machinery (ACM) Special Interest Group on Computer Graphics. Internet: www.siggraph.org

Signal Amplitude – The nominal video signal amplitude shall be 1.0 volt peak-to-peak (140 IRE units).

Signal Polarity – The polarity of the signal shall be positive, i.e., so that black-to-white transition are positive going.

Signal, Chrominance – Video: The color-difference signal(s) and the equation(s) for their derivation. Color Television: The sidebands of the modulated chrominance subcarrier that are added to the luminance signal to convey color information.

Signal, Luminance – Video: The signal that describes the distribution of luminance levels within the image and the equation for deriving that information from the camera output. Television, **Composite Color:** A signal that has major control of the luminance. Note: The signal is a linear combination of gamma-corrected primary color signals.

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.

Signal-to-Noise Ratio (SNR) – a) The ratio of signal to noise expressed in dB. In general, the higher the signal to noise ratio the better. If there is a low signal-to-noise ratio, the picture can appear grainy, snowy and sparkles of color maybe noticeable. Equipment will not be able to synchronize to extremely noisy signals. **b)** It may not be possible to directly compare SNRs for ATV and for NTSC as the eye's sensitivity to noise varies with the detail of the noise. **c)** The measurement of the dynamic range of a piece of equipment, measuring from the noise floor (internally generated noise) to the normal operating level or the level prior to limiting.

Signature – Four-digit value generated by a signature analyzer, which is used to characterize data activity present on a logic node during a specific period of time.

Signature Analysis – Technique used to facilitate the troubleshooting of digital circuits. Nodes of the circuit, stimulated during a test mode, produce "signatures" as the result of the data compression process performed by the signature analyzer. When a node signature is compared to a known good documented signature, faulty nodes can be identified.

Signature Analyzer – Instrument used to convert the long, complex serial data streams present on microprocessor system nodes into four-digit signatures.

Silence – Blank (black) space in the audio tracks in a timeline that contains no audio material.

Silent Radio – A service that feeds data that is often seen in hotels and nightclubs. It's usually a large red sign that shows current news, events, scores, etc. It is present on NTSC lines 10- 11 and 273-274, and uses encoding similar to EIA-608.

Silhouette – In a boundary rep system, the typical method for creating a solid begins by drawing a silhouette outline of it; a plan view (in architectural terminology).

Silicon – The material of which modern semiconductor devices are made.

SIMM (Single In-Line Memory Module) – A small printed circuit board with several chips that contain additional megabytes of random-access memory (RAM).

SIMM Removal Tool – An L-shaped metal tool used to loosen SIMMs that are installed in the SIMM socket.

SIMM Socket – A long, thin, female connector located on the CPU board into which you insert a SIMM.

Simple Profile (SP) – a) 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. **b)** A subset of the syntax of the MPEG-2 video standard designed for simple and inexpensive applications such as software. SP does not allow B pictures.

Simple Scalable Visual Profile – Adds support for coding of temporal and spatial scalable objects to the Simple Visual Profile. It is useful for applications which provide services at more than one level of quality due to bit rate or decoder resource limitations, such as Internet use and software decoding.

Simple Surface – Consists of a regular patch mesh and is created with a single surface creation operation such as extrude, revolve, sweep, and smooth lofts.

Simple Visual Profile – Provides efficient, error-resilient coding of rectangular video objects, suitable for applications on mobile networks, such as PCS and IMT2000.

Simplex – a) Transmission in a one-way only connection. **b)** In general, it refers to a communications system that can transmit information in one direction only. In CCTV, simplex is used to describe a method of multiplexer operation where only one function can be performed at a time, e.g., either recording or playback individually.

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

Simulation – A technique for trying an ATV scheme inside a computer without actually building specialized equipment. Some question the validity of ATV simulations.

Simulator – Special program that simulates the logical operation of the microprocessor. It is designed to execute machine language programs on a machine other than the one for which the program is written. This allows programs for one microprocessor to be debugged on a system that uses another processor.

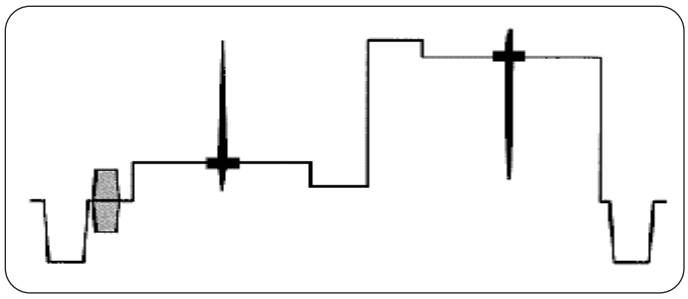
Simulcast (Simultaneous Broadcast) – Prior to the advent of multichannel television sound broadcasting, the only way to transmit a stereo television show to homes was by simultaneous broadcasting on TV and radio stations. Proponents of non-receiver compatible ATV schemes suggest the same technique to achieve compatibility with existing NTSC TV sets: The non-compatible ATV signal will be transmitted on one channel and a second channel will carry a standards-converted NTSC signal. It is sometimes suggested that such simulcast techniques of ATV transmission are more efficient than augmentation techniques since, when the penetration of ATV sets into households reaches some limit, the NTSC simulcast channel can be eliminated, conserving bandwidth. In Britain, an almost identical situation occurred when 625 scanning-line television replaced 405. For many years, all programming was simulcast in both line rates with 405 eventually eliminated.

SimulCrypt – a) DVB SimulCrypt addresses specifically the requirements for interoperability between two or more CA systems at a headend. **b)** A process that facilitates using several conditional access (CA) systems in parallel, in conjunction with the DVB common scrambling algorithm, to control access to pay-TV services.

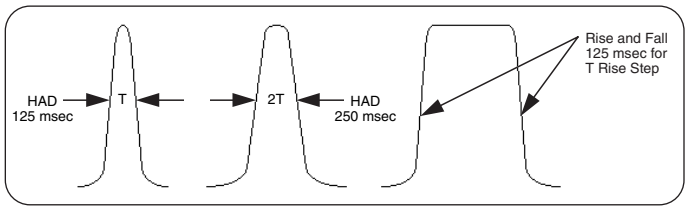
Simultaneous Colors – The number of colors in a display system that can be displayed on the screen at one time. This number is limited by the circuitry of the display adapter, and is often much smaller than the number of colors the display device can actually support. The number of simultaneous colors a display adapter supports is normally determined by the number of color planes, or bits per pixel, that it uses. For example, a device with 4 bits per pixel supports 16 simultaneous colors.

Sin (X)/X Pulse – This is a signal that has equal energy present at all harmonics of the horizontal scan frequency up to a cutoff point of 4.75 MHz. This allows it to produce a flat spectral display when viewed on a spectrum analyzer. Sin (x)/x is primarily designed for use with a spectrum

analyzer or an automatic measurement set. Very little information is discernible in a time domain display. The waveform is shown in the figure to the right. his signal is used for Frequency Response measurements. Refer to the Frequency Response discussion.



Sine-Squared Pulses – Sine-squared pulses are bandwidth limited and are useful for testing bandwidth-limited television systems. Fast rise time square waves cannot be used for testing bandwidth-limited systems because attenuation and phase shift of out-of-band components will cause ringing in the output pulse. These out-of-band distortions can obscure the in-band distortions that are of interest. **Description of the Pulse:** Sine-squared pulses look like one cycle of a sine wave as shown. Mathematically, a sine-squared wave is obtained by squaring a half-cycle of a sine wave. Physically, the pulse is generated by passing an impulse through a sine-squared shaping filter. **T Intervals:** Sine-squared pulses are specified in terms of half amplitude duration (HAD) which is the pulse width measured at the 50% pulse amplitude points. Pulses with HADs which are multiples of the time interval T are used to test bandwidth limited systems. T, 2T and 12.5T pulses are common examples. T is the Nyquist interval, or 1/2 fc where fc is the cutoff frequency of the system to be measured. For NTSC, fc is take to be 4 MHz, thus T is 125 nsec. **T Steps**: The rise times of transitions to a constant luminance level (such as the white bar) are also specified in terms of T. A T step has a 10% to 90% rise time of nominally 125 nsec, while a 2T step has a rise time of 250 nsec. Refer to the figure at the right. **Energy Distribution:** Sine-squared pulses possess negligible energy at frequencies above f=1/HAD. The amplitude of the envelope of the frequency spectrum at 1/(2 HAD) is one-half of the amplitude at zero frequency.



Single Channel – Channel-compatible, an ATV scheme fitting into 6 MHz of bandwidth.

Single Program Transport Stream (SPTS) – An MPEG-2 transport stream that contains one unique program.

Single-Domain Particle – All ferromagnetic materials are composed of permanently magnetized regions in which the magnetic moments of the atoms are ordered. These domains have a size determined by energy consideration. When a particle is small enough, it cannot support more than one domain and is called a single domain particle.

Single-Forked – A MooV file whose resources have been moved into the data fork, creating a file that can be played on a PC. See MooV.

Single-Line Display – In audio, a visual representation of changing frequencies

Single-Mode Fiber – An optical glass fiber that consists of a core of very small diameter. A typical single-mode fiber used in CCTV has a 9 mm core and a 125 mm outer diameter. Single-mode fiber has less attenuation and therefore transmits signals at longer distances (up to 70 km). Such fibers are normally used only with laser sources because of their very small acceptance cone.

Single-Page Mapping – Refers to always using Offset Register 0 (GR9) as the window into display memory. The mode is selected when GRB(0) is programmed to "0".

Single-Perf Film – Film stock that is perforated along one edge only.

Single-Step – Process of executing a program one instruction or machine cycle at a time.

Single-Strand Editing – See A-Roll.

Sink Current – Current input capability of a device.

SIS (Systems for Interactive Services) – ETS 300 802.

SIT (Selection Information Table)

Sizing – The operation of shrinking or stretching video data between a system's input and display. Normally, a combination of scaling and zooming.

Skew – a) Passage of tape over a head in a direction other than perpendicular to the height of the gap. **b)** Term used for an ADO action whereby rectangles become trapezoids.

Skin Effect – The tendency of alternating current to travel only on the surface of a conductor as its frequency increases.

Skip Frame – An optical printing effect eliminating selected frames of the original scene to speed up the action.

Skipped Macroblock – A macroblock for which no data is encoded.

Slapback – Discrete repeats created by either digital or tape delay.

Slate – a) To label with a take number by recording a voice on the tape. **b)** Term used for a frame of video text usually recorded after bars prior to countdown sequence at the top of a commercial or program containing information on date recorded, ad agency, direction, etc.

Slewing – The synchronizing of decks in computerized editing systems.

Slice – A series of macroblocks, all placed within the same row horizontally. Slices are not allowed to overlap. The division of slices may vary from picture to picture. If "restricted slice structure" is applied, the slices must cover the whole pictures. If "restricted slice structure" is not applied, the decoder will have to decide what to do with that part of the picture, which

is not covered by a slice. Motion vectors are not allowed to point at the part of the picture, which is not covered by a slice. Note that main profile utilizes "restricted slice structure", that is, all the slices put together must cover 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 – An 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.

Slide Timing – The outgoing (A-side) and incoming (B-side) frames change because the clip remains fixed while the footage before and after it is trimmed.

Slip – An editing feature that adjusts the In and Out points of a clip without affecting the adjacent clips or program duration.

Slip Trimming – The head and tail frames of the clip change because only the contents of the clip are adjusted. The frames that precede and follow the clip are not affected.

Slow Scan – The transmission of a series of frozen images by means of analog or digital signals over limited bandwidth media, usually telephone.

Slow-In/Slow-Out – In real life, when an object at rest begins to move, it starts slowly. Similarly, when an object changes its speed, or direction, it rarely does so instantaneously, but rather makes the change gradually (that is one reason we use splines to describe motion paths in computer animation). In order to create satisfying animation, it is important to be sensitive to the rate at which objects change their direction and speed; these factors are the most expressive component of path animation, like tempo and dynamics in music. In particular, the term slow-in/slow-out refers to an object at rest which gradually accelerates, reaches a final velocity, then slows and stops.

SLSC (Split-Luminance, Split-Chrominance) – A family of ATV schemes proposed by Bell Labs and IIT. SLSC is a receiver-compatible, non-channel compatible ATV scheme utilizing a high line rate camera and prefiltering with receiver line doubling to increase vertical resolution and additional bandwidth to increase horizontal resolution and help reduce NTSC artifacts. Aspect ratio is increased by blanking stuffing in the HBI. SLSC schemes have been proposed with at least two types of chroma encoding and three types of widescreen panel transmission.

S-MAC (Studio MAC) – a) A MAC standard proposed for studio intraconnection by the SMPTE working group on CAV standards. The S-MAC system uses time compression and time domain multiplexing techniques to convey (Y, CR, CB) video signals – a version of (Y, R-Y, B-Y). **b)** A MAC designed for single transmission of CAV signals in a television facility or between facilities. See also MAC.

Small Scale Integration (SSI) – Technology of less complexity than medium scale integration. Usually means less than ten gate functions in the IC.

Smart Slate – See Slate.

Smart Video Recorder Pro – Intel's PC video capture card that can capture and even compress video in real-time, using Indeo technology.

SMATV (Satellite Master Antenna Television) – Transmission of television programming to a Satellite Master Antenna installed on top of an apartment building, a hotel, or at another central location from where it serves a private group of viewers. The transmission usually is done in C-band to 1.5 or 2 meter dishes.

SMATV-DTM – SMATV system based on digital trans-modulation.

SMATV-IF – SMATV system based on distribution at IF (Intermediate Frequency).

SMATV-S – SMATV system based on distribution at extended super band.

Smear – A term used to describe a picture condition in which objects appear to be extended horizontally beyond their normal boundaries in a blurred or "smeared" manner.

SMI (Storage Media Interoperability)

SMIL (Synchronized Multimedia Integration Language) – Enables simple authoring of interactive audiovisual presentations. SMIL is typically used for "rich media"/multimedia presentations which integrate streaming audio and video with images, text or any other media type. SMIL is an easy-to-learn HTML-like language, and many SMIL presentations are written using a simple text-editor.

Smooth Shading – Even though an object may be represented by polygons, with smooth shading, the facets can be made to appear to blend into each other, making the object look smooth. Smooth shading also makes possible the simulation of "highlights".

SMPTE (Society of Motion Picture and Television Engineers) – American standardizing body. SMPTE 240M is the first SMPTE HDEP standard, calling for 1125 scanning lines, 2:1 interlace, a 16:9 aspect ratio, and 60 fields per second, among other characteristics. It is identical to the HDEP standard approved by ATSC. It need not be SMPTE's only HDEP standard, however. The Society has current standards for more than ten different videotape recording formats, with more pending. There are indications that members of SMPTE's WG-HDEP are interested in a progressively-scanned HDEP system, an evolution of the 1125-line interlace standard.

SMPTE 120M – NTSC color specification.

SMPTE 125M – SMPTE standard for Bit-Parallel Digital Interface – Component Video Signal 4:2:2. SMPTE 125M (formerly RP-125) defines the parameters required to generate and distribute component video signals on a parallel interface.

SMPTE 12M – Defines the longitudinal (LTC) and vertical interval (VITC) timecode for NTSC and PAL video systems. LTC requires an entire field time to store timecode information, using a separate track. VITC uses one scan line each field during the vertical blanking interval.

SMPTE 170M – Proposed SMPTE standard for Television – Composite Analog Video Signal, NTSC for Studio Application. This standard describes the composite color video signal for studio applications, system M/NTSC, 525 lines, 59.94 fields, 2:1 interface, with an aspect ratio of 4:3. This standard specifies the interface for analog interconnection and serves

as the basis for the digital coding necessary for digital interconnection of system M/NTSC equipment. Note: Parts of the system M/NTSC signal defined in this document differ from the final report of the Second National Television System Committee (NTSC 1953) due to changes in the technology and studio operating practices.

SMPTE 240M – SMPTE standard for Television – Signal Parameters – 1125/60 High-Definition Production System. This standard defines the basic characteristics of the video signals associated with origination equipment operating in the 1125/60 high-definition television production system. As this standard deals with basic system characteristics, all parameters are untoleranced.

SMPTE 244M – Proposed SMPTE standard for Television System M/NTSC Composite Video Signals Bit-Parallel Digital Interface. This standard describes a bit-parallel composite video digital interface for systems operating according to the 525-line, 59.94 Hz NESC standard 35 described by SMPTE 170M, sampled at four times color subcarrier frequency. Sampling parameters for the digital representation of encoded video signals, the relationship between sampling phase and color subcarrier, and the digital levels of the video signal are defined.

SMPTE 253M – Analog RGB video interface specification for pro-video SDTV systems.

SMPTE 259M – Proposed SMPTE standard for Television 10-Bit 4:2:2 Component and 4fsc NTSC Composite Digital Signals – Serial Digital Interface. This standard describes a serial digital interface a serial digital interface for system M (525/60) digital television equipment operating with either 4:2:2 component signals or 4fsc NTSC composite digital signals.

SMPTE 260M – Standard for high definition digital 1125/60.

SMPTE 266M – Defines the digital vertical interval timecode (DVITC).

SMPTE 267 – Defines the serial digital signal format for 16:9 aspect ratio television. The signal rate is 360 Mbps.

SMPTE 267M – Standard for component digital video with a 16:9 aspect ratio that uses both 13.5 MHz and 18 MHz sampling.

SMPTE 272M – The SMPTE recommended practice for formatting AES/EBU audio and auxiliary data into digital video ancillary data space.

SMPTE 274M – 1920 x 1080 Scanning And Interface.

SMPTE 276M – Transmission of AES/EBU digital audio and auxiliary data over coaxial cable.

SMPTE 291M – Ancillary data packet and space formatting.

SMPTE 292M – The SMPTE recommended practice for bit-serial digital interface for high definition television systems.

SMPTE 293M – 720 x 483 Active Line At 59.94 Hz Scan, Digital Representation.

SMPTE 294M – 720 x 483 Active Line At 59.94 Hz scan, Bit Serial Interfaces.

SMPTE 295M – 1920 x 1080 50 Hz Scanning And Interfaces.

SMPTE 296M – 1280 x 720 Scanning, Analog And Digital Representation And Analog Interface.

SMPTE 297M – Serial Digital Fiber Transmission For SMPTE 295M Signals.

SMPTE 298M – Universal Labels For Unique Identification Of Digital Data.

SMPTE 299M – The SMPTE recommended practice for 24-bit digital audio format for HDTV bit-serial interface. Allows eight embedded AES/EBU audio channel pairs.

SMPTE 305M – The SMPTE standard for Serial Digital Transport Interface.

SMPTE 308M – Television – MPEG-2 4:2:2 Profile At High Level.

SMPTE 310M – Television – Synchronous Serial Interface For MPEG-2 Transport Streams.

SMPTE 312M – Television – Splice Points For MPEG-2 Transport Streams.

SMPTE 314M – Television – Data Structure For DV Based Audio, Data And Compressed Video – 25 Mbps and 50 Mbps.

SMPTE 318M – Reference Signals For The Synchronization Of 59.95 Hz Related Video And Audio Systems In Analog And Digital Areas (Replaces RP 154). This standard reference is used to synchronize multi-format systems, with a field frequency of 59.94 Hz. In order to synchronize with equipment operating at 23.97 Hz (24/1.001) or 48 kHz, the black burst signal may carry an optional 10-field sequence for identification of the signal as specified in SMPTE 318M. The timing reference synchronizing line is inserted on lines 15 and 278 of a NTSE 525 59.94 Hz signal. The first pulse (1) is always present at the start of the 10-field identification sequence. Pulses (2-5) which are between 0 and 4-frame count pulses follow this. The end pulse (6) is always absent on line 15 and always present on line 278.

SMPTE 318M Data Line – SMPTE 318M data line is used for the following purposes: 1) Synchronization of digital audio operating at 48 kHz within a 525 59.94 Hz system; 2) Synchronization of 23.97 film rate material to 525 59.94 Hz system. Inserted on line 15 and 278 of NTSC 525 59.94 Hz signal.

SMPTE 322M – Data stream format for the exchange of DV-based audio, data and compressed video over a Serial Data Transport Interface (SDTI or SMPTE 305M).

SMPTE 344M – Defines a 540 Mbps serial digital interface for pro-video applications.

SMPTE 348M – High data-rate serial data transport interface (HD-SDTI). This is a 1.485 Gbps serial interface based on SMPTE 292M that can be used to transfer almost any type of digital data, including MPEG-2 program streams, MPEG-2 transport streams, DV bit streams, etc. You cannot exchange material between devices that use different data types. Material that is created in one data type can only be transported to other devices that support the same data type. There are separate map documents that format each data type into the 348M transport.

SMPTE Format – In component television, these terms refer to the SMPTE standards for parallel component analog video interconnection. The SMPTE has standardized both an RGB system and a (Y, PR, PB) color difference system – a version of (Y, R-Y, B-Y).

SMPTE RP 154 – Standard that defines reference synchronizing signals for analog or digital 525 line systems including recommendations for black burst.

SMPTE RP 155 – Standard for digital audio reference levels for digital VTRs. This is being revised into a studio standard.

SMPTE RP 160 – Analog RGB and YPbPr video interface specification for pro-video HDTV systems.

SMPTE RP 165 – Standard for error detection and handling in serial digital component and composite systems.

SMPTE RP 168 – Standard for vertical interval switching points for 525/625 systems.

SMPTE RP 219 – High definition/standard definition compatible color bar signal (SMPTE color bars) and is a series of television test signals, originally developed as multi-format color bars of ARIB STD-B28 (ARIB color bars), and was proposed to SMPTE by ARIB. Users are able to select 1 of 3 types of stripe width, transient characteristics (rise/fall time) and a combination of I and Q axis segments.

SMPTE Standard – See the SMPTE format discussion.

SMPTE Time Code – An 80-bit standardized edit time adopted by SMPTE. A binary time code denoting hours, minutes, seconds and video frames. See also Time Code.

SMPTE-VITC – SMPTE's vertical interval time code (VITC) format standard. The term VITC, used alone, usually refers to SMPTE-VITC.

SMS (Subscriber Management System) – A combination of hardware and software as well as human activities that help organize and operate the company business. The SMS is a part of a technical chain, referred to as the Entitlement Control Chain. The SMS contains all customer relevant information and is responsible for keeping track of placed orders, credit limits, invoicing and payments, as well as the generation of reports and statistics.

SN (Sequence Number)

SNA – Systems Network Architecture entered the market in 1974 as a hierarchical, single-host network structure. Since then, SNA has developed steadily in two directions. The first direction involved tying together mainframes and unintelligent terminals in a master-to-slave relationship. The second direction transformed the SNA architecture to support a cooperative-processing environment, whereby remote terminals link up with mainframes as well as each other in a peer-to-peer relationship (termed Low Entry Networking (LEN) by IBM). LEN depends on the implementation of two protocols: Logical Unit 6.2, also known as APPC, and Physical Unit 2.1 which affords point-to-point connectivity between peer nodes without requiring host computer control. The SNA model is concerned with both logical and physical units. Logical units (LUs) serve as points of access by which users can utilize the network. LUs can be viewed as terminals that provide users access to application programs and other services on the network. Physical units (PUs) like LUs are not defined within SNA architecture, but instead, are representations of the devices and communication links of the network.

SNAP (Subnetwork Access Protocol) – Internet protocol that operates between a network entity in the subnetwork and a network entity in the end system. SNAP specifies a standard method of encapsulating IP datagrams and ARP messages on IEEE networks. The SNAP entity in the end system makes use of the services of the subnetwork and performs three key functions: data transfer, connection management, and QoS selection.

SNG (Satellite News Gathering) – The temporary and occasional transmission with short notice of television or sound for broadcasting purposes, using highly portable or transportable uplink earth stations operating in the framework of the fixed-satellite service.

SNHC (Synthetic and Natural Hybrid Coding)

SNMP (Simple Network Management Protocol) – A widely used network monitoring and control protocol. Data is passed from SNMP agents, which are hardware and/or software processes reporting activity in each network device (hub, router, bridge, etc.) to the workstation console used to oversee the network. The agents return information contained in a MIB (Management Information Base), which is a data structure that defines what is obtainable from the device and what can be controlled (turned off, on, etc.). Originating in the UNIX community, SNMP has become widely used on all major platforms.

Snow – a) Heavy random noise. **b)** White flashes appearing in the video image caused by random noise and/or loss of magnetic particles.

SNR – See Signal-to-Noise Ratio.

SNR Scalability – A type of scalability where the Enhancement Layer(s) contain only coded refinement data for the DCT coefficients of the base layer. SNR scalability is aimed at transmission in noisy environments, and offers a form of graceful degradation. Under poor reception conditions, only the lower layer (which is covered by the highest error protection) is decoded. The picture quality is then not the best, of course, but at least a picture is available. The alternative is a total loss of picture (the "brick wall" effect) below a certain SNR. The lower layer and the Enhancement Layer operate with the same resolution, but the Enhancement Layer may contain the higher frequencies of the picture.

SOF (Sound On Film) – The sound track is on the film itself.

Soft – a) The opposite of "hard". **b)** As applied to a photographic emulsion or developer, having a low contrast. **c)** As applied to the lighting of a set, diffuse, giving a flat scene in which the brightness difference between highlights and shadows is small.

Soft Border – a) The quality of diffusion between adjacent visual areas in a picture around a pattern. **b)** A wipe pattern border which is missing between the "A" bus video and "B" bus video on the edges to give a soft effect. This has no matte color added.

Soft Edge – An edge between two video signals in which the signals are mixed together for a soft transition effect, used on both patterns and keys.

Soft Edit – An electronic edit that maintains source clips in memory and tracking processes so that edits can be modified without starting from scratch.

Soft Key – a) A selector on the display that changes state or initiates an action when you touch it on screen. You use soft keys to select test signals or a sub-window of functions or to enter a file name. **b)** A soft key's function changes to match the block above it, in the bottom line of the screen. **c)** The softening of a key edge by reducing the gain of the keyer.

Soft Wipe – A split screen or wipe effect with a soft border or edge where the two images join.

Softness – A blending or mixing along lines or edges in an image.

Software – Operating instructions loaded into computer memory from disk that controls how system hardware will execute its operation. See Programs.

Software Effect – An effect that must be rendered by an editing application before it can be played back. Contrast with Real-Time

Software Option – Any software product that you buy other than the standard system software that comes on your system disk.

Solarization – Special effect in which the lightest and darkest values of a picture are made dark while the middle tones become light. An ADO effect. Also a photo-optic process.

Solder Bridge – Glob of excess solder that shorts two conductors. A common problem on production PC boards.

Solid – Polygons meshed together to create closed volumes. It is a compact set of contiguous points in three-dimensional space.

Solo – To listen to one mike or track of a tape without listening to the others through the use of a solo button.

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

Sone – A unit of loudness. 2 sones are twice as loud as 1 sone.

SONET (Synchronous Optical Network) – A fibre optic standard with data rates ranging from 51.84 Mbps up to Gbps.

Sonic Welded Assembly – Refers to the joining of the two plastic parts of a cassette by the use of a sonic weld, actually melting the plastic at the point of joining.

Sony – First company to sell an HDEP recorder, making HDEP practical. Also the strongest HDEP proponent, spending a great deal to promote it and going so far as to display the products of some of its competitors, as long as they complied with the 1125 scanning-line system.

Sorting – The arranging of clips in a bin column in numerical or alphabetical order, depending on the column the user selects.

Sound Booth – Term for a small acoustically dead room from which an announcer will record voice overs.

Sound Designer II – A trademark of Avid Technology, Inc. An audio file format used for the import and export of digital audio tracks.

Sound Digitizer – A device that records sounds and stores them as computer files.

Sound Pressure Levels (SPL) – a) A measure of the sound pressure created by a sound, usually in the units of dB referred to 0.0002 microbar of pressure. **b)** A measure of acoustic wave force. The force that sound can exert against an object; our ear drums are an example. It is measured in dB and is "0" referenced to 1 dyne per square centimeter.

Sound-on-Sound – A method by which material previously recorded on one track of a tape may be rerecorded on another track while simultaneously adding new material to it.

Source – Video producing equipment such as cameras, tape recorders or character generators.

Source (Menu) – The function that changes the aspect ratio and size of the image. The word Source refers to the image generated by the input video, which occupies "Source Space" on the screen. **a)** Source Aspect uses the X and Y axis **b)** Source Size uses the Z axis. The image does not move.

Source Clip – One of the lowest level building blocks of a sequence composition. See also Clip, Master Clip, Subclip.

Source Code – Program written in other than machine language. May be assembly language or a high-level language.

Source Coding – Coding that uses a model of the source from which parameters are extracted and transmitted to the decoder. When used particularly for voice, the coders are called vocoders.

Source Current – Current output capability of a device.

Source Input Format (SIF) – The luminance component is defined as 352 pixels x 240 lines at 30 Hz for NTSC or 352 pixels x 288 lines at 25 Hz for PAL and SECAM. Defined such that the data rates are the same for field rates for 60 HZ and 50 Hz.

Source Mode – A method of assembly that determines in what order the edit controller reads the edit decision list (EDL) and assembles the final tape. There are five different types of source mode: A-Mode, B-Mode, C-Mode, D-Mode and E-Mode.

Source Monitor – The interface window of Adobe Premiere that displays clips to be edited.

Source Side – In color correction, the first of two available levels of color adjustment. Corrections made on the source side typically seek to restore the original color characteristics of a clip or achieve basic clip-to-clip color consistency among the clips in a sequence. See also Program Side.

Source Stream – A single, nonmultiplexed stream of samples before compression coding.

Source Synchronizing Generator – A synchronizing pulse generator used to drive a specific piece of source equipment. It is referenced to a master reference synchronizing generator.

Source Timing Modules – A synchronizing generator on a module that is used to adjust the timing of a specific piece of source equipment. It is kept in time by a reference sync pulse generator.

Source/Tape Switch – A control found on control amplifiers with tape monitor jacks, and on recorders with monitor heads; allows comparison of the signal being fed to the tape (source) with the signal just recorded.

Southwestern Bell – A Baby Bell, and the first organization to transmit HDHEP 9 as opposed to some bandwidth-reduced form of ATV) a long distance, via optical fiber.

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

Sparkle – An ADO DigiTrail effect.

Spatial – Relating to the area of an image. Video can be defined by its spatial characteristics (information from the horizontal plane and vertical

plane) and its temporal characteristics (information at different instances of time).

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. See also Codec.

Spatial Domain – Waveforms are two dimensional functions of location in space, f (x,y).

Spatial Encoding – The process of compressing a video signal by eliminating redundancy between adjacent pixels in a frame.

Spatial Prediction – Prediction derived from a decoded frame of the lower layer decoder used in spatial scalability.

Spatial Resolution – a) What is usually referred to as resolution, linearly measurable detail in an image, in the vertical, horizontal, or diagonal directions. **b)** The clarity of a single image or the measure of detail in an image. See resolution.

Spatial Sampling – Where an image changes a given number of times per unit distance and is sampled at some other number of times per unit distance as opposed to temporal sampling where the input changes with respect to time at some frequency and is sampled at some other frequency.

Spatial Scalability – A type of scalability where an Enhancement Layer also uses predictions from pel data derived from a lower layer without using motion vectors. The layers can have different frame sizes, frame rates or chroma formats. Spatial scalability offers a layering of the picture resolution, suitable for HDTV transmissions, for instance. By decoding of the lower layer, a "normal" picture is obtained, and by decoding of the Enhancement Layer, the HDTV picture may be constructed.

Spatio-Temporal Filtering – Filtering in both space and time.

Spatio-Temporal Spectrum – A three-dimensional representation of the energy distribution of a television signal. The three dimensions are horizontal, vertical, and time.

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. IEC 60958 now fully defines this interface for consumer and professional applications.

Special Effects – Artistic effects added to a video production in order to enhance the production by creating drama, enhancing the mood or furthering the story. Special effects may vary from the limited addition of patterns or the mixing of several video images together, to sophisticated digital effects such as picture compression, page flipping and three-dimensional effects. Special effects are usually created using SEGs such as those included in the Video Equalizer, Video TitleMaker 2000 and Digital Video Mixer.

Special Effects Generator – A video component that processes video signal and has the ability to manipulate the signal with a variety of wipes and distortions.

Special Magnetic Moment – The value of the saturation moment per unit weight of a magnetic material expressed in emu/gm. The specific magnetic moment is the most convenient quantity in which to express the saturation magnetization of fine particle materials.

Spectra Key – An enhancement to a standard RGB chroma key, employing a patented chroma nulling circuitry, thereby removing any color from the background video. This enables keys to be performed through glass or smoke or with shadows. This would otherwise not be possible without the blue or green fringing effect typical of standard RGB keyers.

Spectral Analysis – a) Determination of the monochromatic components of the luminance considered. **b)** Objective detailed specification of a white reference, of a color, or of the transmission function, with respect to wavelength and intensity.

Spectral Sensitivity – Quotient of the detector output dY(lambda) by the monochromatic detector output dXc(lambda)=Xclambda(lambda)dlambda in the wavelength interval dlambda as a function of the wavelength lambda.

Spectrophotometric Match – Spectrophotometry determines the spectral transmittance and the spectral reflectance of objects … to compare at each wavelength the radiant flux leaving the object with that incident upon it. A spectrophotometric match thus occurs only when the two objects being compared are identical in their color structure. Such a match will be maintained regardless of viewing conditions. Spectrophotometric matches are seldom encountered and rarely necessary; in practice, the usual objective is to achieve a metameric match. Metameric matches, however, appear identical only under one set of specified viewing conditions.

Spectrum – a) In electromagnetics, spectrum refers to the description of a signal's amplitude versus its frequency components. **b)** In optics, spectrum refers to the light frequencies composing the white light which can be seen as rainbow colors.

Spectrum Allocation – Designation of certain bandwidths at certain frequencies for certain purposes. For example, channel 2 has been allocated 6 MHz of bandwidth from 54 MHz to 60 MHz for television broadcasting. All ATV transmission schemes require some form or another of spectrum allocation. See also Frequency Allocation Table.

Spectrum Analyzer – An electronic device that can show the spectrum of an electric signal.

Specular – An intense highlight caused when light reflects off an object in an image. A specular is not used as the basis for determining the true white point for an image.

Speed – The point at which videotape playback reaches a stable speed, all servos are locked, and there is enough pre-roll time for editing, recording, or digitizing.

SPG (Sync Pulse Generator) – A source of synchronization pulses.

SPI (Synchronous Parallel Interface)

Spike – See Overshoot.

SPL (Sound Pressure Level) – The SPL of a sound is equal to twenty times the logarithm (base 10) of the ratio of the root-mean-square sound pressure to the reference sound pressure. As a point of reference,

0 dB-SPL equals the threshold of hearing, while 140 dB-SPL produces irreparable hearing damage.

Splice – A physical join between pieces of tape or film. An edit in which the material already on the video or audio track is lengthened by the addition of new material spliced in at any point in the sequence. See also Overwrite.

Splicing – Concatenation of, or switching between, two different streams of compressed data.

Splicing Tape – A special pressure-sensitive, non-magnetic tape used for joining two lengths of magnetic tape.

Spline – a) A type of mathematical model used to represent curves. They are usually displayed as polylines with a large number of very small sides. The importance of splines is that they give very smooth curves for a relatively small number of points. **b)** In wooden ships, the curved skeleton of a hull is built by attaching bendable strips of wood to small, fixed, and angled blocks of wood. The strips are splines. In computer graphic splines, the blocks of wood are called control points. In computer graphics, curved lines are always visualized by drawing many short vectors. However, since each vector requires a fair amount of storage, curves are often stored in terms of their control points; whenever the curve is needed, the spline is recreated. Another advantage of storing splines as curves is the ease with which a spline curve is manipulated by moving its control points. Instead of moving the curve's vectors one at a time, a large section of the curve is moved by dragging its control point. Splines convert discontinuity into smoothness. These properties make splines very useful in animation. When we create a keyframe for path animation, the object's position becomes a control point for a spline that defines the entire path for all the in-between frames as well. This allows us to get smooth motion between all the keyframes, and avoid instantaneous (single frame) changes of direction. Such changes would be highly unrealistic and could never yield satisfying animation. Another tremendous advantage of splines is that they are resolution independent. Magnifying and then redrawing a shape that is represented by a spline does not reveal the short vectors that represent the curve on the screen, because these vectors are recalculated to take into account the new magnification. Spline represented objects can also be easily rotated or skewed in 3D, again with no loss in clarity. So called "vector-based" systems make use of these features by representing fonts and shapes with splines, rather than the traditional bitmap. Bitmap systems, on the other hand, cannot represent or manipulate shapes nearly as handily.

Split Edit – Type of edit transition where either the video or audio of the source is delayed from being recorded for a given time.

Split Screen – An electronic process which allows the viewing of two video images, side by side or above and below, on-screen simultaneously.

Split Screen Unit – Equipment that simultaneously displays parts or more than one image on a single monitor. It usually refers to four quadrant displays. Also called Quad Compressor.

Split Sync Scrambling – Video scrambling technique, used with horizontal blanking inversion, active video inversion, or both. In split sync, the horizontal sync pulse is "split", with the second half of the pulse at +100 IRE instead of the standard -40 IRE. Depending on the scrambling mode, either the entire horizontal blanking interval is inverted about the +30 IRE axis, the active video (after color burst and until the beginning of front porch blanking) is inverted about the +30 IRE axis, both are inverted, or neither is inverted. By splitting the horizontal sync pulse, a reference of both -40 IRE and +100 IRE is available to the descrambler. Since a portion of the horizontal sync is still at -40 IRE, some sync separators may still lock on the shortened horizontal sync pulses. However, the timing circuits that look for color burst a fixed interval after the beginning of horizontal sync may be confused. In addition, if the active video is inverted, some video information may fall below 0 IRE, possibly confusing sync detector circuits. The burst is always present at the correct frequency and timing, however, the phase is shifted 180 degrees when the horizontal blanking interval is inverted.

Spoking – A form of buckling in which the tape pack is deformed into a shape which approximates a polygon.

Spot – Term used for a commercial.

Spot Color Correction – A color adjustment made to a specific part of a video image that is identified using drawing tools. See also secondary color correction.

Spot Light – A unidirectional source geometrically defined by its position and target.

Spotlight – a) The effect of a spotlight falling on a video scene, and the switcher feature that allows this to be accomplished. On the AVC the spotlight control adjusts attenuation of the A bus video. A typical spotlight effect is obtained by selecting the same source on both buses, a soft bordered circle wipe, and utilizing size and position control. Many other effects are also possible with this feature. **b)** A highlight effect produced by a full-strength video signal shaped by a wipe pattern and an attenuated (darkened) signal from the same video source. This is activated by selecting spotlight on the M/E effects group of buttons, and adjusting spotlight control on the pattern adjust group of controls to darken the desired area.

Sprites – 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).

Sprocket – A toothed driving wheel used to move film through various machine by engaging with the perforation holes.

Square Pixels – Pixels generated in a television system having the same horizontal and vertical resolution. There is some evidence that a large mismatch between horizontal and vertical resolution prevents the higher resolution from being fully perceived by the human visual system. NTSC was created with square pixels with a resolution of approximately 330 by 330 lines.

Squareness – A measure of magnetic behavior expressed as a ratio. 1.00 would be considered perfect and the normal range for magnetic material is 0.7 to 0.9.

Squeal – Audible tape vibrations, primarily in the longitudinal mode, caused by frictional excitation at heads and guides.

Squeeze – A change in aspect ratio. Anamorphic lenses sometimes squeeze a widescreen scene by a factor of two horizontally, so it will fit on a 1.33:1 aspect ratio frame. In projection, another anamorphic lens "expands" the squeeze (squeezes vertically) to restore the original aspect ratio. When a widescreen film is presented on television without being expanded, it is said to be squeezed. An unexpanded film print is said to be a squeeze print (the opposite is "flat").

Squeezed Video – See Anamorphic.

SRI (Stanford Research Institute) – SRI International owns DSRC, developer of the ACTV schemes.

SRM (Session and Resource Manager)

SSA – See Serial Storage Architecture.

SSCG (Spread-Spectrum Clock Generator)

SSI – See Small Scale Integration.

ST (Stuffing Table) – An optional DVB SI table that authorizes the replacement of complete tables due to invalidation at a delivery system boundary such as a cable headend.

Stabilization – A specialized form of motion tracking used to eliminate unwanted motion such as camera movement from a clip. Stabilization works by tracking an inherently unmoving object in the clip and repositioning each frame or field of video to keep that object stationary.

Stabilize – a) Remove motion jitter and unwanted camera movement from a clip. **b)** To track an image in a clip.

Stack – Block of successive memory locations that is accessible from one end on a last-in-first-out basis (LIFO). For most processors, the stack may be an block of successive locations in the read/write memory.

Stack Pointer – Contains the address of the top of the stack. In general, the stack pointer is decremented immediately following the storage in the stack of each byte of information. Conversely, the stack pointer is incremented immediately before retrieving each byte of information from the stack.

Staircase – A pattern generated by the TV generator, consisting of equal width luminance steps of 0, +20, +40, +60, +80, and +100 IRE units and a constant amplitude chroma signal at color burst phase. Chroma amplitude is selectable at 20 IRE units (low stairs) or 40 IRE units (high stairs). The staircase pattern is useful for checking linearity of luminance and chroma gain, differential gain and differential phase.

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

Stand-Alone Workstation – A workstation that is not connected to a network.

Standard – a) The specific signal configuration, reference pulses, voltage levels, etc., that describe the input/output requirements for a particular tape of equipment. Some standards have been established by professional groups or government bodies (such as SMPTE or EBU). Others are determined by equipment vendors and/or users. **b)** A set of rules or characteristics defining a particular television system. Some standards (such as those contained in FCC rules and regulations) are mandatory. Most (including those of the EIA, IEEE, and SMPTE) are voluntary. The establishment of a standard often freezes development at a certain level but allows users and manufacturers to deal with a much larger array of products than might be available without a standard. There is currently one U.S. HDEP standard, the ATSC/SMPTE 1125 scanning-line system. CCIR system E is an HDTV transmission standard, used in France, calling for 819 scanning lines in a 14 MHz bandwidth.

Standard Bodies – Any country having a national group of people consisting of experts from industry and universities who develop standards for all kinds of engineering problems.

Standard Definition Television – See SDTV.

Standard Input Format – Video format 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 525/59.94 SIF format has a resolution of 352 x 240 active pixels and a refresh rate of 29.97 frames per second. 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.

Standards Converter – A device for converting signals from one standard to another. Converting between different color schemes with the same scanning structure is called transcoding. Converting between different scanning structures requires line and field interpolation, which usually introduces artifacts. Standards conversion between 525 scanning line and 625 scanning line signals is performed regularly. Conversion from DHEP to either NTSC or a receiver-compatible ATV system will require standards conversion. It may seem that it is more difficult to convert from 1125 scanning lines to 525 than from 1050 to 525, but in a pre-filtering converter the difference, if any, may not be large. For dealing with the field-rate difference (HDEP 60 and NTSC 59.94), some DHEP to NTSC conversions are performed by slowing the HDEP recorders to 59.94-field playback. Others are performed through standards converters that periodically omit fields.

Standing Wave Ratio – The ratio of transmitted power to reflected power in transmission lines, antenna systems, connectors, etc.

STAR System (Setup Swap, Transfer and Recall Panel Memory System) – This describes the possible operations of this feature, utilizing the concept of a setup as an instantaneous snapshot of a complete switcher panel, including all button selections, adjustments, positions, and fader values. Setups may be broken down into each of the six major modules on the switcher, with the ability to store or recall them independently into any of eight setup registers. This system also provides the capability of transferring the setup of one M/E to another, or swapping their setups.

Starsight – An electronic program guide that you subscribe to. It allows you to sort the guide by your order of preference and delete stations you never watch. It's a national service, that is regionalized. The decoders in Houston only download data for Houston. Move to Dallas and you only get Dallas. It is present on NTSC lines 14 and 277, and uses encoding similar to EIA-608.

Start Bit – A bit preceding the group of bits representing a character used to signal the arrival of the character in asynchronous transmission.

Start Codes (System and Video) – 32-bit codes embedded in that coded bit stream that are unique. They are used for several purposes including identifying some of the structures in the coding syntax. Start codes consist of a 24-bit prefix (0 x 000001) and an 8-bit stream_id.

Start of Active Video (SAV) – Digital data that indicate the start of active video time in serial digital component video systems.

Startup Disk – The disk that contains the operating system files. The computer needs operating system information in order to run.

Static Electricity – Whenever your body comes in physical contact with metal parts (including printed circuit boards) of computer equipment there is the potential for you to feel an electrical shock (electro-static discharge or ESD) which could damage the equipment. To prevent this you must always wear a wrist strap when working with internal parts of a workstation.

Static Memory – Memory devices that do not need clocks or refreshing.

Static Resolution – Detail in a stationary image. Any amount of bandwidth is sufficient for the transmission of HDTV images with high static resolution, even a telephone line; the smaller the bandwidth, the longer it takes to transmit all of the resolution. Therefore, many ATV schemes with reduced bandwidths offer the static resolution of HDEP with limited dynamic resolution, resulting in motion artifacts such as motion surprise.

Statistical Multiplexing – Increases the overall efficiency of a multi-channel digital television transmission multiplex 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.

Status – Present condition of the device. Usually indicated by flag flip-flips or special registers. See Flag.

Status Monitor – A B/W video output available as an option on AVC series switchers that provides display of all switcher adjustments, pattern menus, and diagnostic tools.

STB – See Set Top Box.

STC (System Time Clock) – The common clock used to encode video and audio in the same program. A 27 MHz clock regenerated from PCR for a jitter-free readout of MPEG data.

STD (System Target Decoder) – A hypothetical reference model of a decoding process used to describe the semantics of an MPEG multiplexed system bit stream.

STD Input Buffer – A first-in, first-out buffer at the input of a system target decoder for storage of compressed data from elementary streams before decoding.

Stderr – Standard error file. Error messages sent by programs are displayed on the screen, which is by default the Stdout.

Stdin – Standard input file.

Stdout – Standard output file.

STE (System Target Error) – The STE gives a global indication about the overall distortion present on raw received data.

Steady Gate – A pin-registered device manufactured by Steady Film for precise telecine transfer. Provides more stables images than EPR, but does not operate in real time.

Steady Shot – A system designed to improve hand-held camera video recording by compensating for camera-shake.

STED (System Target Error Deviation)

STEM (System Target Error Mean)

Step Printer – A printer in which each frame of the negative and raw stock is stationary at the time of exposure.

Stepping – a) Unsmooth packing, with transversally mispositioned sections. **b)** The movement forward or backward one frame at a time. See also Jogging.

Stereo – Sound received from two separate sources. Simulates human hearing.

Stereo Mixing – Simultaneous processing of both left and right audio channels.

Stereo Mode – Two audio channels which form a stereo pair (left and right) are encoded in a single bit stream.

Stereophonic, Stereo – Using two or more channels to create a spatial effect.

Stick Slip – The process in which the tape sticks to the recording head because of high friction; the tape tension builds because the tape is not moving at the head; the tape tension reaches a critical level, causing the tape to release from and briefly slip past the read head at high speed; the tape slows to normal speed and once again sticks to the recording head; this process is repeated indefinitely. Characterized by jittery movement of the tape in the transport and/or audible squealing of the tape.

Sticky Shed – a) The gummy deposits left on tape path guides and heads after a sticky tape has been played. The phenomenon whereby a tape binder has deteriorated to such a degree that it lacks sufficient cohesive strength so that the magnetic coating sheds on playback. **b)** The shedding of particles by the tape as a result of binder deterioration that causes dropouts on VHS tapes.

Sticky Tape – Tape characterized by a soft, gummy, or tacky tape surface. Tape that has experienced a significant level of hydrolysis so that the magnetic costing is softer than normal. Tape characterized by resinous or oily deposits on the surface of he magnetic tape.

Stiction – A term loosely used to describe the phenomenon of tape adhering to transport components such as heads or guides.

Still Frame – A single frame of video repeated so it appears to have no motion.

Still Picture – A coded still picture consists of a video sequence containing exactly one coded picture which is intra coded. This picture has an associated PTS, and the presentation time of succeeding pictures, if any, is later than that of the still picture by at least two picture periods.

Still Store – Device for storage of specific frames of video, either in analog or digital form, allowing extremely fast access time.

STL (Studio Transmitter Link) – System used to connect transmitter to studio if the facilities are located in different areas.

Storage – See Memory.

Storage Capacity – Using the ITU-R 601 4:2:2 digital coding standard, each picture occupies a large amount of storage space, especially when related to computer storage devices such as DRAM and disks. So much so that the numbers can become confusing unless a few benchmark statistics are remembered. Fortunately, the units of mega, giga, tera and penta make it easy to express the very large numbers involved. The capacities can all be worked out directly from the 601 standard. Bear in mind that sync words and blanking can be regenerated and added at the output, only the active picture area need be stored.

Store – The action of retaining in memory panel parameters (in the case of switchers), edit decision lists (in the case of editors), frames of video (in the case of machines like AVA, ESS and CGs).

Story – The Avid term for an edited piece. A story is created by editing clips and sequences together.

Storyboard – A storyboard is an animator's sketch, or rough of all the keyframes involved in a particular piece of animation. Used as a visual script or shooting plan.

Stow – To reduce a window to an icon for later use. In Windows® it is called "minimize".

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

Streaking – A term used to describe a picture condition in which objects appear to be extended horizontally beyond their normal boundaries. This will be more apparent at vertical edges of objects when there is a large transition from black to white or white to black. The change in luminance is carried beyond the transition, and may be either negative or positive. For example, if the tonal degradation is an opposite shade to the original figure, (white following black), the streaking is called negative; however, if the shade is the same as the original figure, (white following white), the streaking is called positive. Streaking is usually expressed as short, medium or long streaking. Long streaking may extend to the right edge of the picture, and in extreme cases of low-frequency distortion, can extend over a whole line interval.

Stream – A collection of digital data of one type; such as a video stream, an audio stream or a subtitle stream. Each stream, for example an audio stream, may also have channels within it.

Stream Multiplex Interface (SMI) – An interface modeling the exchange of SL-packetized stream data and associated control information between the Sync Layer and the TransMux Layer.

Stream Objects – A class in the MPEG-4 class hierarchy that represents the interface of the elementary streams.

Streaming – The process of sending video over the Web or other networks to allow playback on the desktop as the video is received, rather than requiring the entire file to be downloaded prior to playback.

Streaming Media – Sending video or audio over a network as needed, such as Real Audio/Video or Microsoft NetShow, instead of forcing the user to download the entire file before viewing it. Typically a few seconds of data is sent ahead and buffered in case of network transmission delays. (Although some data is buffered to the hard drive, it is written to temporary storage and is gone once viewing is complete.)

Streaming Video – Compressed audio and video that is transmitted over the Internet or other network in real time. Typical compression techniques are MPEG-2, MPEG-4, Microsoft WMT, RealNetworks, and Apple's QuickTime. It usually offers "VCR-style" remote control capabilities such as play, pause, fast forward, and reverse.

Stress Testing – Introducing mechanical, electrical, or thermal stress on electrical devices so as to modify their operation and allow intermittent problems and/or failures to be observed.

Strip – Part of a wide roll of manufactured film slit to its final width for motion picture use.

Stripe – A narrow band of magnetic coating or developing solution applied to a length of motion picture film.

Striped Stock – Film stock to which a narrow stripe of magnetic recording material has been applied for the recording of a sound track. See Black and Code.

Striping – Preparing a tape for editing by recording continuous control track, timecode, and a video signal (e.g., black). Also known as Black Stripe.

Striping a Tape – Preparing a tape for editing by recording continuous control track, time code, and a video signal (such as black or colour bars).

Structured Audio – A method of describing synthetic sound effects and music.

STS (Synchronization Time Stamp) – The Synchronization Time Stamp (STS) is the number of 100 ns time intervals between the last 1 second clock tick of the common time reference and the occurrence in the MPEG-2 transport stream of the first bit of the MPEG-2 packet sync byte in the header of the distributed transmission packet (DXP) at the output of the distributed transmission adapter (DXA).

STT (System Time Table) – An ATSC PSIP table that carries the current date and time of day. It provides timing information for any application requiring schedule synchronization.

STU (Set Top Unit) – See Set Top Box.

Studio Address System – An intercom system that allows communication between control room personnel and personnel working on the studio floor.

Studio Standard, HDTV – a) Approaches to the specification of a studio standard, HDTV have been in the context of present operations in 525/59.94 and 625/50 i.e., operations in the studio conform to the specifications for transmission and broadcast. The studio standard with its implication of no systems transform, therefore, might be described also as one of the distribution standards – expected to be one of the inputs to display, and to be evaluated by subjective judgment of the display.
b) As employed by CCIR Rep 801-4 and its annexes, the term studio standard loosely embraces everything from image capture through distribu-

tion. To illustrate the interpretation by examples from- the document. **(a) Sec 1, Introduction:** A single standard could be beneficial to program producers as well as broadcasting organizations and viewers. **(b) Sec 2, Technical Matters:** This entire section is concerned with defining the system by reference to the subjective, visual appraisal of the final display. **(c) Annex II,** entitled Parameter Values for Signal Generation in HDTV Studios and For International Exchange of HDTV Programs. (**d) Sec 1e** explains that the advantages of a single HDTV worldwide standard includes lower HDTV equipment costs for broadcasters and viewers, easier exchange of programs and technical information, and encouragement to the ideal of international solutions to common technical problems. These concepts of a studio standard accordingly address only a small part of what the SMPTE Committee on Hybrid Technology considers production.

Stuffing (bits); Stuffing (bytes) – Code-words that may be inserted into the compressed bit stream that are discarded in the decoding process. Their purpose is to increase the bit rate of the stream.

STV (Subscription Television) – Pay television, in which subscribers, or viewers, pay a monthly fee.

Sub-band Adaptive Differential Pulse Code Modulation (SB-ADPCM) – The audio frequency band is partitioned into two sub-bands and then each sub-band is encoded using ADPCM.

Sub-Band Coding – A pure sub-band coder performs a set of filtering operations on an image to divide it into spectral components. Usually, the result of the analysis phase is a set of sub-images, each of which represents some region in spatial or spatio-temporal frequency space. For example, in a still image, there might be a small sub-image that represents the low-frequency components of the input picture that is directly viewable as either a minified or blurred copy of the original. To this are added successively higher spectral bands that contain the edge information necessary to reproduce the original sharpness of the original at successively larger scales. As with DCT coder, to which it is related, much of the image energy is concentrated in the lowest frequency band. For equal visual quality, each band need not be represented with the same signal-to-noise ratio; this is the basis for sub-band coder compression. In many coders, some bands are eliminated entirely, and others are often compressed with a vector or lattice quantizer. Succeedingly higher frequency bands are more coarsely quantized, analogous to the truncation of the high frequency coefficients of the DCT. A sub-band decomposition can be the intraframe coder in a predictive loop, thus minimizing the basic distinctions between DCT-based hybrid coders and their alternatives.

Subcarrier (SC) – a) The modulation sidebands of the color subcarrier contain the R-Y and B-Y information. For NTSC, the subcarrier frequency is 3.579545 MHz. For PAL the subcarrier is approximately 4.43 MHz. **b)** An auxiliary information carrier added to the main baseband signal prior to modulation. The most common example in television is the NTSC color subcarrier. Many ATV schemes propose adding additional subcarriers to NTSC. **c)** A sine wave which is imposed on the luminance portion of a video signal and modulated to carry color information. Subcarrier is also used to form burst. The frequency of subcarrier is 3.58 MHz in NTSC and PAL-M and 4.43 MHz in PAL. d) The high-frequency signal used for quadrature amplitude modulation of the color difference signals.

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.

Sub-Channel – A transmission path within the main transmission path. Subcarriers are examples of sub-channels, but there are others. Quadrature modulation of the picture carrier provides a sub-channel; so does blanking stuffing.

Subclip – a) An edited part of a clip. In a sequence, a subclip can be bound by any variation of clip beginnings, endings, and mark points. **b)** A subclip created by marking IN and OUT points in a clip and by saving the frames between the points. The subclip does not contain pointers to media files. The subclip references the master clip, which alone contains pointers to the media files.

Submaster – High quality copy of a master tape used to make additional copies. See also Dub.

Sub-Nyquist Sampling – A scheme for sampling at a frequency lower than that prescribed by the Nyquist sampling theorem.

Subpicture – A DVD data type that is used to describe an overlay over video such as is used for menus, subtitles, simple animation.

Sub-Picture Information – Captions, subtitles or other text that can be displayed or hidden.

Subpicture Menu – Menu used to select a subpicture stream.

Sub-Pixel – A spatial resolution smaller than that of a pixel. 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 television needs to be created to a finer accuracy than the pixel grid itself, otherwise the curve will look jagged. Again, when tacking 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.

Subroutine – Self-contained portion of a program that performs a well-defined task. May be used at place in the same program.

Subsampled – Signal that has been sampled at a lower rate than some other signal in the system. A good example of this is the Y'CbCr color space used in component serial video (ITU-R BT.601). For every two luma (Y') samples, only one Cb and Cr sample is taken causing the Cb and Cr signals to be subsampled.

Subsampled Signal – A signal that has been sampled at a lower rate than some other signal in the system.

Sub-Sampling – Sampling within samples. For example, dividing an NTSC pixel into three or four sub-pixels is an example of sub-sampling. Some ATV schemes use such pixel subdivision to transmit a high definition image over a sequence of multiple fields or frames, with only one sub-pixel being transmitted per field or frame. The resulting potential artifacts include motion surprise and twinkle.

Subsidiary Communications Authorizations – Authorizations granted to FM broadcasters for using subcarriers on their channels for other communications services.

Substrate – A DVD half-disc. Two substrates, each 0.6 mm thick, are bonded together to form a 1.2 mm thick DVD disc.

Subtitles – Text that is added below or over a picture that usually reflects what is being said, possibly in another language. Open subtitles are transmitted as video that already has the subtitles present. Closed subtitles are transmitted during the VBI, and relies on the TV to decode it and position it below or over the picture. Closed captioning is a form of subtitling. Subtitling for DVB is specified in ETSI ETS 300 743.

Subtractive Color System – Color specification system in which primary colors are subtracted from a reference color to achieve a desired color. Examples include the cyan/magenta/yellow (CMY) and luminance/red – luminance/blue – luminance (Y, R-Y, B-Y) systems.

Super – See Title.

Super 16 – The 16mm film stock produced for a special format with an enlarged picture area. Super 16 is designed to be printed to 35 mm film for release.

Super Black – Keying signal that is embedded within the composite video signal as a level between black and sync. It is used to improve luma self-keying because the video signal contains black, making a good luma self-key hard to implement. Where the downstream keyer detects the super black level, it inserts the second composite video signal. See Blacker-than-Black.

Super NTSC – An ATV scheme proposed by Faroudja. It combines progressive scanning, pre-filtering, pre-combing, image enhancement, and gamma correction at the transmission end with complementary processing and line doubling at the receiver. It is both channel-compatible and receiver-compatible and is one of the few ATV schemes that keep an aspect ratio of 12:9.

Super VHS – S-VHS is an enhancement to regular VHS video tape decks. S-VHS provides better resolution and less noise than VHS. S-VHS video tape decks support separate luma (Y') and chroma (C) video inputs and outputs, although this is not required. It does, however, improve the quality by not having to continuously merge and then separate the luma and chroma signals.

Superimpose (Super) – To place in front of video, e.g., placing text over a video signal.

Superimposition (or Super) – a) Two images simultaneously picked up by two different cameras and electronically mixed on the face of a kinescope tube in such a manner that both images are visible. **b)** A film term describing the mixing of two or more video sources such that they appear to be overlaid.

Superstation – Local television station whose signal is retransmitted via satellite to cable systems beyond reach of over-the-air signal.

Superuser – An alternate name for the user of the root login account. See also System Administrator.

Sup-Picture – A simple picture intended to be superimposed over the video. Display size varies but is bound to CCIR 601 picture dimensions (720 x 480 for NTSC-rate displays or 720 x 576 for PAL-rate displays).

Supply Turntable – The turntable which feeds tape to the heads of a tape deck.

Surface – A set of one or more patches which have been connected together.

Surface Asperities – Small, projecting imperfections on the surface of the coating that limit and cause variations in head-to-tape contact. A term useful in discussions of friction and modulation noise.

Surface Properties – To allow more realism to 3D models, the surfaces of an object can have distinctive attributes or properties: ambient light, diffuse light, transparency, texture (these four in PictureMaker). Other systems have other properties such as true metallic versus plastic (or other material) surface types.

Surface Treatment – Any process by which the surface smoothness of the tape coating is improved after it has been applied to the base film.

Surge Protector – An electronic device which protects electronic equipment from power fluctuations.

Surround Channels – Audio presentation channels (LS and RS) added to the front channels (L and R or L, R, and C) to enhance the spatial perception.

Surround Sound – This usually implies an audio system with more than two channels of information. The additional channels provide "ambiance" or sound information that is happening somewhere other than from the left or right speaker.

SVCD (Super VideoCD) – Next generation VideoCD, defined by the China National Technical Committee of Standards on Recording, that hold 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 rate) 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. IEC 62107 defines the Super VideoCD standard. XSVCD, although not an industry standard, increases the video resolution and bit rate to improve the video quality over SVCD. MPEG-2 video is still used, with a resolution of 720 x 480 (29.97 Hz frame rate) or 720 x 576 (25 Hz frame rate). Variable bit-rate encoding is still used, with a maximum bit rate of 9.8 Mbps.

SVG (Scalable Vector Graphics) – A language for describing two-dimensional graphics and graphical applications in XML.

SVGA (Super Video Graphics Array) – SVGA is an enhanced version of VGA and supports higher-resolution and higher-color modes. SVGA has become the current standard because it supports video modes that do a better job of reproducing realistic images. See also VGA.

S-VHS (Super VHS) – a) An improved version of the VHS tape format capable of recording better picture resolution (definition). A higher-density tape is required which provides a wider luminance bandwidth, resulting in sharper picture quality (> 400 horizontal lines vs. 240 for standard VHS)

and improved signal-to-noise ratio. Because the equipment is usually smaller and lighter than 3/4" equipment, it is ideally suited for ENG/EFP applications. **b)** Super VHS, a consumer videotape format offering horizontal resolution somewhat greater than that offered by NTSC broadcasting but allowing component recording and playback without cross-luminance or cross-color artifacts through a four-pin S-Video connection.

SVHS, S-VHS – See Super VHS.

S-VHS-C (Super VHS-C) – An improved version of the VHS-C tape format capable of recording better picture resolution (definition).

S-Video (Separated Video) – The standard for the way a signal is carried on the cable itself. The industry has settled on a 4-pin mini plug connector. S-Video does not have any relation to the resolution or refresh rate of the signal. Do not confuse S-Video with S-VHS. S-VHS is a tape/signal standard. S-Video is a hardware standard that defines the physical cable jacks. S-Video allows you to bypass the comb filter in a device. Generally, less processing of the signal results in a better picture. The comb filter separates the chroma (color) and luma (brightness) components of a video signal into separate parts. This is also called Y/C, where Y represents brightness and C color. When color and brightness are not separated, when they are combined in the signal, it is called a composite signal. S-Video cables have separate wires for the color and brightness. That is, they carry a Y/C signal. The best picture comes when the color and brightness is separate from the source. VCRs record this way, and DSS broadcasts this way too. Laserdiscs store a composite picture rather than Y/C separated. Even when the signals have been combined at some point on their way to the monitor, different comb filters perform to different degrees of quality, so one can pick how to connect one's components to try to use the best comb filter. Some older sets with S-Video input jacks may actually combine the Y/C in a crude way, making the S-Video input no better than a typical composite signal. Newer sets probably do not do this anymore.

SVM – See Velocity Scan Modulation.

Swap Shot – An insert edit where the segment of an edit sequence that lies between two transitions is swapped for the incoming source clip. Swap shots ripple, meaning the edit sequence duration changes if the source clip is of a different length than the segment it replaces.

Sweep Signal – A sweep signal allows you to examine the frequency response continuously over the interval of interest rather than at only discrete frequency intervals as tested by the multiburst or multiphase signals. Line rate and field rate sweep signals can be used to measure the frequency response of a system. In a sweep signal, the frequency of the waveform is continuously increased over the length of the line or field. The Sweep signal however cannot be used for VITS thus is limited to out of service testing. See the Frequency Response discussion.

Sweetening – a) The final combining and enhancing of a video program's audio tracks. **b)** Electronically improving the quality of an audio or video signal, such as by adding sound effects, laugh tracks, and captions.

Switched Network – Any site in a network may be connected temporarily to any other site in the network.

Switcher – General term for a device used to select different signals (audio, video or RF) from various sources. See Video Switcher.

Switching – a) The process of connecting and routing digital data on a network. **b)** The editing and splicing together of program segments.

SXGA – A video graphics resolution of 1280 x 1024 pixels.

Symmetrical Compression – A compression system which requires equal processing capability for compression and decompression of an image. This form of compression is used in applications where both compression and decompression will be utilized frequently. Examples include: still-image databasing, still-image transmission (color fax), video production, video mail, videophones, and videoconferencing.

Symmetrically, Cyclically, Magnetized Condition – A magnetic material is in this condition when, using the influence of a magnetizing field cycled between equal but opposite values, its successive hysteresis loops coincide.

Symmetry – An adjustment that allows distortion of the aspect ratio of a pattern.

Sync – a) Abbreviation for synchronization. Usually refers to the synchronization pulses necessary to coordinate the operation of several interconnected video components. When the components are properly synchronized, they are said to be "in sync". **b)** Signals which control the sweep of the electron beam across the face of the display. The horizontal sync, or HSYNC for short, tells the display where to put the picture in the left-to-right dimension, while the vertical sync (VSYNC) tells the display where to put the picture from top-to-bottom. **c)** The portion of an encoded video signal which occurs during blanking and is used to synchronize the operation of cameras, monitors, and other equipment. Horizontal sync occurs within the blanking period in each horizontal scanning line, and vertical sync occurs within the vertical blanking period.

Sync Buzz – A noise containing harmonics of 59.94 Hz, heard on television set speakers under certain signal and transmission conditions. One such condition is the transmission of electronically generated characters of high level and resolution greater than can be carried in NTSC. The ringing resulting when those signals hit an NTSC filter causes the television carrier to momentarily disappear. Since the characters are within a television field, the rate of appearance and disappearance is a multiple of the field rate, 59.94 Hz.

Sync Code – A code in a bit stream that identifies the start of a layer of data.

Sync Compression – The reduction in the amplitude of the sync signal, with respect to the picture signal, occurring between two points of a circuit.

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

Sync Generator – a) Circuit that provides sync signals. A sync generator may or may not have genlock capability. **b)** Device that generates synchronizing pulses needed by video source equipment to provide proper equipment video signal timing. Pulses typically produced by a sync generator could be sub-carrier, burst flag, sync, blanking, H and V drives and color black. Most commonly used in CCTV are H and V drives.

Sync Layer (SL) – A layer to adapt elementary stream data for communication across the stream multiplex interface, providing timing and synchronization information, as well as fragmentation and random access information. The Sync Layer syntax is configurable and can also be empty.

Sync Layer Configuration – A configuration of the Sync Layer syntax for a particular elementary stream descriptor.

Sync Layer Packet (SL-Packet) – The smallest data entity managed by the Sync Layer consisting of a configurable header and a payload. The payload may consist of one complete access unit or a partial access unit.

Sync Level – The level of the tips of the synchronizing pulses.

Sync Noise Gate – Circuit used to define an area within the video waveform where the sync stripper is to look for the sync pulse.

Sync Pulse – Timing pulses added to a video signal to keep the entire video process synchronized in time.

Sync Restoration – A process which replaces distorted and missing sync information by checking incoming sync, analyzing the frequencies involved and generating new fully restored sync.

Sync Stripper – Circuit which removes the sync information from the composite signal.

Sync Tip – The level or duration of the most negative excursion of a sync pulse from blanking level.

Sync to Blanking End – Refer to the Horizontal Timing discussion.

Sync to Burst End – Refer to the Horizontal Timing discussion.

Sync to Subcarrier Time Base Error – A random variation in the phase relationship between sync and subcarrier.

Sync Word – A synchronizing bit pattern which is different from the normal bit stream pattern for purposes of synchronization or clocking. Synchronizing words usually consist of unique bit patterns which are easily recognized as a clock or sync signal. Sync words are used for framing in serial receivers.

Synchronization – The maintenance of one operation in step with another. The precise coincidence of two or more sync pulses.

Synchronization Word – a) A synchronizing bit pattern differentiated from the normal data bit patterns, used to identify reference points in the television signal; also to facilitate word framing in a serial receiver. **b)** A fixed pattern of bits inserted in a binary message for the purpose of synchronizing the message interpreting unit.

Synchronize – To make information operate together at the same correct time.

Synchronized – To happen at the same time.

Synchronizer – Device that ensures audio and video signals from varying sources are coordinated by timing them against a reference signal and advancing or delaying them as needed.

Synchronizing Pulse Generator – Equipment that generates synchronizing pulses needed by source equipment. Also called sync generator or SPG.

Synchronous – A transmission proce-dure by which the bit and character stream are slaved to accurately syn-chronized clocks, both at the receiving and sending end.

Synchronous Data Streaming – a) Streaming of data with timing requirements in the sense that the data and clock can be regenerated at the receiver into a synchronous data stream (i.e., E1, T1). **b)** Streaming of data with timing requirements in the sense that the data within the stream can be played back in synchronization with other kinds of data streams (e.g., audio, video). See Asynchronous Data Streaming, Synchronous Data Streaming.

Synchronous Detection – A demodulation process in which the original signal is recovered by multiplying the modulated signal with the output of a synchronous oscillator locked to the carrier.

Synchronous Motor – A motor with speed controlled by the frequency of the applied voltage.

Syncro-Edit – Wired control protocol which activates/deactivates a VCR's record pause function. Many non-compatible versions of this protocol exist.

Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs (SCART) – A 21-pin connector for European audio/video consumer products. It supports mono/stereo audio, composite video, s-video, and RGB video to be transmitted between equipment.

Syndrome – Initial result of an error checking calculation. Generally, if the syndrome is zero, there is assumed to be no error.

Syntactic Decoded Audiovisual Objects (Syntactic Decoded AV Objects) – The representation of the AV object that is optimized for the needs of the Decompression Layer as is goes out of the Syntactic Decoding Layer.

Syntactic Decoding Layer – The MPEG-4 Systems Layer that identifies and extracts from elementary streams syntactic elements and maps them to semantic elements to produce the syntactic decoded audiovisual object.

Syntactic Description Language (SDL) – A language defined by the MPEG-4 systems specification that allows the description of a bitstream's syntax.

Syntactic Element – An information unit whose syntax is known. The syntax of an information unit is either pre-defined by the standard, or transmitted using the syntactic description language.

Syntax – a) The description of the binary format of an information unit. **b)** The rules governing construction or formation of an orderly system of information. For example, the syntax of the MPEG video encoding specification defines how data and associated instructions are used by a decoder to create video pictures.

Synthesis Filterbank – Filterbank in a decoder that reconstructs a signal from sub-band samples such as in audio algorithms.

Synthesizer – An analog or digital generator which can produce any wanted frequencies or sounds.

Sysinfo – The program used to retrieve the system identifier of your Silicon Graphic workstation.

System – An organized assembly of equipment, personnel, procedures and other facilities designed to perform a specific function or set of functions.

System Administration – The tasks associated with setting up, maintaining, and troubleshooting a networked or stand-alone workstation or a network of workstations.

System Administrator – The individual responsible for setting up, maintaining, and troubleshooting a network of workstations. The system administrator uses the root login account to perform most administrative tasks.

System Clock Reference – See SCR.

System Crash – When the operating system fails and the system will not accept keyboard or mouse input.

System Disk – The physical disk that contains the standard operating system software, the software that makes a workstation run.

System Gamma – The overall light-in/light-out characteristic of a television system, from camera through receiver. In an ideal system, the gamma should be one. In practice, it appears to be about 1.4.

System Header – The system header is a data structure that carries information summarizing the system characteristics of the Digital Television Standard multiplexed bit stream.

System Manager – A set of tools that the administrator uses to set up and manage the IRIS. You access the System Manager through the System Toolchest.

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

System Software – The standard operating system software and tools that come on the system disk and on the tape or DC-ROM that you use in the event of a system crash.

System Target Decoder – See STD.

System Time Base (STB) – The time base of the terminal. Its resolution is implementation-dependent. All operations in the terminal are performed according to this time base.

System Toolchest – The toolchest in the upper left-hand corner of the screen labeled System. You start system tools such as the Workspace and System Manager using its menu.

Systems Decoder Model (SDM) – A model that provides an abstract view of the behavior of a terminal compliant to this specification. It consists of the buffering model and the timing model.

▶ T

T – Abbreviation for tele- or symbol for time.

T Intervals – See the definition of Sine-Squared Pulses.

T Steps – See the definition of Sine-Squared Pulses.

T.120 – a) T.120 is an ITU-T standard (International Telecommunications Union) for document conferencing. Document conferencing allows two or more people to concurrently view and edit a document across a network. **b)** T.120 is the commonly used name to refer to a family of distinct standards. Many video conferencing companies were developing their own implementations of this until Microsoft released its free NetMeeting software. Now, many companies are using NetMetting, while perhaps enhancing it in some way. c) A set of specifications for multipoint communications and data sharing for PC platforms. T.120 is based on the H.320 broad-based PB platform standard for Personal Teleconferencing.

T1 – a) In telecommunications, the pared cable used to transport DS-1 service. **b)** A digital transmission link with a capacity of 1.544 Mbps. T1 uses two pairs of normal twisted wires. T1 lines are used for connecting networks across remote distances. Bridges and routers are used to connect LANs overT1 networks.

T1 Channel – North American digital transmission channel with a data rate of 1.544 Mbps which is made up of 24 channels of 64 kbps each (DS1).

T1Q1.5 – The T1Q1.5 Video Teleconferencing/Video Telephony (VTC/VT) ANSI Subworking Group (SWG) was formed to draft a performance standard for digital video. Important questions were asked, relating to video digital performance characteristics of video teleconferencing/video telephony: **a)** Is it possible to measure motion artifacts with VTC/VT digital transport? **b)** If it can be done by objective measurements, can they be matched to subjective tests? c) Is it possible to correlate the objective measurements of analog and digital performance specification? The VTC/VT Subworking Group's goal is to answer these questions. It has become a first step to the process of constructing the performance standard.

T3 Channel – A 44.736 Mbps North American digital channel (DS3).

Table – a) Collection of data in a form suitable for ready reference, frequently stored in sequential memory locations. **b)** A table is comprised of a number of sub_tables with the same value of table_id.

Table Look-Up – Obtaining a value from a table of values stored in the computer.

Taboos – Empty channel spaces in the frequency allocation table to which broadcast channels cannot be assigned due to potential interference. The most obvious one is the co-channel taboo: two different television or radio stations cannot operate on the same frequency in the same geographical area. Other taboos cover geographical spacing for adjacent channels and for "images" (spurious frequencies akin to aliases) that are caused by reception in existing television sets. The taboos effectively knock out much of the UHF television band, so some ATV proponents wonder whether they might be too strict.

Tachometer – A device which counts the number of revolutions per second of a motor or other rotating device.

Tag – The tag forms the most important part of a cache directory entry. Using the tag, the cache controller determines whether a cache hit or miss occurs. The tag holds the address of the assigned cache line.

TAI (International Atomic Time) – An international time standard. It is calculated by the Bureau International des Poids et Mesures (BIPM) from the readings of more than 200 atomic clocks located in metrology institutes and observatories in more than 30 countries around the world.

Tail – Video or audio material that has been trimmed out of the back (trailing) end of a clip.

Tails Out – A way of winding tape such that the end of the selection is at the outside of the reel.

Take – a) A cut that takes place on air. Also, the flip or flip-flop of sources on a preset/program style switcher. **b)** When a particular scene is repeated and photographed more than once in an effort to get a perfect recording of some special action, each photographic record of the scene or of a repetition of the scene is known as a "take".

Takeup Reel – The reel on the tape recorder that accumulates the tape as it is recorded or played.

Takeup Turntable – The turntable which takes up the tape after it passes by the heads.

Talent – A term used to refer to on-camera subjects in a video production.

Talker – Device that outputs data to a data bus. A ROM is a talker.

Tally – a) An indication of all sources that are contributing to a switcher's final output at any given time. **b)** A light which lights up to indicate that the associated push-button has been selected or to indicate that the associated input to the switcher is on-air. **c)** A relay closure to activate a remotely situated lamp, i.e., on top of a camera, to warn the production crew which camera in on-air. Most monitor have tally lights and common practice is to connect them to the switcher tally output so that the director can see which source is on-air.

Tally Lamp – A signal lamp or LED installed on a video camera which informs performers and crew members that the camera is currently live.

Tally Relay – Contacts provided on the switcher to allow users to activate tally lamps on cameras, monitors, and otherwise indicate what sources are on air.

Tangential Signal to Noise Measurement Method – This is one method of measuring a signal's signal to noise ratio. It requires a waveform monitor such as the 1780R. Refer to the 1780R operator's manual for a complete description of the signal to noise measurement technique.

Tape – A tape with a magnetizable layer on which data can be stored. Usually a workstation's tape is packaged in a cartridge.

Tape Delay – Using magnetic tape as a storage medium for a brief period of time to delay the playback of a signal. Delay time equals the distance between the record and playback heads divided by the tape speed.

Tape Drive – A mechanism for controlling the movement of magnetic tape, commonly used to move magnetic tape past a read head or write head, or to allow automatic rewinding.

Tape Guides – Grooved pins or rollers mounted between and at both sides of the tape head assembly to position the magnetic tape correctly on the head as it is being recorded or played.

Tape Lifters – A system of movable guides that automatically prevents the tape from contacting the recorder's heads during fast forward or rewind modes of operation, thus preventing head wear.

Tape Loop – A length of magnetic tape with the ends joined together to form an endless loop. It makes possible the repetitive playback of a recording without rewinding the tape.

Tape Pack – The form taken by the tape wound on to a reel. A good pack is one that has a uniform wind, has an acceptable E-value and is free from spoking, cinching and layer-to-layer adhesion.

Tape Player – A unit that is not capable of recording and is used only for playing recorded tapes.

Tape Skew – The deviation of a tape from following a linear path when transported across the heads, causing a time displacement between signals recorded on different tracks and amplitude differences between the outputs from individual tracks owing to variations in azimuth alignment. The adjectives static and dynamic are used to distinguish between the steady and fluctuating components of tape skew.

Tape Speed – The speed at which tape is transported from feed (supply) to takeup reels during normal recording or reproduction.

Tape Speed Override (TSO) – Allows the editor to manually control the capstan speed of the selected transport + and -10% using the joystick. TSO is especially important when tape machines need to be exactly synchronized before finalizing an edit. If audio monitors for all transports are left up, the edit point on the transport can be selected by listening for the audio echo and adjusting the transport speed until the machines are in exact synchronization.

Tape Transport – The mechanism that extracts magnetic tape from a storage device, moves it across magnetic heads at a controlled speed, and then feeds it into another storage device. Typical storage devices are tape loops, bins, reels and magazines (cassettes, cartridges). The tape transport is one part of a magnetic tape recorder/reproducer system that normally consists of: magnetic heads, magnetic tape, Tape transport, record electronics, reproduce electronics.

Tape-to-Head Speed – The relative speed of tape and head during normal recording or replay. The tape-to-head speed coincides with the tape speed in conventional longitudinal recording but is considerably greater than the tape speed in systems where the heads are scanned across or along the tape.

Target – A picture monitor displaying ADO video output can be thought of as a window which reveals a finite area of target space.

Target (Menu) – The 2D function that moves or sizes the image on the 2D plane, which is "Target Space". In 3D systems, Target is used to move an image without perspective and to "fine tune" an effect.

Tariff – Common carrier's statement describing services it offers and rates it charges.

T-Axis – Time axis of the spatio-temporal spectrum.

TBC – See Time Base Corrector.

TCOR (Technical Corrigendum) – Errata and corrections to an existing standard or amendment. See also AMD.

TC8QSK (Trellis-Code Eight-Phase Shift Keying)

TCM (Trellis Coded Modulation) – A technique that adds forward error correction to a modulation scheme by adding an additional bit to each baud.

TCP (Transport Control Protocol) – The major transport protocol in the Internet suite of protocols providing reliable, connection-oriented, full-duplex streams. Uses IP for delivery.

TCP/IP – The standard networking software that is included in the system software.

TDAC (Time Domain Aliasing Cancellation) – A coding technique used in AC-3 audio compression.

TDF – See Telediffusion de France and Time Division Frequency.

TDL (Telecine Decision List) – A list of the edits made in a telecine session which can be loaded into an off-line editor.

TDM – See Time Division Multiplex.

TDMA (Time Division Multiple Access) – The multiplexing of multiple calls onto single channel on a single carrier by splitting the carrier into time slots and thus supporting multiple channels.

TDT – See Time and Data Table.

TDT (Transponder Data Table)

Tear Strength – The force, usually in gm, required to initiate and/or propagate a tear in a specially shaped specimen of tape or base film.

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.

Telecine – A term used to describe a device used to convert film to video. In advanced telecine machines, the movie film is digitally sampled and converted to video, frame by frame in real-time. Frame rate is the biggest problem encountered in film-to-video conversion. Movie film has a frame rate of 18, 24 or 30 fps (frames per second) contrasting with the 30 and 25 fps video frame rates of NTSC and PAL respectively. See Flicker.

Telecine Artist – The operator of a telecine machine. Also called a Colorist.

Telecine Decision List (TDL) – A list of the edit made in a telecine session which can be loaded into an offline editor.

Teleconferencing – Two or more people who are geographically distant having a meeting of some sort across a telecommunications link. Includes audio conferencing, video conferencing, and/or data conferencing.

Telediffusion de France (TDF) – A proponent of the French proposals.

Telemetry – The system by which a signal is transmitted to a remote location in order to control CCTV equipment e.g., to control pan and tilt and zoom functions, switch on lights, move to preset positions. The controller at the operating position is the transmitter and there is a receiver at the remove location. The signal can be transmitted along a simple "twisted pair" cable or along the same coaxial cable that carried the video signal.

Teleprompter – A device for displaying large, readable text on a partially transparent screen for video production. The teleprompter uses a monitor mounted under the camera lens, facing up, and a mirrored glass which reflects the monitor's image toward the talent. Since the camera shoots through the mirrored glass and the mirrored glass is transparent to the camera, the talent can look directly into the camera lens as they read the script from the glass.

Teletext – A method of transmitting data with a video signal. ITU-R BT.653 lists the major teletext systems used around the world. World System Teletext (WST) is system B; North American Broadcast Teletext Specification (NABTS) is 525-line system C.

TeleText – An information service of 200-700 "pages" covering a wide range of topics including TV Schedules, News, Financial Market prices, Comment, Reviews, Concert & Theater information. Subtitles are typically transmitted on page 888 in the UK, on pages 199/299/399 in Belgium and Holland, on page 150 in Germany and on page 777 in Italy. There are a number of variant character sets used, but the encoding is identical and all English alphabet characters plus numbers and most punctuation can be handled by any decoder. Includes support for 8 colors, and limited block graphics, and selective revealing of underlying TV picture. Transmitted on a variable number of lines (specified in header which contains basic information such as time, date and channel), starting on line 12 and continuing for 7-8 lines typically. Found on broadcasts and some Laserdiscs; recording of TeleText signals is marginal on S-VHS, almost impossible on VHS hence the PAL/625 version of CC.

Television – A combination tuner, RF demodulator, picture tube, and audio speaker that converts RF signal into picture and sound.

Television, Broadcast – Generally refers to terrestrial radiation of television signals in one or more of the frequency bands defined by CCIR (and in the U.S. reaffirmed by the FCC). The U.S. has 59 television channels, each 6 MHz wide, for video plus correlated audio.

Television, Digital (for Studios) – An extensive family of compatible digital coding standards for studio use with current television systems is defined by CCIR Red 601-2, equally applicable to component encoded 525/60 Hz and 625/50 Hz systems. The member of the family to be used for the standard digital interface between main digital studio equipment and for international program exchange (i.e., for the interface with video recording equipment and for the interface with the transmission system) should be that in which the luminance and color-difference sampling frequencies are related in the ratio 4:2:2. Specifications include: Coded Signals: luminance (Y) plus two color-difference signals (CR and CB); Sampling Frequency: luminance 13.5 MHz, color-difference 6.75 MHz (for each of the two signals); Samples (8-bit) per Digital Active Line: luminance 720, color-difference 360 (for each of CR and CB). Other more detailed specification details are included in CCIR Rec 601-2. Compressed and expanded derivations (4:1:1 and 4:4:4 specifically) are postulated variants with minimum or maximum color information.

Television, Digital Component – A signal format in which either the tristimulus value red (R), green (G), and blue (B) signals representing the picture contents or a matrixed version consisting of the luminance (Y) and two color-difference signals (R Y, L3 Y) – are individually digitized and combined into a single data stream. SMPTE 125M describes a digital component television signal interface for 525-line/59.94 field/sec television systems. Specifications for digital magnetic video tape recording of component digital video of 525-line or 625-line structure sampled at 13.5 MHz are grouped into the D1 VTR standards. For 525-line, samples at 13.5 MHz, the specifications are SMPTE 224M, 225M, 226M, 227M, RP 155, and EG 10. An index to the specifications for D1, both 525-line and 625-line versions, is SMPTE EG 22.

Television, Digital Composite – A signal format in which the signal matrix representing the picture contents consisting of the luminance and the two color-difference signals modulated on a color subcarrier are digitized in the matrixed form as a single data stream. SMPTE 244M describes a digital composite television signals interface for 525-line/59.94 field/sec television systems. Specifications for digital magnetic video tape recording of composite digital video of 525-line or 625-line structure are grouped into the D2 VTR standards. For 525-line, sampled at 14.32 MHz, the specifications are SMPTE 245M, 246M, 247M, 248M, EG 20 and RP 155. An index to the specifications for D2 is SMPTE EG 22.

Television, Digital HDTV – An extensive family of compatible digital coding standards for studio use with high-definition television is under study and test by the SMPTE Committee on Television Signal Technology (S17). Digital representation of the 1125/60 system is documented in SMPTE 260M.

Television, Enhanced (ETV or EDTV) – The term enhanced television designates a number of different improvements applicable to 525/60 Hz and 625/50 Hz television systems. They include all television systems not specified in CCIR Report 624-4, Characteristics of Television Systems and Report 801-4, The Present State of High-Definition Television, either with unchanged or new radiation standards and without specification of aspect ratio.

Television, High-Definition (HDTV) – A high-definition television system is a system designed to allow viewing at about three times the picture height, such that the system is virtually, or nearly, transparent to the quality of portrayal that would have been perceived in the original scene or performance by a discerning viewer with normal visual acuity. Such factors include improved motion portrayal and improved perception of depth. A high-definition system generally implies in comparison with conventional television systems: spatial resolution in the vertical and horizontal directions of about twice that available in CCIR Red 601-2; any worthwhile improvements in temporal resolution beyond that achievable with CCIR Red 601-2; improved color rendition; a wider aspect ratio; multichannel high-fidelity sound.

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

Temporal Aliasing – a) A visual defect that occurs when the image being sampled moves too fast for the sampling rate. A common example is wagon wheels that appear to rotate backwards. **b)** An alias caused by violation of the Nyquist limit on sampling in time with frames.

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. See also Codec.

Temporal Encoding – The phenomenon that happens when a loud sound drowns out a softer sound that occurs immediately before or after it.

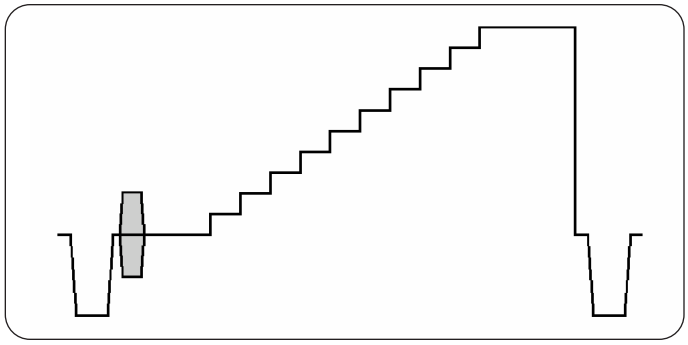
Temporal Prediction – Prediction derived from reference vops other than those defined as spatial prediction.

Temporal Resolution – The finest moments of time that can be perceived in a particular system. It is not the same as dynamic resolution, which is spatial resolution when an image is changing. As an example, suppose a spoked wheel is turning. If the spokes are a blur when the wheel is not turning, the system has poor static resolution; if they are clear, it has good static resolution (for the spokes). If they are a blur when the wheel is turning, the system has poor dynamic resolution and poor temporal resolution. If they are clear when the wheel is turning, the system has good dynamic resolution. If, though clear, they appear to be stationary, or turning in the wrong direction, or turning at the wrong speed, or flashing rapidly in different positions so it is impossible to tell which way or at what speed they are turning (a temporal blur), the system has poor temporal resolution. A great deal of evidence indicates that the human visual system cannot simultaneously perceive high spatial resolution and high temporal resolution.

Temporal Scalability – A type of scalability where an Enhancement Layer also uses predictions from pel data derived from a lower layer using motion vectors. The layers have identical frame rates size, and chroma formats, but can have different frame rates.

Ten-Step Staircase – Test differential gain/phase and luminance linearity. Used in ENG/EFP, studio and distribution.

Tera (T) – An SI prefix for denominations of one trillion (1012).



Terabyte – 1 trillion bytes. A 2-hour HDTV movie at the maximum resolution of 1920 x 1084 would take about 1 terabyte to store in an uncompressed format.

Terminal – a) A computer interface comprised of a monitor, keyboard and usually some memory. **b)** A system that receives and presents the coded representation of an interactive audiovisual scene as defined by this specification. It can be a standalone system, or part of an application system that supports presentation of content complying with this specification.

Terminal End Station – A terminal end station is the client endpoint that provides real-time, two-way communications.

Terminating Resistor – A resistor (usually 75 ohms) attached to the end of a cable or to an input or output on a piece of video equipment. The resistor restores proper system impedance.

Termination – In order to accurately send a signal through a transmission line, there must be an impedance at the end which matches the impedance of the source and the line itself. Amplitude errors and reflections will otherwise result. Video is a 75 ohm system, so a 75 ohm terminator must be put at the end of the signal path.

Termination Switch – A switch that connects and disconnects a load resistance to a video input, used to terminate the line. In order for a video signal to be correctly transmitted without loss, proper end of line impedance is essential. Amplitude errors and reflections will otherwise result. A 50 or 75 ohm resistor is usually employed to accomplish this. When the termination switch is off, the unterminated video signal is looped to the next device where the signal can be transmitted in parallel. The final device in the chain must be terminated using the termination switch.

Terrestrial Broadcasting – A broadcast signal transmitted "over-the-air" from a ground-based transmitter to an antenna.

Terrestrial Transmission Standards

Code	Frames	Scan Lines	Frequency Band	Sound Offset	In Use
Terrestrial Transmission Standards					
A	25	405	VHF	–3.5 MHz	No
B	25	625	VHF	+5.5 MHz	Yes
C	25	625	VHF	+5.5 MHz	Yes
D	25	625	VHF	+6.5 MHz	Yes
E	25	819	VHF	+11 MHz	No
F	25	819	VHF	+5.5 MHz	No
G	25	625	UHF	+5.5 MHz	Yes
H	25	625	UHF	+5.5 MHz	Yes
I	25	625	UHF	+6.0 MHz	Yes
K	25	625	UHF	+6.5 MHz	Yes
KI	25	625	UHF	+6.5 MHz	Yes
L	25	625	UHF	+6.5 MHz	Yes
M	30	525	VHF/UHF	+4.5 MHz	Yes
N	25	625	VHF/UHF	+4.5 MHz	Yes
Satellite Transmission Standards					
Ku-Band	Any	Any	~11 GHz	+6.50 MHz	Yes
C-Band	Any	Any	~4 GHz	+6.50 MHz	Yes

Terrestrial Virtual Channel Table (TVCT) – The ATSC table that identifies a set of one or more channels in a terrestrial broadcast. For each channel, the TVCT indicates major and minor channel numbers, short channel name, and information for navigation and tuning.

Tessellated Sync – Europeans designation for serrated sync. See Serration Pulses and Sync.

Test Pattern – A chart with special patterns, placed in front of a television camera to generate a known reference signal that can be used to adjust the camera and all the equipment downstream from the camera.

Test Signal Generators – These instruments provide a variety of known test and synchronization signals for the characterization of television systems.

TEV (Target Error Vector) – In a constellation diagram, the distance between the ideal symbol point location and the point corresponding to the mean of the cloud of that particular point, is referred to as TEV.

Text Box – Used to enter text.

Text Mode – A graphics adapter mode where only the characters of a certain character set can be displayed on the monitor. The pixels cannot be addressed individually and are generated by a hardware character generator.

Texture Map – A texture map is a 2D image that can be created with a paint program such as AVA3 or TIPS, or scanned into a frame buffer from a video source, and then mapped onto the surface of a 3D object. ADO effects are a simple, real-time, on-line version of this general process.

Texture Mapping – Texture mapping is made possible by full color mode. Texture mapping refers to the process of covering the surface of a polygon with values what come from a "texture" that come from some picture stored elsewhere in the system, say a scanned in image.

TF1, TF2 (DVB-RCT Transmission Frames)

TFT (Thin-Film-Transistor) – This technology is used mainly for manufacturing flat computer and video screens that are superior to the classic LCD screens. Color quality, fast response time and resolution are excellent for video.

TGA – The TARGA file format (TGA) and TARGA board were developed for graphics prior to the advent of large-screen, super VGA displays.

THD (Total Harmonic Distortion)

Thermal Recalibration – When a hard disk heats up, its platters expand in size. As a result of this, a hard disk has to compensate for changes in data position by performing a thermal recalibration function. This can cause interruptions in data flow which would delay video output. This problem is commonly solved by using a data buffering system.

Thin – As applied to a photographic image, having low density.

Thomson – Major French electronics firm that recently purchased GE/RCA Consumer Electronics and previously purchased German consumer electronics interests, the latter sometimes referred to as International Thomson. Through its GE/RCA holdings, Thomson is a proponent of the ACTV ATV schemes; through International Thomson, it has proposed progressive schemes. Thomson also sells television production equipment and for a time owned the production equipment branch of CBS Laboratories, then called Thomson-CSF Laboratories.

Three-Point Editing – In Adobe Premiere, the feature that enables editors to 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 where the clip is being inserted, are known.

Three-State – Logic device whose output can be placed into a high-impedance (off) state, in addition to the usual high and low states. This feature allows more than one device output to be connected to the same logic node. Three-state operation is a fundamental requirement for devices used on microprocessor data buses. Same as Tri-State™.

Three-Wire Interconnect – Interconnect consisting of three wires. One wire transports luminance while the other two wires each transport a color difference signal. This system is commonly used for connecting equipment in a "component facility" because it is more compatible with non-VTR video sources, time base correctors, displays and monitoring equipment.

Threshold of Feeling – The sound pressure level at which people feel discomfort 50% of the time. Approximately 118 dB SPL at 1 kHz.

Threshold of Hearing – The sound pressure level at which people hear only 50% of the time. Approximately 0 dB SPL at 1 kHz.

Threshold of Pain – The sound pressure level at which people feel actual pain 50% of the time. Approximately 140 dB SPL at 1 kHz.

Throughput – Speed with which problems or segments of problems are performed. Throughput will vary from application to another.

Thumbscrew – The ridged knob attached to a screw in a cable connector that you turn to secure the connector to an outlet.

Thunk – Thunk refers to the byte-shuffling that occurs when 32-bit code must communicate with 16-bit code.

Tier – A package of television channels offered to customers for a single price. Most cable systems have more than one tier, e.g.. a "basic" package including local broadcast stations, and one or more "expanded" tiers featuring popular cable program networks. In addition, cable operators offer "premium" subscription services such as HBO and Showtime and "pay-per-view" events such as movies, boxing matches and concerts.

TIF – A file format (tagged image format file) preferred over the bitmap (BMP) file format for Windows applications. TIF files may be compressed or uncompressed and contain a header similar to BMP files. A special version of TIF is used for compressed data FAX transmission.

TIFF (Tag Image File Format) – The standard file format for high-resolution bit-mapped graphics, especially from scanners.

TIFF-EP (Tag Image File Format for Electronic Photography) – A version of TIFF file format used by Kodak digital cameras to store non-image data with many different types of image data.

Tile – A transition in which one image is gradually replaced by another image that appears part-by-part in successive squares. The squares follow a given pattern until the entire screen is filled with the new image.

Tiling – A technique for displaying high-resolution images that divides images into portions (tiles) and loads the portions into memory as needed for display on screen.

Tilt – a) Term used for camera movement in an up and down mode. **b)** A mechanical measurement of the warp of a disc. Usually expressed in radial and tangential components: radial indicating dishing and tangential indicating ripples in the perpendicular direction.

Timbre – The harmonic content of a tone and the relative intensities of the different harmonics.

Time and Control Code – a) SMPTE 12M – A digital code recorded by video and audio magnetic tape recorders, identifying each frame with a unique and complete address. Unassigned bits permit limited production identification. The time and control code was developed for 525-line/60-field systems. An international version compatible with SMPTE 12M is described in IEC Publication 461. Variants have evolved for 24- and 25-frame systems. **b)** Cinematography – A digital code format applicable to motion-picture film at 24, 25 or 30 frames/sec. Two types are described: Type C, a continuous code very similar to SMPTE 12M and IEC Publication 461 to be read from continuously moving film, and Type B, a non-continuous block-type code for intermittently moving film, but still decodable with the same type of electronic equipment used to read Type C.

Time and Data Table (TDT) – A mandatory DVB SI table that supplies the UTC time and date. This table enables joint management of events corresponding to services accessible from a single reception point.

Time Base – The notion of a clock; it is equivalent to a counter that is periodically incremented.

Time Base Corrector (TBC) – a) Device used to correct for time base errors and stabilize the timing of the video output from a tape machine. Machines like VHS players where a single pass of the video head represents many video lines are particularly susceptible to tape stretch, jitter, and speed variations which cause some recorded video lines to be shorter or longer than others. The TBC acts as a "rubber-band" storage device to line up each horizontal line at its proper location allowing for synchronous playback. **b)** A device used to rectify any problems with a video signal's sync pulses by generating a new clean time base and synchronizing any other incoming video to this reference. The Digital Video Mixer includes two infinite window, full field TBCs.

Time Base Error – A variation in the synchronizing signals. When time base errors are large enough, they may cause skewing or flagging distortion of the video picture.

Time Code – a) A digital code number recorded onto a videotape for editing purposes. When decoded, the time code identifies every frame of a videotape using digits reading hours:minutes:seconds and frames. Each individual video frame is assigned a unique address, a must for accurate editing. The three time code systems used for video are VITC, LTC and RC (consumer). **b)** Electronically generated digital clock information which is recorded onto tapes on a special track such that an editor can accurately locate individual frames (fields) of video information for editing purposes. The SMPTE standard for encoding time in hours, minutes, seconds and frames and video.

Time Code Generator – Signal generator designed to generate and transmit SMPTE time code.

Time Compressed Video-On-Demand – The ideas of electronic video rental could be realized through the techniques of time compression: video data compression is utilized for "less than real time" delivery of video/audio as opposed to real-time, compressed video in "normal" distribution applications.

Time Compression – A technique used in many ATV schemes (including all of the MACs) for squeezing a signal of a certain duration into a time period of lesser duration. This effectively multiplies the bandwidth of the original signal by the compression factor. If the higher bandwidth is not available, horizontal resolution is lost. Time compression is most frequently used for color components (which can often afford the resolution loss due to restricted visual acuity) and for widescreen panels (with the resolution loss made up via some sub-channel).

Time Division Frequency (TDF) – The management of multiple signals by transmitting or receiving each on its own assigned frequency.

Time Division Multiplex (TDM) – The management of multiple signals on one channel by alternately sending portions of each signal and assigning each por-tion to particular blocks of time.

Time Domain – a) Information that is a direction function of time. An oscilloscope displays information in the time domain. b) Mathematical waveforms are described as functions in time, f(t), and are non-linear.

Time Lapse VCR (TL VCR) – A video recorder, most often in VHS format, that can prolong the video recording on a single tape up to 960 hours (this refers to a 180-minute tape). This type of VCR is often used in CCTV systems. The principle of operation is very simple – instead of having the video tape travel at a constant speed of 2.275 cm/s (which is the case with the domestic models of VHS VCRs), it moves with discrete steps that can be controlled. Time lapse VCRs have a number of other special functions very useful in CCTV, such as external alarm trigger, time and date superimposed on the video signal, alarm search and so on.

Time Lapse Video Recording – The intermittent recording of video signals at intervals to extend the recording time of the recording medium. It is usually measured in reference to a 3-hour (180-minute) tape.

Time Line – This is the graphical interface used by most nonlinear editing software. You simply drag and drop your clips onto the time line then your transitions, effects, filters and titles.

Time Multiplex – a) In the case of CCIR-601, a technique for transmitting three signals at the same time on a group of parallel wires (parallel cable). **b)** The technique of recording several cameras onto one time lapse VCR by sequentially sending camera pictures with a timed interval delay to match the time lapse mode selected on the recorder. See also Multiplex.

Time Offset Table (TOT) – Optional DVB SI table that supplies the UTC time and data and shows the difference between UTC time and the local time for various geographical regions. The PID for this table is 0 x 0014,

Time Stamp – a) A term that indicates the time of a specific action such as the arrival of a byte or the presentation of a presentation unit. **b)** A sampled value of a counter at an instant of time. It is used as a timing signal that may be contained in a synchronous data stream. **c)** An indication of a particular time instant relative to a time base.

Timeline (Menu) – The time function that performs (runs) the keyframes of an effect in sequence and enables the timing of the effect to be modified.

Timing – The process of selecting the printing values for color and density of successive scenes in a complete film to produce the desired visual effects.

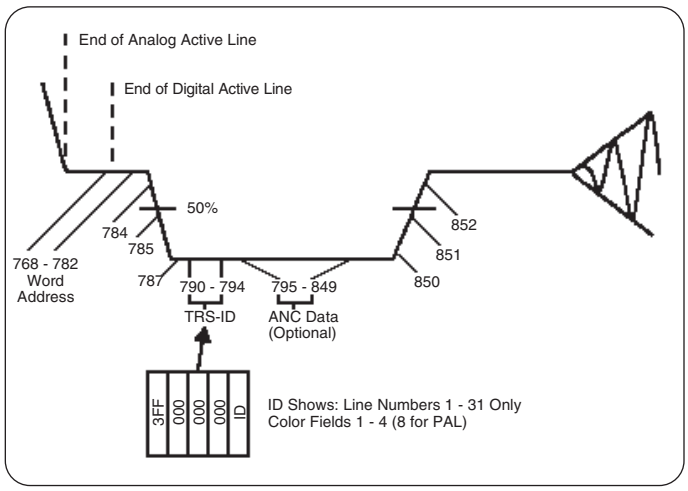
Timing Jitter – The variation in time of the significant instances (such as zero crossings) of a digital signal relative to a jitter-free clock above some low frequency (typically 10 Hz). It is preferable to use the original reference clock, but it is not usually available so a heavily averaged oscillator is used in the measurement.

Timing Model – A model that specifies the semantic meaning of timing information, how it is incorporated (explicitly or implicitly) in the coded representation of information, and how it can be recovered at the terminal.

Timing Reference Mark – This is the 50% point on the leading edge of the horizontal sync pulse. In an RGB system, the green signal's horizontal sync pulse is used. In color difference formats, the Y signal's horizontal sync pulse is used.

Timing Reference Signal Identification (TRS-ID) – A four word reference used to maintain timing in serial composite digital systems.

Timing Reference Signals (TRS) – A four word reference signal used in serial composite digital systems to synchronize the conversion of serial data back to parallel.



Tint – a) Another name for hue. **b)** An effect that replaces the chrominance information of an image with a single colour, but keeps the luminance levels of the image intact. The result is an image formed with shades of only one colour. This is useful for simulating "old-time" sepia images.

Title – A caption or super is a graphic usually text from a character generator i.e., chyron, 3M or from a title camera (black/white high resolution camera).

Title Bar – Located at the top of the application window, it contains the name of the application and sometimes the name of the open file.

Title Generator – A black-and-white camera used for shooting titles that are electronically superimposed onto the video picture during shooting or editing. A more sophisticated device known as a character generator (CG) can generate titles directly.

Title Key – A key effect which imposes a caption over a background scene. The source of the title key signal may be a character generator or a graphics camera.

Titler – See Character Generator (CG).

Titling – The addition of text, symbols and graphic elements to a video image. Titles may be added to a video scene during shooting or in post-production. Sophisticated titling devices allow the user to prepare text and graphics in various sizes, fonts and colors to be triggered later, one-by-one, at appropriate places within a production. Many video cameras include basic titlers or permit externally-generated titles to be mixed with the video image during shooting. The Video TitleMaker 2000 is a powerful tool for titling.

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.

TMC – See TransMux Channel.

TMC (Time Multiplex Component) – An old CBS ATV proposal for delivery via two NTSC-capable DBS channels. One channel would carry a MAC signal of NTSC characteristics; the other would carry additional vertical resolution and widescreen panels. This was the first system to prove that widescreen seams could be rendered invisible.

TMCC (Transmission and Multiplexing Configuration Control)

TML – See TransMux Layer.

TMS – See TransMux Stream.

TNT (Transponder Name Table)

To Source – Video source that is supplying the video and/or audio that is being cut, dissolved or wipe to.

Toe – On the characteristic curve for a photographic material (the plot of density vs. log exposure), that portion representing nonlinear response at the lower densities. For electronic image relationship to photographic negatives or positives.

Toggle – Switch back and forth from one state or value to another (i.e., on, off, on, off, etc.) by alternately opening and closing an electric circuit.

Tolerance – The allowable deviation from the stated nominal width or length.

Toll Quality – Telephone voice quality.

Tool – A graphic entity on the screen which is not an object.

Tools – A tool is a technique that is accessible via the MPEG-4 system description language (MSDL) or described using the MSDL. Tools may, themselves, consist of combinations of tools. Examples are motion compensator, sub-band filter, audiovisual synchronizer, compositor.

Top Field – One of two fields that comprise a frame of interlaced video. Each line of a top field is spatially located immediately above the corresponding line of the bottom field.

Top Layer – The topmost layer (with the highest layer_id) of a scalable hierarchy.

Toshiba – One of the first television set manufacturers to demonstrate an IDTV set. Also a proponent of a widescreen ATV system utilizing high-frequency subcarriers to carry the side panels in a receiver-compatible, channel-compatible signal.

TOT – See Time Offset Table.

Total Thickness – Normally, the sum of the thicknesses of the base film and the magnetic coating. The total thickness governs the length of tape that can be wound on a given reel.

Touchscreen – Term used for a special type of machine controller which has a matrix of photo voltaic transmitters and receivers across the face of a monitor such that by placing a finger on the desired point of the screen intersects this light matrix and automatically activates the corresponding switch.

TOV (Threshold of Visibility) – A bit-error-rate HDTV threshold of 3 x 10-6, at which value the impairment effect first becomes visible in the picture.

TPH (Transport Packet Header)

TPS (Transmission Parameter Signaling)

T-Pulse to Bar – A term relating to frequency response of video equipment. A video signal containing equal amplitude T-pulse and bar portions is passed through the equipment and the relative amplitudes of the T-pulse and bar are measured at the output. A loss of response is indicated when one portion of the signal is lower in amplitude than the other.

Tracer – See Current Tracer.

Track – a) An area of tape surface that coincides with the location of the recorded magnetization produced by one record gap. **b)** A distinct element of audiovisual information, such as the picture, a sound track for a specific language, or the like. DVD-Video allows one track of video (with multiple angles), up to 8 tracks of audio, and up to 32 tracks of subpicture. **c)** One revolution of the continuous spiral channel of information recorded on a disc.

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

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

Track Spacing – The distance between the center lines of adjacent tracks.

Track Width – The width of the track corresponding to a given record gap.

Tracking – The angle and speed at which the tape passes the video heads. Due to small differences in head-to-tape alignment between VCRs, it is sometimes necessary to adjust the tracking control on a VCR when playing a tape recorded on another deck.

Tracking Shot – A shot containing camera movement.

Trailing Edge – The place on the record head where the recording actually takes place.

Training Signal – A Philips-proposed signal to be used in a two-channel ATV transmission scheme that would alert the receiver to flaws that may have been introduced in the transmission of the second channel so that it can compensate for them.

Trajectory – A curve using a set of control points to interpolate in-between points.

TRANS – See Transition.

Transcoder – Device that converts one component format to another, e.g., to convert (Y, R-Y, B-Y) signals to (RGB) signals.

Transcoding – a) Converting a data stream from one format to another, such as MPEG-1 to H.263, or an H.320 video conferencing session to H.323. **b)** A language interpreter or digital signal processor that enables dissimilar terminals to communicate seamlessly.

Transducer – A device which converts energy from one medium to another.

Transfer Function – A complex function of frequency response (and correlated levels) relating the output to the input of the device as a function of frequency. A mathematical, graphical, tabular statement of the influence which a module has on a signal or action compared at input and at output terminals.

Transfer Function, Electro-Optic – a) Display – The relationship between the video signal supplied to a display device and the luminance of the resulting image produced by that display device. **b)** Recorder, Film – The relationship between the video signal supplied to the recorder and the resultant illuminance exposing the film.

Transfer Function, Monitor Electro-Optic – The relationship between video input to the monitor and the luminance of the CRT. Monitors are required to conform to a narrower range of performance specifications than is expected of commercial receivers. Confirming these tighter tolerances requires attention to measurement details since, for example, the luminance may vary if different areas of the tube face are selected. Light output is routinely measured in the center of large, uniform “patches” or windows. Since there is significant “bleeding” of light within a CRT face, the monitor transfer function also decreases with decreasing size of the windows (it is thus reduced for fine detail) and with increasing video level of the raster surrounding the windows.

Transfer Function, Opto-Electronic – The relationship between scene luminances and the corresponding video signal. There may be several opto-electronic transfer functions for a single system, depending upon where in the progression of possible nonlinear processing, bandlimiting, etc., the video signal is being identified. When referred to the camera output before bandlimiting and processing, however, it is essentially a linear function.

Transfer Manager – A tool that you access through the System Toolchest that you use to copy files to and from local and remote tapes or disks.

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

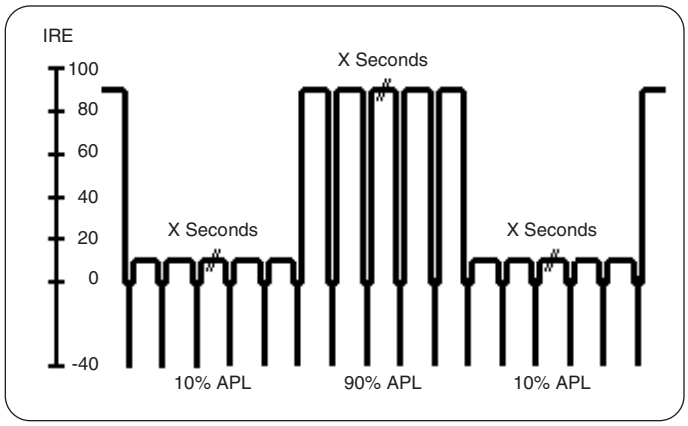
Transform – The process or result of replacing a set of values with another set of values. A mapping of one information space onto another.

Transform Coding – a) A method of encoding a picture by dividing each picture into sub-pictures, performing a linear transformation on each sub-picture and then quantizing and coding the resulting coefficients. **b)** The conversion of a signal from one domain to another, e.g., the conversion of two-dimensional picture samples into the frequency domain by means of DCT, which is used in MPEG.

Transform, Systems – Electronic production requires that images originating in a multiplicity of systems and formats be made compatible in post-production for image processing. The necessary transforms may include temporal, spatial, resolution, colorimetry, etc.

Transformation – Refers to geometric motion or change to an object's orientation (i.e., translate, rotate, scale).

Transient Gain Distortions – Transient gain distortion, also referred to as transient nonlinearity, is present when abrupt changes in APL temporarily affect signal amplitudes. The error is defined as the maximum transient departure in amplitude of sync pulse from the amplitude it had before the change to the amplitude after the change. Measurement of transient gain distortions is done as an out of service test and should be checked for transitions of low to high APL and high to low APL. If the transient gain distortion only affects the sync pulse and then not so severely as to cause the sync to be unusable, then the viewable picture would not be affected. However if the sync pulse is affected then the rest of the picture is also normally affected and when transient gain distortions affect the picture, it appears as abnormal transient brightness effects. A test signal generator capable of producing a "bouncing" flat field signal is used to test for transient gain distortions. A typical signal is shown below. The time between bounces (APL level changes) must be longer then the transient effects so that all the transient effects can be viewed before the next APL change occurs.



Transient Nonlinearity – See the discussion on transient gain distortion.

Transients – Signals which endure for a brief time. These may include overshoots, damped sinusoidal waves, etc., and, therefore, additional qualifying information is necessary.

Transition – a) A change from one picture to another. Any mix, wipe, cut, non-additive mix, or introduction of a key. **b)** The moving of a fader arm or initiating an "auto transition" to accomplish any of the above effects.

Transition Effect – An effect (e.g., barn doors, wipe) where the elements of one clip blend with another during transition.

Transition Mode – Exclusively on the AVC series, an operator may choose automatic transitions that are not linear, that is that they do not have the same rate as they progress. One may choose logarithmic, starting rapidly and finishing slowly; exponential, starting slowly and finishing rapidly; or sinusoidal, starting and finishing slowly but fast in the middle.

Transition Rate – The duration of an automatic transition from one bus to the other is defined as the transition rate. The transition rate may be applied to a mix, wipe or E key, and is operator selectable from 0 to 9.9 seconds.

Translate – To move an object without rotation, in a straight line, either left or right, up or down, in or out, or any combination thereof, in three-dimensional space.

Translating – The process for converting one color difference signal format to another. See the discussion on Matrix.

Translational Extrusion – In translational extrusion, the silhouette follows a linear path.

Translator – a) Broadcast station that rebroadcasts signals of other stations without originating its own programming. **b)** A device used to convert one component set to another, e.g., to convert Y, R-Y, B-Y signals to RGB signals.

Transmission – a) The electrical transfer of a signal, message, or other form of intelligence from one location to another. **b)** The transfer of a video waveform from point to point by conductive cable or fiber.

Transmission Aperture – A number used to compare the amounts of light passed through optical systems, such as camera lenses. Transmission aperture takes into consideration both the F-stop (geometric aperture) and the amount of light absorbed or reflected in the optical system.

Transmission Standard – A standard to be used for transmitting signals to the home, not necessarily for producing them. The scanning structure of NTSC is identical for both production and transmission, but this need not be the case in ATV schemes. For example, an HDEP standard of 1125 scanning lines might be used with a transmission standard of 1050 lines. Standards converters translate one standard into another.

TransMux – A generic abstraction for delivery mechanisms (computer networks, etc.) able to store or transmit a number of multiplexed elementary streams or FlexMux streams. This specification does not specify a TransMux Layer.

TransMux Channel (TMC) – A logical channel that carries data from one FlexMux stream packetized in a sequence of PL-PDUs.

TransMux Entity – An instance of the MPEG-4 systems resource that processes TransMux-PDUs associated to one TransMux stream. This is what may be loosely called the TransMux (de)multiplexer.

TransMux Layer (TML) – A logical MPEG-4 Systems Layer between the FlexMux Layer and the lower network layers used to interleave one or more FlexMux streams, packetized in PL-PDUs, into one TransMux stream. The TransMux layer may be specified outside MPEG-4, e.g., ATM, H.223, TCP, UDP, MPEG-2 TS, etc.

TransMux Protocol Data Unit (TransMux-PDU) – The smallest protocol unit of a TransMux stream exchanged between peer TransMux entities. It consists of TransMux-PDU header and TransMux-PDU payload. It carries data from one or more TransMux channel.

TransMux Protocol Data Unit Header (TransMux-PDU Header) – Information preceding the TransMux-PDU payload. It usually specifies the TransMux channel(s) to which the payload of this TransMux-PDU belongs. It may carry further information, depending on the selected TransMux Layer.

TransMux Protocol Data Unit Payload (TransMux-PDU Payload) – The data field of a TransMux-PDU.

TransMux Stream (TMS) – A sequence of TransMux-PDUs originating from one or more TransMux channels flowing through one network connection.

TransMux User – An MPEG-4 systems entity that makes use of the services of the TransMux Layer, typically a Protection Layer entity.

Transparency – a) Defines the amount of incident light that passes through a surface. Both ambient and diffuse light falling on a transparent polygon are transmitted through the polygon, but highlights are not. In paint systems, a similar property called "opacity" determines how opaque the paint loaded on the artist's brush really is. **b)** Full-color mode makes it possible for a polygon to be translucent by assigning a transparency between 0% and 100% (0 = opaque, 100 = fully transparent). To implement transparency, we assume that a semi-transparent polygon covers only a fraction of each pixel which it covers. The final pixel's value is a blend of the background and the polygon. Again, color maps have too few colors to do this. **c)** A feature in Indeo Video interactive codec in which software emulates chroma keying, allowing foreground video objects to be composited dynamically over a different background, a bitmap or possibly even another video. See Chroma Key.

Transparency Frame – In the transparency technique first-frame analysis, the first frame of the video file. It contains no video data, but merely supplies the color or range of colors to be rendered as transparent. See First-Frame Analysis, Transparency.

Transponder – Satellite transmitter/receiver that picks up signals transmitted from earth, translates them into new frequencies and amplifies them before retransmitting them back to ground.

Transport – Term used for any machine using motors usually meaning a VTR, DTR or video disk.

Transport Stream – A multiplex of one or more programs that are carried in packets. Demultiplexing is achieved by different packet IDs (PIDs). See PSI, PAT, PMT, and PCR.

Transport Stream Packet Header – The leading fields in a transport stream packet up to and including the continuity_counter field.

transport_stream_id – A unique identifier of a TS within an original network.

Transportation – The delivery in physical form of a program prepared for distribution. The completed program may be in the form of a tape recording, a film print, an optical disc, etc.

Transverse – Across the width of the tape.

Trapezoidal Error – A change in the angle of a recorded helical scan track. Can result in mistracking.

Traveling Matte – A process shot in which foreground action is superimposed on a separately photographed background by optical printing.

Trellis Coding – Trellis coding is a source coding technique that has resulted in numerous publications and some very effective source codes. Unfortunately, the computational burden of these codes is tremendous and grows exponentially with the encoding rate. A trellis is a transition diagram, that takes time into account, for a finite state machine. Populating a trellis means specifying output symbols for each branch, specifying an initial state yields a set of allowable output sequences. A trellis coder is defined as follows: given a trellis populated with symbols from an output alphabet and an input sequence x of length n, a trellis coder outputs the sequence of bits corresponding to the output sequence x that maximizes the SNR of the encoding.

Trellis Diagram – The time sequence of the bits (DVB-S) is predefined by convolutional coding and, like the state diagram of a finite automaton, is represented as a trellis diagram.

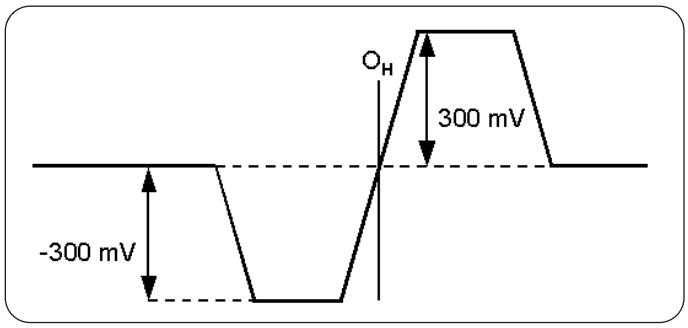
Triad – Three colored phosphor dots on the faceplate of a tri-color CRT. Some tri-color CRTs use vertical stripes of different color phosphors or vertically oriented oblong dots. These dots or stripes are the ultimate determinants of maximum horizontal resolution. When the dots are round, they are also the maximum determinants of vertical resolution. The finer the dot pitch, the higher the resolution, since it is not possible to reduce the size of a black-and-white pixel below the size of one triad. Triad spacing also cannot be optimized for all numbers of scanning lines. Thus, a tube optimized for 1125 scanning lines will not yield optimum performance with a signal of 1050 scanning lines, or vice versa. Neither black-and-white CRTs nor the three single-color CRTs used in most projection TV sets suffer from these limitations as their faceplates are uniformly covered with a layer of phosphor and resolution is ultimately determined by the size of the electron beam and the projection optics. Picture tubes with striped apertures can deal effectively with multiple scanning rates, but still restrict horizontal resolution to the width of three stripes.

Trichromatic – The technical name for RGB representation of color to create all the colors in the spectrum.

Trick Modes – A generic analog term that has carried over to digital media functions such as fast forward, rewind, stop, pause.

Trigger – Slang term for the button on the video camera or camcorder that when depressed, sends a signal to the videotape recorder to begin or stop recording.

Tri-level Sync – This synchronization signal is sued within high definition analog formats and is a three-level pulse which goes from 0 to -300 mV and then rises to +300 mV before returning to 0 mV. The reference point OH is defined as the 50% point of the positive rising edge of the signal and is at the 0 mV level. This simplifies sync separator design and increases sync stability.



Trim – a) To add or subtract from and EDK time or switcher sequence duration. **b)** To perform some minor adjustment or X, y or Z axis on ADO or switcher effects. See Crop.

Trim Curves – Curves that define holes on or parts cut away from a surface; they are linked to the surface.

Trimming – Editing a clip on a frame-by-frame basis, or editing clips in relationship to one another.

Tripod – A three-legged video camera or camcorder mounting device that provides steady, tireless service.

Tripod Dolly – A combination tripod and dolly.

Tri-Scan – Term for the technique of sub-sampling each NTSC pixel into three sub-pixels used in the HD-NTSC ATV scheme.

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

Tristimulus Values – a) Amounts of the three reference color stimuli, in a given trichromatic system, required to match the color of the stimulus considered. Note: In the CIE standard colorimetric systems, the tristimulus values are represented by the symbols X, Y, Z and X~, Yn, Zn. **b)** The amounts of the three reference or matching stimuli required to give a match with the light considered in a given trichromatic system.

Troubleshoot – To seek the cause of a malfunction or erroneous program behavior in order to remove the malfunction.

Troubleshooting Tree – Flow diagram consisting of tests and measurements used to diagnose and locate faults in a product.

TRS – See Timing Reference Signals.

TRS-ID – See Timing Reference Signal Identification.

TRT (Total Running Time) – Usually expressed in hr:min:sec:frames or min:sec:frames.

Truck – Term used for a type of camera movement where the camera actually moves left to right (vice versa) across a scene.

True Color – An image in which each pixel is individually represented using three color components, such as RGB or Y'CbCr. The color components of each pixel may be independently modified.

True NTSC – A concept of an idealized NTSC that is identical throughout the NTSC world. Unfortunately, the NTSC standards are loose enough to allow various sub-channel schemes, though these schemes may be mutually incompatible. It is possible that some years from now an NTSC television set designed for one form of enhanced NTSC may be receiver-incompatible with transmission of another form of enhanced NTSC.

Truespeech – Truespeech is a codec used for low bandwidth encoding of speech (not music). It was created by the DSP Group. It is available on Microsoft Windows 98 among other systems.

Truncation – a) Deletion of lower significant bits on a digital system. Usually results in digital noise. **b)** Shortening the word length of a sample or coefficient by removing low-order bits. **c)** To terminate a computational process in accordance with some rule. For example, when digital mixing or other operations create extra bits per sample (such as 16 bits from multiplication of two 8-bit samples), it is usually necessary at some point to truncate (or round) the result back to the original bit length, and to apply some rule to the correction of the part retained. Various rules have been introduced for how this may be done with digital video images for the least noticeable result.

TS – See Transport Stream.

TS Header – The first four bytes of each TS packet contain the data (PID) required for the demultiplexer in addition to the sync byte (0 x 47). These bytes are not encoded.

TSB (Telecommunication Standardization Bureau) – The executive arm of the Telecommunication Standardization Sector, and is headed by an elected Director. The Director of TSB is responsible for annually updating the work programme of the Sector approved by world telecommunication standardization assemblies, in consultation with the chairpersons of the ITU-T study groups and the Telecommunication Standardization Advisory Group.

TSDT (Transport Stream Description Table) – A PSI table defined in MPEG-2 systems. The TSDT is composed of a section header followed by a descriptor loop (and in constrained to carry only descriptors as a payload in the descriptor loop). As stated in MPEG-2 systems, the descriptors carried in this table are scoped to the entire transport stream.

TSMF (Transport Stream Multiplexing Frame)

T-STD (Transport Stream System Target Decoder) – A decoder having a certain amount of buffer memory assumed to be present by an encoder.

TTL (Thru-the-Lens) – Viewing or color measuring.

TTL (Transistor-Transistor Logic) – Family of digital integrated circuits that have bipolar transistor inputs and outputs. b) Term used in digital electronics mainly to describe the ability of a device or circuit to be connected directly to the input or output of digital equipment. Such compatibility eliminates the need for interfacing circuitry. TTL signals are usually limited to two states, low and high, and are thus much more limited than analog signals.

TTS (Text-to-Speech) – Describes a software program that prompts a computer-generated voice to recite the words in a computer file.

TTY (Teletypewriter) – A telecommunication device that enables conversation in printed form over the telephone.

Tuner – An element of a television set that allows the user to select specific signals and frequencies (channels) to be shown on the picture tube and played through the speaker.

TV Lines – Measure of resolution. A TV line is either black or white, so two TV lines (one black and one white) form one cycle of spatial resolution. TV lines are often confused with scanning lines. For vertical resolution, scanning lines multiplied by the Kell factor (and, when appropriate, by the interlace coefficient) yield TV lines.

TVCT – See Terrestrial Virtual Channel Table.

TWAIN – A scan control program that pops up within an application to allow for the adjustment of brightness, contrast, etc.

Tweening – The feature that fills in the frames between two images so the movement appears smoother. See also Keyframing.

TWG (Technical Working Group) – A general term for an industry working group.

Twinkle – A sparkling effect that can be caused by sub-sampling, since the finest detail is transmitted at a rate below the flicker frequency (and sometimes even below the fusion frequency).

Twisted-Pair – A cable composed of two small insulated conductors twisted together. Since both wires have nearly equal exposure to any interference, the differential noise is slight.

Twitter – A flickering of fine horizontal edges caused by interlaced scanning. A fine line appearing in only one field is presented below the flicker frequency; therefore, it flickers. Twitter is eliminated in line doubling schemes that change from interlaced to progressive scanning, as most of the IDTV schemes do. Interestingly, twitter was much less of a problem in the early days of NTSC, than it is today, because early cameras and displays didn't have sufficient detail to confine an edge to one scanning line.

Two Wire Interconnect – Interconnect consisting of two wires. One wire transports the luminance signal while the other transports the multiplexed chrominance signals. This system allows efficient dubbing between recorders because recorders normally record the luminance on one tape channel and the two color difference signal on a single channel. To record the two color difference signals on a single channel, the two color difference signals are compressed and then multiplexed together. Transferring the two video signals between tape recorders in the two wire format prevents the two tape recorders from having to do additional signal processing.

Two's Complement Numbers – a) Numbering system commonly used to represent both positive and negative numbers. The positive numbers in two's complement representation are identical to the positive numbers in standard binary. However, the Two's complement representation of a negative number is the complement of the absolute binary value plus 1. Note that the eighth or most significant bit indicates the sign: 0 = plus, 1 = minus. **b)** The number calculated so that each bit of a binary number is inverted (ones are replaced with zeros and vice versa), then one (=000...0001b) is added ignoring the overflow.

Two-Track Recording – On 1/4" wide tape, the arrangement by which only two channels of sound may be recorded, either as a stereo pair in one direction or as separate monophonic tracks (usually in opposite directions).

Type C – SMPTE standard for 1-inch non-segmented helical video recording format.

▶ U

U – The B-Y signal after a weighting factor of 0.493 has been applied. The weighting is necessary to reduce peak modulation in the composite signal.

UART (Universal Asynchronous Receiver Transmitter) – a) A serial to parallel and parallel to serial converter. **b)** A serial interface which serializes parallel data and inserts start, stop, and parity bits. It may also change a serial data stream into parallel bits or bytes and separate start, stop, and parity bits.

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

UDF Bridge – a) A "bridge" ties several specifications together, In DVD, bridges are drawn to UDF, MPEG-2 and Dolby C-3. **b)** A combination of UDF and ISO 9660 file system formats that provides backward-compatibility with ISO 9660 readers while allowing full use of the UDF standard.

UDP (User Datagram Protocol) – A transport protocol in the Internet suite of protocols. UDP, like TCP, uses IP for delivery; however, unlike TCP, UDP provides for exchange of datagrams without acknowledgements or guaranteed delivery.

UDTV (Ultra Definition TV) – UDTV with a 2,000-line (or more) display is being contemplated in Japan. The ideas underline the importance of scalability in future broadcast technology, and suggest that rigid standards will only have a limited life span. The MPEG-2 syntax would support the level of resolution found in UDTV, but actual tests of conformance at this resolution are not planned so far. In addition, a question of interoperability with other digital TV services will also have to be investigated.

UHF – See Ultra High Frequency.

UI (Unit Interval) – In information technology, the user interface (UI) is everything designed into an information device with which a human being may interact – including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it. In early computers, there was very little user interface except for a few buttons at an operator's console. The user interface was largely in the form of punched card input and report output.

Ultimate Tensile Strength – The force per unit cross-sectional area required to break a tape or length of base film, usually given in pounds per square inch (psi). Ultimate tensile strength is also quoted in terms of pounds per tape sample of given width and base thickness.

Ultimatte – Trade name of a high-quality special effects system similar in application to a chroma key switcher. Electronic implementation of the "blue screen" used for motion picture special effects.

Ultra High Frequency (UHF) – The frequency band (300 MHz-3,000 MHz). In television, UHF refers to a subset of that band, the range from 470 MHz to 890 MHz, once allocated to TV channels 14 through 83. Demands of other transmission services (such as police radios) have eaten into both the lower and the upper reaches of the UHF TV allocations. Taboos eliminate still more channels. Nevertheless, the UHF TV band is seen by many ATV proponents as the most likely place to situate receiver-incompatible and augmentation ATV channels.

Ultra SCSI (Ultra Wide SCSI) – Currently, the newest and best kind of drives for DV. New technology makes these drives better than AV optimized.

U-Matic – Trade name for 3/4-inch video cassette system originally developed by Sony. Now established as the ANSI (American National Standards Institute) Type F videotape format.

UMID (Unique Material Identifier) – A SMPTE standard (SMPTE 300M/RP205) for metadata. The basic UMID contains 32 bytes of unique identification information (12 bytes identifying it as UMID data, followed by length and identification values). The extended UMID has an additional 32 bytes of information that contain "signature information" (time and data of creation, longitude, latitude, and altitude, as well as country, organization, and user codes).

UMTS (Universal Mobile Telecommunication System) – A 3G mobile wireless telecommunications system whose standards are being developed by the Third Generation Partnership Project (3GPP).

Unbalanced Audio Signal – Unbalanced systems use a signal and signal ground components. Shield conductors are sometimes employed as well. Interconnection of unbalanced signals is simple using relatively inexpensive cables and connectors such as the RCA phono jack.

Unbalanced Line – A line using two conductors to carry a signal, where one of the conductors is connected to ground.

Unbalanced Signal – In CCTV, this refers to a type of video signal transmission through a coaxial cable. It is called unbalanced because the signal travels through the center core only, while the cable shield is used for equating the two voltage potentials between the coaxial cable ends.

Uncompressed Video – A recorded or digitized video stream that is not processed by a data compression scheme. The video signal remains uncompressed at all stages of the process: input, storage, and output. Uncompressed video conforms to the ITU-R 601 standard.

Uncompressed-Quality Video – Video that has the same image quality as uncompressed video, but has been compressed using mathematically lossless compression to optimize storage space.

Underscan – Most televisions use overscanning, resulting in some of the video being lost beyond the edges of the screen. Underscanning modifies the video timing so that the entire video signal appears in a rectangle centered on the television screen with a black border. The resolutions for square-pixel underscan and overscan images are:

NTSC overscan: 640 x 480	PAL overscan: 768 x 576
NTSC underscan: 512 x 384	PAL underscan: 640 x 480

Undo/Redo – The process that allows a return to the state of the edit immediately preceding the last edit or a repeat of an "undo" edit.

UNI (Ente Nazionale Italiano di Unificazione) – Italian standardization body.

UNI (User-to-Network Interface) – The interface between user equipment and private or public network equipment (e.g. ATM switches).

Unicast – Sending each user their own copy of a video (or other data) stream. As opposed to multicast, where one copy is sent and whoever wants it listens to that copy. It is the most commonly used method for video conferencing and video on demand today. Multicast, which is much more efficient, is slowly gaining ground, but required Internet Service Providers to support it.

Unidirectional – a) A pickup pattern which is more sensitive to sounds arriving from one direction than from any other. **b)** Wire or group of wires in which data flows in only one direction. Each device connected to a unidirectional bus is either a transmitter, or a receiver, but not both.

Unidirectional Mike – A microphone which picks up signals primarily from one direction and discriminates against or rejects sounds arriving from other directions.

Unidirectional Prediction – A form of compression in which the codec uses information only from frames that have already been decompressed. Compare Bidirectional Prediction.

Uniform B-Spline – A curve that rarely passes through its control point. Usually very smooth and may be controlled locally without generating breakpoints (cusps).

Uniformity – The extent to which the output remains free from variations in amplitude. Uniformity is usually specified in terms of the positive and negative deviations from the average output within a roll, and in terms of the deviations in the average outputs between one roll and another. Uniformity is normally quoted in percent or dB.

Uni-Key – A dedicated ISO keyer on the Vista switcher for use of a digital effects unit or character generator.

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 Label (UL) – A mechanism defined in SMPTE 298M used to identify the type and encoding of data within a general purpose data stream or file.

Universal Label Code – A code in the Universal Label created by concatenating the first two sub-identifiers for ISO and ORG. For the SMPTE UL, this field must be "2B" in hexadecimal (hex) notation (0 x 2B).

Universal Label Data Key – The 16-byte Universal Label that identifies the data being represented. Equivalent to "descriptor" in the terminology of MPEG-7 requirements.

Universal Label Header – The first three octets of a Universal Label containing information unique to the label.

Universal Resource Locator (URL) – A unique identification of the location of an elementary stream or an object descriptor.

Unmodulated – When used to describe television test signals, this term refers to pulses and pedestals which do not have high-frequency chrominance information added to them.

Unmount – To make a file system that is accessible from a specific directory on a workstation temporarily inaccessible.

UNO-CDR (Universal Networked Object-Common Data Representative)

UNO-RPC (Universal Networked Object-Remote Procedure Call)

Unsqueezed Print – A print in which the distorted image of an anamorphic negative has not been corrected for normal projection.

Up Cut – In editing, to cut the end of the previous scene, often by mistake. In general, to cut short.

Up-Down Buttons – The replacement for potentiometers on AVC switchers. These allow three speeds of adjustment and may be assigned to any module. They offer a more compact package, and eliminate the problem of recalling an event that has different settings than the physical pots may have.

Upgrade – Hardware that you add to the basic hardware that increases performance, such as additional memory (SIMMs) or faster graphics boards.

Uplink – The carrier used by Earth stations to transmit information to a satellite.

UPS (Uninterruptible Power Supply) – These are power supplies used in the majority of high security systems, whose purpose is to back-up the system for at least 10 minutes without mains power. The duration of this depends on the size of the UPS, usually expressed in VA, and the current consumption of the system itself.

Upscaling – The process of creating extra data from an incoming video stream to increase the image size by interpolating or replicating data before placing it into memory.

Upstream – A term describing the precedence of an effect or key. The "stream" of video through a switcher allows multiple layers of effects to be accomplished, with each successive layer appearing on top of the previous one. A module or effect whose video priority is lower, or underneath subsequent modules or effects is said to be upstream.

US (Upstream Channel) – In CATV, a downstream channel is one used to transmit signals from the headend to the user. An upstream channel is one in another frequency band that is used to send signals from the user back to the headend.

U**SB (Universal Serial Bus) –** A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices. It also supports MPEG-1 and MPEG-2 digital video. USB has a maximum bandwidth of 12 Mbits/sec (equivalent to 1.5 Mbytes/sec), and up to 127 devices can be attached. Fast devices can use the full bandwidth, while lower-speed ones can transfer data using a 1.5 Mbits/sec subchannel.

User Bits – Bits in a time code sequence that are user definable; i.e., to give the sequence a name or to add the date, etc.

User Bits – Portions of VITC and LTC reserved for recording information of the user's choosing, e.g. keykode numbers, footage count, etc.

User Data – All data above the channel layer. That includes video, audio, systems packet overhead, sub-pictures, navigation data, DSI packets, and file management data. The DVD reference data rate is specified as 11.08 Mbps.

User Datagram Protocol (UDP) – An unreliable Network Layer. It is on the same level in the network stacks as TCP.

User ID – A number that uniquely identifies a user to the system.

User Interaction – The capability provided to the user, by MPEG-4 representation of Audiovisual Objects to perform a broad class of interactive manipulation on the audiovisual information such as navigation and editing.

UTC (Universal Time, Coordinated) – Greenwich meantime.

Utilities – Auxiliary functions or operations.

UTP (Unshielded Twisted Pair) – A cable medium with one or more pairs of twisted insulated copper conductors bound in a single sheath. Now the most common method of bringing telephone and data to the desktop.

U-Type VTR – A recorder format that uses 3/4-inch videotape.

UXGA – An ultra-high display resolution of 1600 x 1200 pixels.

▶ V

V – The R-Y signal after a weighting factor of 0.877 has been applied. The weighting is necessary to reduce peak modulation in the composite signal.

VADIS (Video-Audio Digital Interactive System)

Valid Signal – A video signal that will remain legal when translated to any other format. A valid signal is always legal, but a legal signal is not necessarily valid. Signals that are not valid will be processed without problems in their current format, but problems may be encountered if the signal is translated to a new format.

Value – a) The amount of black mixed into pigment. **b)** The instance of information described by the UL Data Key. **c)** The actual data associated with a particular property in an OMF interchange object.

Vaporware – Software or hardware that is talked about, but may never actually appear.

VAR (Value Added Reseller) – A company which resells hardware and software packages to developers and/or end-users.

Variable Bit Rate (VBR) – Operation where the bit rate changes with time during the decoding of a compressed bit stream. Although variable bit rate is acceptable for plain linear playback, one important consideration for not using VBR is that quick random access becomes nearly impossible. There is no table of contents or index in MPEG. The only tool the playback system has for approximating the correct byte position is the requested playback time stamp and the bit rate of the MPEG stream. MPEG streams do not encode their playback time. To approximate an intermediate position in a variable bit rate stream, the playback system must search data near the end of the stream to calculate the playback time, and assume the stream has an approximately constant bit rate. The search for the correct position can take several seconds. This searching is at least annoying when trying to view a portion of a movie but it is not even possible for video streams because there are no time stamps (the SMPTE time codes in video streams need not to be continuous or unique). Audio streams are always fixed bit rate.

Variable Length Coding – A reversible procedure for coding that assigns shorter code-words to frequent events and longer code-words to less frequent events.

Variable-Speed Play – A process, or an editing-system feature that enables the process, of shifting easily between the playing, stepping (jogging) and shuttling of footage.

VAU (Video Access Unit) – One compressed picture in program stream.

VBI – See Vertical Blanking Interval.

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 Video System Control Architecture (VISCA) commands into LANC protocol.

VBR – See Variable Bit Rate.

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

VBV – See Video Buffering Verifier.

VCI (Virtual Channel Identifier) – 16-bit field in the header of an ATM cell. The VCI, together with the VPI, is used to identify the next destination of a cell as it passes through a series of ATM switches on its way to its destination. ATM switches use the VPI/VCI fields to identify the next network VCL that a cell needs to transit on its way to its final destination. The function of the VCI is similar to that of the DLCI in Frame Relay. Compare with DLCI.

VCN (Virtual Channel Number) – Virtual Channels appear as extra channels above the normal channels on a given satellite. A Virtual Channel would be something such as channel 612 on C3 (Discovery Science Channel) It is actually on transponder 22 but since there are 9 other channels on that transponder, it was easiest for all to just tune a channel number. The mini dishes also work on this principle.

VCP (Video Capable Audio Player) – An audio player which can read the limited subset of video features defined for the DVD-Audio format. Contrast with Universal DVD Player.

VCR (Video Cassette Recorder) – An analog magnetic recording and playback machine. Generally used for recording and viewing full-motion video.

VCT (Virtual Channel Table) – The ATSC table that describes a set of one or more channels or services. For each channel, the table indicates major and minor channel number, short channel name, and information for navigation and tuning. There are two types of VCTs, the TVCT for terrestrial systems and the CVCT for cable systems.

VDA – See Video Distribution Amplifier.

VDI (Video Disk Interface) – A software driver interface that improves video quality by increasing playback frame rates and enhancing motion smoothness and picture sharpness.

VDRD (Variable Data Rate Video) – In digital systems, the ability to vary the amount of data processed per frame to match image quality and transmission bandwidth requirements. DVI symmetrical and asymmetrical systems can compress video at variable data rates. Also called Variable Bit Rate (VBR).

Vector – a) A vector is a directed edge. That is, given points a and B, the line that connects A and B becomes a vector if we specify its direction (i.e., which point is the start point). The vector that goes from A to B is not the same vector as the one that goes from B to A. Vectors exist in 3D; they connect points in 3D space. **b)** An entity that possesses the attributes of a norm and a direction. It can be defined in 3D space by two points, one representing the origin and the other, the extremity. **c)** A motion compensation parameter that tells a decoder how to shift part of a previous picture to more closely approximate the current picture.

Vector Graphics – Images defined by sets of straight lines, defined by the locations of the end points.

Vector Image – An image described by basic geometric shapes like rectangles, polygons, circles, ellipses, lines and curves.

Vector Interrupt – See Interrupt Vectoring.

Vector Quantization – a) A compression technique in which groups of picture samples (the vectors) are represented by predetermined codes. Encoding is done by matching the vectors with code words in a code book, and the addresses of the code book are then sent to the decoder. The picture quality depends widely on suitable code books and the match algorithms. **b)** A technique where a vector (usually a square of samples of one color component of an image) are represented by a single number. This number is an index into a code book by which the vector is reconstructed. The major issues are finding (calculating) a robust code book and how to choose the "best" code book entry for a given input vector.

Vectorscope – A specialized oscilloscope which demodulates the video signal and presents a display of R-Y versus B-Y. The angle and magnitude of the displayed vectors are respectively related to hue (R-Y) and saturation (B-Y). The vectorscope allows for the accurate evaluation of the chrominance portion of the signal. Some vectorscopes can select either 75% or 100% color bars. Make sure the correct mode is selected or the chroma gain can be misadjusted.

Velocity of Propagation – Speed of signal transmission. In free space, electromagnetic waves travel at the speed of light. In coaxial cables, this speed is reduced by the dielectric material. Commonly expressed as percentage of the speed in free space.

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.

Vertical Alias – An alias caused by unfiltered sampling in the vertical direction by scanning lines. Vertical aliasing is frequently noticed when reading vertical resolution on a resolution chart. The wedge-like lines become finer and finer until they reach the limit of the vertical resolution of the system, but then they may appear to widen or to change position. This is caused by lines on the chart sometimes falling between scanning lines and sometimes on them. In a properly filtered television system, detail finer than the vertical resolution of the system would be a smooth blur.

Vertical Blanking – a) Refers to the blanking signals which occur at the end of each field. **b)** The time during which the electron beams of an output device are turned off and positioned to the upper left edge of the display. **c)** A video synchronizing signal that defines the border or black area at the top and bottom of the display and, in a CRT, hides (blanks out) the electron beam's retrace path from the bottom to the top of the display.

Vertical Blanking Interval (VBI) – a) That part of the video signal where the voltage level is at 0 IRE and the electron beam sweeps back from the bottom to the top of the screen. **b)** A period during which the electron beam in a display is blanked out while it travels from the bottom of the screen to the top. It is the black bar that becomes visible when the vertical hold on a television set is not correctly adjusted. The VBI is usually measured in scanning lines. When the VBI is subtracted from the total number of scanning lines, the result is the number of active scanning lines. In NTSC, the VBI has a duration of 20.5 or 21 lines (depending on the field), of which nine lines are devoted to the vertical synchronizing signal that lets television sets know when a field has been completed. The remaining lines have long been used to carry auxiliary information, such as test and reference signals, time code, and encoded text, such as captions for the hearing impaired. Some ATV schemes propose expanding the VBI to accommodate widescreen images by the letterbox technique; some propose using it as a sub-channel for additional picture information. See also Blanking.

Vertical Drive – A pulse at field rate used in TV cameras. Its leading edge is coincident with the leading edge of the vertical blanking pulse and its duration may be 10.5 lines.

Vertical Flyback – See Vertical Retrace.

Vertical Interval – a) The synchronizing information which appears between fields. The vertical interval signals the picture monitor to go back to the top of the screen to begin another vertical scan. **b)** The portion of the video signal that occurs between the end of one field and the beginning of the next. During this time, the electron beams in the cameras and monitors are turned off so that they can return from the bottom of the screen to the top to begin another scan.

Vertical Interval Reference (VIR) – A signal used as a reference for amplitude and phase characteristics of a color television program (FCC assigned to line 19).

Vertical Interval Switching – Randomly switching from one video signal to another, will often result in a jump in the picture upon playback. The problem is compounded when the tape is copied. To avoid this problem, switching is best performed on synchronized signals during the vertical blanking retrace period, known also as the vertical interval. This allows complete replacement of one whole frame by a second whole frame resulting in a very smooth on-screen switch.

Vertical Interval Test Signal (VITS) – a) Test signal that is inserted on one line in the vertical interval. These signals are used to perform in-service tests. **b)** Signals transmitted on lines 17 and 18 in both fields for evaluation of system performance. Usually color bars, multi-burst, modulated stairstep and composite are transmitted.

Vertical Interval Time Code (VITC) – a) Time code information stored on specific scan lines during the vertical blanking interval. A popular method for recording time code onto videotape. A time code address for each video frame is inserted in the vertical interval (the vertical blanking retrace period) of the video signal, where it is invisible on-screen yet easily retrieved, even when a helical scanning VCR is in pause mode. The most common form of VITC is SMPTE-VITC. The Thumbs Up editor supports SMPTE-VITC (as well as RC time code). **b)** Time code stored in the vertical interval of the video signal. Has the advantage of being readable by a VTR in still or jog. Multiple lines of VITC can be added to the signal allowing the encoding of more information than can be stored in normal LTC.

Vertical Resolution – The amount of detail that can be perceived in the vertical direction; the maximum number of alternating white and black horizontal lines that can be counted from the top of the picture to the bottom. It is not the same as the number of scanning lines. It is the number of scanning lines minus the VBI times the Kell factor (and, where appropriate, times the interlace coefficient).

Vertical Retrace – The return of the electron beam from the bottom to the top of the raster after completion of each field.

Vertical Scaling – See Scaling.

Vertical Scan Frequency – The frequency of the vertical sync pulses or vertical scans. NTSC vertical scan frequency is 59.9 Hz.

Vertical Scan Rate – For noninterlaced video, this is the same as frame rate. For interlaced video, this is usually considered to be twice the frame rate.

Vertical Serrations – A vertical synchronizing pulse contains a number of small notches called vertical serrations.

Vertical Shift Register – The mechanism in CCD technology whereby charge is read out from the photosensors of an interline transfer or frame interline transfer sensor.

Vertical Size – Vertical size (from the top to the bottom of the screen) can be reduced making objects appear short and squat or increased making objects appear tall and thin. Vertical size which is not unity, is distortion. The control comes from analog video where a control was made available to compensate for unstable sweep circuitry. Vertical size in digital video is controlled by line replication or line interpolation.

Vertical Sync – The pulse that initiates the vertical retrace of the electron gun from the bottom of a frame back to the top.

Vertical Sync Pulse – a) The synchronizing pulse at the end of each field which signals the start of vertical retrace. **b)** The part of the vertical blanking interval comprising the blanking level and six pulses (92% duty cycle at -40 IRE units) at double the repetition rate of the horizontal sync pulse. The vertical sync pulse synchronizes the vertical scan of television receiver to the composite video signal, and starts each frame at same vertical position (sequential fields are offset by half a line to obtain an interlaced scan.)

Vertical-Temporal Pre-Filtering – Filtering at the camera or transmission end to eliminate vertical and temporal aliases. When a high line rate, progressively scanned camera is pre-filtered to NTSC rates, the resulting image is not only alias-free but can also be used by an advanced receiver to provide vertical and temporal resolution beyond that normally found in NTSC. The Kell factor of such a system can be close to one.

Vertical-Temporal Sampling – Sampling that occurs in every television signal due to individual frames (which sample in time) and individual scanning lines (which sample in the vertical direction). This sampling can cause aliases unless properly pre-filtered.

Very High Frequency (VHF) – The range from 30 MHz to 300 MHz, within which are found U.S. television channels 2 through 13. VHF television channels seem about as filled as current technology allows, which is why much ATV debate centers on channel allocations in UHF and/or SHF. Some ATV proponents, however, feel that a robust, low-level digital augmentation channel might be squeezed into adjacent VHF channels without interference, perhaps even two augmentation channels per adjacent channel. If that can be done, every U.S. television broadcaster would be able to have an ATV augmentation channel.

Very Large Scale Integration (VLSI) – Technology by which hundreds of thousands of semiconductor devices are fabricated on a single chip.

VESA Local Bus (VL) – In late 1992, VESA (Video Electronics Standard Association) completed the specification for a local bus expansion for PCs. One of the most important things about VL Bus design is that it specified connector pinout. The VL Bus, considered a high-speed bus with a maximum speed of 66 MHz, was designed with the Intel 486 in mind. The 32-bit bus, which includes unbuffered control, data, and address signals is compatible with 16-bit operations. One drawback of the VL Bus implementation is that the more expansion connectors used, the slower the operation of the bus. For example, using two connectors, the highest recommended speed is 40 MHz. When multiple bus slots are desired, multiple VL Bus subsystems can be built into a single PC.

Vestigial Sideband – a) The vestige of a sideband left after filtering. **b)** A sideband in which some of the spectral components are greatly attenuated.

Vestigial Sideband Transmission – A system of transmission wherein the sideband on one side of the carrier is transmitted only in part.

VGA (Video Graphics Array) – A hardware video display standard originally developed by IBM and widely used. VGA defines many different resolution and color modes. See also SVGA.

Computer Scanning Standards

Resolution Mode	Color Mode	Frames/ sec	Lines/ frame	Lines/ sec	Data Rate (Mb/sec)
640 x 480 VGA	4bpp	60	525	31500	9.2
640 x 480 SVGA	8bpp	60	525	31500	18.4
640 x 480 SVGA	RGB16	60	525	31500	36.8
640 x 480 SVGA	RGB24	70	525	36750	64.5
1024 x 768 SVGA	8bpp	70	800	56000	55.0
1280 x 1024 SVGA	4bpp	70	1100	77000	45.9

VHF – See Very High Frequency.

VHS (Video Home System) – Consumer videocassette record/playback tape format using half-inch wide magnetic tape. The most common home VCR format in the U.S.

VHS Hi-Fi – An improved stereo audio recording/playback system found on some camcorders and VCRs. Because the audio tracks are mixed and recorded with the video signal, audio only dubbing of these tracks is not possible.

VHS-C (VHS-Compact) – A miniature version of the VHS tape format utilizing smaller cassettes that may also be played on standard VHS machines by using an adapter cartridge.

VidCap – Microsoft's Video for Windows® program to capture video input to RAM or hard disk memory.

ViDe (Video Development Group) – Currently consists of the Georgia Institute of Technology, North Carolina State University, The University of North Carolina, Chapel Hill, and the University of Tennessee, Knoxville, in partnership with NYSERNet (New York State Education, Research Network).

Video – a) A term pertaining to the bandwidth and spectrum position of the signal which results from television scanning and which is used to reproduce a picture. **b)** A complex and sophisticated electronic signal which, when properly processed by a television receiver can be used to provide full color pictures. **c)** An electrical signal used to carry visual information. Composite video includes sync and blanking signals. Non-composite video does not include sync.

Video Band – The frequency band utilized to transmit a composite video signal.

Video Bandwidth – The range between the lowest and highest signal frequency of a given video signal. In general, the higher the video bandwidth, the better the quality of the picture. Video bandwidths used in studio work typically vary between 3 and 12 MHz. Consumer VCRs are generally capable of 3-5.5 MHz.

Video Buffering Verifier (VBV) – A hypothetical decoder that is conceptually connected to the output of the encoder. Its purpose is to provide a constraint on the variability of the data rate that an encoder or editing process may produce (ISO13818-2 Annex C). This postulates the existence of a buffer in the receiver and a prediction mechanism in the encoder. This mechanism will predict the buffer fullness due to the constant fill from the constant bit rate (CBR) stream and the variable empty due to the variation in decoder bit demand. This latter factor can be controlled at the encoder by varying the quality of the encoding process (quantization factor, mainly).

Video Camera – A camera which contains an electronic image sensor rather than photographic film. The lens focuses an image on an electronic tube or CCD chip. A camera has electronic circuitry which generates color and sync pulses. Most portable consumer cameras are equipped with a full complement of audio circuitry, e.g., microphone, audio amplifier and additional audio electronics. In order to obtain better quality images, a professional camera has three tubes or a triple CCD system, one for each basic color. Most professional cameras have a genlock input, which allows the camera to be synchronized to an external source. Some cameras also include basic character generators for titling purposes.

Video Capture – The process of converting analog video to digital video.

Video Capture Card – See Capture Card.

Video Carrier – A specific frequency that is modulated with video data before being mixed with the audio data and transmitted.

Video CD – An industry standard for storing MPEG-1 video on a CD.

Video Compression (M-JPEG and MPEG) – Both these standards use special hardware and software to store video directly on a hard drive. Video compression is done in various ratios (e.g., 10:1, 5:1). The higher the ratio, the more video can be stored per meg, and conversely the lower the compression, the higher the video quality. See CODEC.

Video Deck – An electronic component consisting of a video/audio head assembly, a system of transporting a videotape past the heads, and operational controls, used for recording and playback of videotape.

Video Digitizer – Similar to a frame grabber but requires longer than 1/30th of a second to digitize a complete frame and therefore cannot be used for motion video. Among the more popular Amiga video digitizers is NewTek's Digi-View.

Video Distribution Amplifier (VDA) – A special amplifier for strengthening the video signal so that it can be supplied to a number of video monitors at the same time.

Video Editing – A procedure for combining selected portions of video footage in order to create a new, combined version. A variety of editing consoles are available. During video editing, special effects such as wipes, dissolves, inserts, etc. can be added. Professional editing is done using time code recorded on every frame of the magnetic tape allowing single frame accuracy. Audio editing is often carried out simultaneously with video editing. The Thumbs Up offers a versatile solution for most editing applications.

Video Enhancer – A general term used to describe a device used to correct video image problems.

Video Equalizer – A device that corrects for unequal frequency losses and/or phase errors in the transmission of a video signal.

Video Fill – A video signal from a primary input or external input used to fill the hole made by a key signal.

Video for Windows® – Microsoft's older multimedia environment for the Windows operating system. You use Video for Windows® by installing several drivers and libraries in your Windows directories.

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-inch U-Matic, 3/4" U-Matic, 8 mm, Beta, Beta ED, Betacam, Betacam SP, SP, D-1, DCT, D-2, D-3, D-5, Digital Betacam, Hi8, M-II, VHS, and S-VHS.

Video Framestore – A device that enables digital storage of one or more images for steady display on a video monitor.

Video Gain – Expressed on the waveform monitor by the voltage level of the whitest whites in the active picture signal. Defined as the range of light-to-dark values of the image which are proportional to the voltage difference between the black and white voltage levels of the video signal. Video gain is related to the contrast of the video image.

Video Index – A data packet for carrying picture and program related source data in conjunction with the video signal. There are three classes of data to be included: Class 1 contains information that is required to know how to use the signal; Class 2 contains heritage information for better usage of the signal; Class 3 contains other information. The SMPTE Working Group on Video Index (P18.41) is developing the proposed recommended practice.

Video In-Line Amplifier – A device providing amplification of a video signal.

Video Interface Port (VIP) – A digital video interface designed to simplify interfacing video ICs together. One portion is a digital video interface (based on BT.656) designed to simplify interfacing video ICs together. A second portion is a host processor interface. VIP is a VESA specification.

Video Manager (VMG) – a) Top level menu linking multiple tiles from a common point. **b)** In DVD-Video, the information and data to control one or more Video Title Sets (VTS) and Video Manager Menu (VMGM). It is composed of the Video Manager Information (VMGI), the Video Object Set for Video Manager Menu (VMGM_VOBS), and a backup of the VMGI (VMGI_BUP).

Video Matrix Switcher (VMS) – A device for switching more than one camera, VCR, video printer and similar to more than one monitor, VCR, video printer and similar. Much more complex and more powerful than video switchers.

Video Mixer – A device used to combine video signals from two or more sources. Inputs are synchronized, then mixed along with various special effects patterns and shapes. A video mixer usually generates sync signals allowing genlocking of additional video sources to the first source. The Digital Video Mixer is capable of handling up to four video inputs.

Video Mixing – Video mixing is taking two independent video sources (they must be genlocked) and merging them together. See alpha mix.

Video Modulation – Converting a baseband video signal to an RF signal.

Video Module Interface – A digital video interface designed to simplify interfacing video ICs together. It is being replaced by VIP.

Video Monitor – A device for converting a video signal into an image.

Video Noise – Poor quality video signal within the standard video signal. Also called Snow.

Video On Demand (VOD) – True VOD implies completely random access to video. Users may access the video they want and when they want it. This is synonymous with dialing a video from a data bank and not having to go to a video rental store. In contrast, near-VOD often implies a set of TV channels showing the same movie, but with shifted starting times. Owing to the demanding nature of the application in sense of data capacity, compression techniques are needed. The bit rates applied in some VOD projects are comparable to that of CD-based video, which provides a reasonable picture quality and makes delivery possible by means of ADSL over copper cables of a length commonly found in telephony. The asymmetric digital subscriber line (ADSL) technology is typically used on distances up to about 5 to 6 km at 2 Mbit/s.

Video Path – The path that video takes through the switcher.

Video Printer – A special device used to capture a single frame of video to create a hard copy print.

Video Processing Amplifier (Video Procamp) – A device that stabilizes the composite video signal, regenerates the synchronizing pulses and can make other adjustments to the video signal.

Video Program System (VPS) – Information is included in the video signal to automatically control VCRs.

Video Projector – A display device which projects a video or computer image onto a large screen. The classic video projector has three primary color video tubes which converge on-screen to create the full color image. Single tube projectors eliminate convergence problems but compared to three tube systems, project a relatively lower quality image.

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 Sequence – a) A series of one or more pictures. **b)** In MPEG, the total, coded bit stream (the ES at system level). **c)** A video sequence is represented by a sequence header, one or more groups of pictures, and an end_of_sequence code in the data stream.

Video Server – A computer server that has been designed to store large amounts of video and stream it to users as required. Usually a video server has large amounts of high-speed disks and a large amount of network bandwidth to allow for many users to simultaneously view videos.

Video Session – The highest syntactic structure of coded video bitstreams. It contains a series of one or more coded video objects.

Video Signal – a) The electrical signal produced by video components. **b)** 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 Signal-to-Noise Ratio – An indication of the amount of noise in a black and white picture.

Video Slave Driver – A trademark of Avid Technology, Inc. A hardware component that synchronizes signal inputs, outputs, and conversions; selects audio frame rates; and selects pulldown of video frames.

Video Source – In editing, the players running the original videotapes.

Video Stream – a) In analog editing systems, also called a video playback source. **b)** In digital editing systems, a stream of data making up a digital video image.

Video Streaming – New technologies used to send video information over the internet. Rather than wait for the whole file to download, the video streaming technology lets the clip begin playing after only a few seconds.

Video Switcher – A device that allows transitions between different video pictures. May contain special effects generators. Also called production switcher or switcher.

Video Tape Recorder (VTR) – A device developed in Germany which permits audio and video signals to be recorded on magnetic tape.

Video Time Base Error – Where all components of the video signal jitter (change in time) together in relation to another video signal.

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

Video Titler – See Character Generator.

Video Units – See IRE Units.

Video Wall – A large array of several monitors, placed close to each other in the shape of a video screen or "wall". Each monitor is fed only part of the original video image by using a video-wall generating unit. This device is a digitally-based processor which converts the original analog video signal to digital, rescans, resamples and generates several individual analog video outputs for driving each array monitor separately. When viewed from a distance, the effect can be very dramatic.

Video, Composite Signal – The electric signal that represents complete color picture information and all sync signals. Includes blanking and the deflection sync signals to which the color sync signal is added in the proper time relationship.

Video, Peak – See White Clip, White Peak, White, Reference.

Video_TS – UDF filename used for the video directory on the disc volume. Files under this directory name contain pointers to the sectors on the disc that hold the program streams.

Video1 – The default video compression algorithm in Microsoft's Video for Windows. Can product 8- or 16-bit video sequences.

Videocassette – A length of videotape wound around two reels and enclosed in a plastic shell.

Videocassette Recorder (VCR) – An electronic component consisting of a tuner, an R modulator, and a video deck used for recording and playback of a videocassette.

VideoCD – Compact discs that hold up to about an hour of digital audio and video information. MPEG-1 video is used, with a resolution of 352 x 240 (29.97 Hz frame rate) or 352 x 288 (25 Hz frame rate). Audio uses MPEG-1 layer 2 at a fixed bit rate of 224 kbps, and supports two mono or one stereo channels (with optional Dolby pro-logic). Fixed bit-rate encoding is used, with a bit rate of 1.15 Mbps. The next generation, defined for the Chinese market, is Super VideoCD. XVCD, although not an industry standard, increases the video resolution and bit rate to improve the video quality over VCD. MPEG-1 video is still used, with a resolution of up to 720 x 480 (29.97 Hz frame rate) or 720 x 576 (25 Hz frame rate). Fixed bit-rate encoding is still used, with a bit rate of 3.5 Mbps.

Videography – Operation of a video camera or camcorder in video production.

Video-in-Black – A term used to describe a condition as seen on the waveform monitor when the black peaks extend through reference black level.

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

Videotape – a) Oxide-coated plastic-based magnetic tape used for recording video and audio signals. **b)** 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.

Videotext – Two-way interactive service that uses either two-way cable or telephone lines to connect a central computer to a television screen.

View Direction – This direction also requires three numbers, and specifies the direction in which the viewer is looking, and which direction is up.

Viewfinder – Camera feature that allows the operator to view the image as it is being recorded. Video viewfinders typically depict the recorded image in black-and-white.

Viewing Distance – Distance between image and a viewer's eyes. In television, the distance is usually measured in picture heights. In film it is sometimes measured in picture widths. As a viewer gets closer to a television set from a long distance, the amount of detail perceptible on the screen continually increases until, at a certain point, it falls off rapidly. At that point, scanning line or triad visibility is interfering with the viewer's ability to see all of the detail in the picture, sort of not being able to see the forest for the trees. The finer the triad or scanning structure, the closer to the screen this point can be (in picture heights). Therefore, high-definition screens allow either closer viewing for the same size screen or larger screens for the same physical viewing distance (not in picture heights). When the effects of scanning lines and triads are reduced, other artifacts (such as temporal alias of panning called strobing) may become more obvious. From far enough away, it is impossible to tell high-definition resolution from NTSC resolution.

Viewpoint – Viewpoint defines the location of the viewer's eye in the 3D world, as a (x, y, z) triplet of numbers. To define what is finally seen, the "view direction" must also be known.

Viewport – A rectangular subregion of the video image that is displayed using local decode. See Local Decode.

Vinegar Syndrome – Characteristic of the decomposition of acetate based magnetic tape where acetic acid is a substantial by-product that gives the tape a vinegar-like odor. After the onset of the vinegar syndrome, acetate tape backings degrade at an accelerated rate, the hydrolysis of the acetate is catalyzed further by the presence of acetic acid by-product.

VIR – See Vertical Interval Reference.

Virtual Connection – Packets of information share network resources but do not have dedicated physical transmission links. Thus network transit delays and network congestion effect delivery of the packets.

Virtual Reality (VR) – Computer-generated images and audio that are experienced through high-tech display and sensor systems and whose imagery is under the control of a viewer.

Virtual Source – A source clip that generates new frames as needed; it has no real beginning or end. Virtual sources can be trimmed to any extent.

VISCA (Video System Control Architecture) – A device control language for synchronized control of multiple video devices. The VISCA protocol is device- and platform-independent. See also LANC and V-Box.

Visible Scanning Lines – Normally considered a defect that affects perception of fine vertical detail. Scanning line visibility can also have an apparent sharpness increasing effect, however. See also Sharpness and Viewing Distance.

Visible Subcarrier – The most basic form of cross-luminance.

VISION 1250 – The organization, headquartered in Brussels, investigates the ways of developing European widescreen production and seeks to contribute to the deployment of digital and widescreen broadcasting and high definition video production. Specifically, the organization helps European producers in the making of programs through provision of technical expertise.

Vision Mixer – British video switcher.

VISTA (Visual System Transmission Algorithm) – The NYIT ATV scheme. VISTA is based on the inability of the human visual system to perceive high temporal and high spatial resolution simultaneously. It combines low frame rate, high line rate information with normal frame rate normal line rate information to create a channel-compatible, receiver-compatible signal plus a 3 MHz augmentation channel. Aspect ratio accommodation has been suggested by blanking adjustment, squeeze, and shoot and protect techniques. In spite of the relatively small size of NYIT's research center, VISTA was one of the first ATV schemes to actually be implemented in hardware.

Visual Acuity – The amount of detail perceptible by the human visual system. It depends on many factors, including brightness, color, orientation, and contract. Optimum viewing distance depends upon visual acuity.

VITC – See Vertical Interval Time Code.

Viterbi Algorithm – A forward error correction technique that improves performance in noisy communications environments.

Viterbi Decoding – Viterbi decoding makes use of the predefined time sequence of the bits through convolutional coding (DVB-S). Thanks to a series of logic decisions, the most probable correct way is searched for through the trellis diagram and incorrectly transmitted bits are corrected.

VITS – See Vertical Interval Test Signal.

VITS Inserter – Device that produces a test signal in the video in the vertical interval so as not to be visible to the home viewer but allows the broadcasters to test signal quality during transmission.

VL – See VESA Local Bus.

V-LAN – A registered trademark of Videomedia, Inc. An industry-standard software protocol for video device control. The V-LAN network allows a computer application to control and synchronize all connected VTRs, switchers, DATs, mixers, and DVEs.

VLC – See Variable Length Coding.

VLSI – See Very Large Scale Integration.

VLXi – A registered trademark of Videomedia, Inc. A series of controllers that control and synchronize professional video equipment for animation, video editing, HDTV, and broadcast television production.

VM (Verification Mode) – The set of video coding algorithms that precedes the actual MPEG-4 video coding specification.

VMD (Video Motion Detector) – A detection device generating an alarm condition in response to a change in the video signal, usually motion, but it can also be change in light. Very practical in CCTV as the VMD analyzes exactly what the camera sees, i.e., there are no blind spots.

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

VMI – See Video Module Interface.

VOB (Video Object) – Usually a group of pictures. The VO level includes everything in the bitstream about a particular video object. It includes all Video Object Layers (VOLs) associated with the object. Multiple video objects are represented by multiple VOs.

VOB Files – DVD-Video movies are stored on the DVD using VOB files. They usually contain multiplexed Dolby Digital audio and MPEG-2 video. VOB Files are named as follows: vts_XX_Y.vob where XX represents the title and Y the part of the title. There can be 99 titles and 10 parts, although vts_XX_0.vob never contains video, usually just menu or navigational information.

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

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

Vocoder – A coding method in speech that is based on representations of the structure of speech.

VOD (Video On Demand) – A system in which television programs or movies are transmitted to a single consumer, and then, only when requested.

Voice Activated Switching – Automatically switching the video feed to whomever is speaking in a multipoint video conference. Usually a function of the multipoint conferencing unit (MCU).

Voice Over – Narration added over video. The narrator, who is not recorded with the original video, explains or somehow supplements the visual images.

VOL (Video Object Layer) – Temporal order of a vop.

Volatile Memory – Memory devices whose stored data is lost when power is removed. RAMs can be made to appear nonvolatile by providing them with back-up power sources.

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

Volume Management Information – Identifies disc side and content type.

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

Volume Unit (VU) Meter – A device used for measuring the intensity of an audio signal.

VOP (Video Object Plane) – Instance of visual object (VO) at a point in time. Corresponds to a video frame.

VOP Reordering – The process of reordering the reconstructed vops when the coded order is different from the composition order for display. Vop reordering occurs when B-vops are present in a bitstream. There is no vop reordering when decoding low delay bitstreams.

VP (Virtual Path) – One of two types of ATM circuits identified by a VPI. A virtual path is a bundle of virtual channels, all of which are switched transparently across an ATM network based on a common VPI.

VPE (Virtual Path Entity)

VPI (Virtual Path Identifier) – 8-bit field in the header of an ATM cell. The VPI, together with the VCI, identifies the next destination of a cell as it passes through a series of ATM switches on its way to its destination. ATM switches use the VPI/VCI fields to identify the next VCL that a cell needs to transit on its way to its final destination. The function of the VPI is similar to that of the DLCI in Frame Relay.

VPME (Virtual Path Multiplexing Entity)

VPS – See Video Program System.

VPU (Video Presentation Unit) – A picture.

VRML (Virtual Reality Modeling Language) – Specification for displaying three-dimensional objects on the World Wide Web. Think of it as the 3D equivalent of HTML.

VS (Video Session) – The top video level of the MPEG-4 scene, and includes all video objects, natural or synthetic, in the scene.

VS (Visual Object Sequence) – The top video level of the MPEG-4 scene, and includes all video objects, natural or synthetic, in the scene.

VSAT (Very Small Aperture Satellite Terminal) – A small earth station for satellite transmission that handles up to 56 kbits/sec of digital transmission. VSATs that handle the T1 data rate (up to 1.544 Mbits/sec) are called “TSATs”.

VSB (Vestigial Sideband Modulation) – A modulation scheme used for terrestrial wired and over-the-air broadcasting. In analog broadcasting, one of the sidebands resulting form modulation is suppressed. In digital broadcasting, 8 VSB allows transport of 19.3 Mbps of useable data after forward error correction. 8 VSB in ATSC system implies eight discrete amplitude levels.

VSB-AM – See AM-VSB.

VSYNC (Vertical Sync) – See Sync.

VTR – See Video Tape Recorder.

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

VU (Volume Units) – A unit of measure for complex audio signals, usually in dB. 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.

V-V-V (Video-Video-Video) – A preview mode that shows a previously recorded scene, the new insert video, and then the previously recorded scene again.

▶ W

W3C (World Wide Web Consortium) – Develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential. W3C is a forum for information, commerce, communication, and collective understanding.

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

Wait State – When a system processor is reading or writing a memory or peripheral device that cannot respond fast enough, one or more time intervals (typically on the order of tens of nanoseconds each) are inserted during which the processor does nothing but wait for the slower device. While this has a detrimental effect on system throughput, it is unavoidable. The number of wait states can be reduced using techniques such as CPU-bus caches or write FIFOs.

Walking-Ones – Memory test pattern in which a single one bit is shifted through each location of a memory filled with 0s. A walking-zero pattern is the converse.

WAN (Wide Area Network) – A computer network that covers a large geographic area, such as a state. WANs may use telephone lines, fiber-optic cables, or satellite links for their long-distance connections. Some WANs are created by connecting several smaller LANs.

Wander – Long-term timing drift in digital networks. Causes loss of synchronization.

Warp – A special effect created by ADO to distort (twist) video pictures.

Warping – This video effect is related to morphing except that a warp consists of transforming one video image into one of a completely different type. For example, a scorebox might be twisted on and off a screen containing video action. Some examples of video transitions include fly-ons/offs, slide ons/offs, zoom in or out to/from a pinpoint, shattered glass transition, pixelization where on screen explodes into thousands of pixels and fades out at a controlled rate.

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

Wave – A continuous fluctuation in the amplitude of a quantity with respect to time. A wave will have a propagation velocity dependent on the medium through which it travels. For example, in air at 70°F, the propagation velocity of a sound pressure wave is 1130 feet per second.

WAVE – A file format (.wav) used to represent digitized sound.

Wave Velocity – The propagation velocity of a wave. The time it takes for one point of a waveform to travel a certain distance. Wave velocity is dependent on the medium through which the wave travels and the temperature of the medium.

Waveform – The shape of an electro-magnetic wave. A graphical representation of the relationship between volt-age or current and time.

Waveform Coding – Coding that aims to reconstruct the waveform of the original (audio) signal as close as possible, independently of the material. Includes linear PCM, differential PCM, adaptive differential PCM, sub-band coding, adaptive transform coding, etc.

Waveform Monitor – A piece of test equipment which displays waveforms (analog video signals) at a horizontal and/or vertical rate. A specialized oscilloscope for evaluating television signals. a) DC Restore – A circuit used in picture monitors and waveform monitors to clamp on point of the waveform to a fixed DC level. Typically the tip of the sync pulse or the back porch. This ensures the display does not move vertically with changes in the signal amplitude or average picture level (APL). The DC Restore speed can be set to SLOW or FAST DC. SLOW allows hums and other low frequency distortions to be seen. FAST DC removes the effects of hum from the display so it will not interfere with other measurements. b) AFC/Direct – This selection allows the waveform monitor’s horizontal sweep to trigger on each individual horizontal sync pulse (direct mode). This will allow the user to see any jitter that might be in the signal. Or the waveform monitor can trigger horizontally in the AFC mode which causes the horizontal sweep to trigger on the average value of the horizontal sync pulses. The AFC mode eliminates jitter.

Wavelength – In tape recording, the shortest distance between two peaks of the same magnetic polarity; also, the ratio of tape speed to recorded frequency.

Wavelet – a) A transform in the basic function that is not of fixed length but that grows longer as frequency is reduced. **b)** A compression algorithm that samples the video image based on frequency to encode the information. This creates a series of bands representing the data at various levels of visual detail. The image is restored by combining bands sampled at low, medium, and high frequencies.

Wavelet Transform – A time-to-frequency conversion which gives a constant bandwidth frequency analysis. It uses short windows at high frequencies and long windows at low frequencies.

Waveshape – The shape traced by the varying amplitude of the wave. See Waveform.

WD – See Working Draft.

Weave – Periodic sideways movement of the image as a result of mechanical faults in camera, printer or projector.

Wear Product – Any material that is detached from the tape during use. The most common wear products are oxide particles or agglomerates, portions of coating and material detached from the edges of the tape.

Weighting – a) A method of changing the distribution of the noise that is due to truncation by premultiplying values. **b)** In a sound level meter, this is a filter that creates a response that corresponds to the ear’s varying sensitivity at different loudness levels. A weighting corresponds to the sensitivity of the ear at lower listening levels. The filter design weights or is more sensitive in certain frequency bands than others. The goal is to obtain measurements that correlate well with the subjective perception of noise.

Weighting, ANSI A – The A-curve is a side bandpass filter centered at 2.5 kHz with ~20 dB attenuation at 100 Hz, and ~10 dB attenuation at 20 kHz. Therefore, it tends to heavily roll off the low end, with a more modest effect on high frequencies. It is essentially the inverse of the 30-phon (or 30 dB-SPL) equal-loudness curve of a Fletcher-Munson.

Weighting, ANSI B – The B-weighting curve is used for intermediate level sounds and has the same upper corner as the C-weighting, but the lower amplitude corner is 120 Hz.

Weighting, ANSI C – The C-curve is basically "flat", with -3 dB corners of 31.5 Hz and 8 kHz, respectively.

Weighting, CCIR 468 – This filter was designed to maximize its response to the types of impulsive noise often coupled into audio cables as they pass through telephone switching facilities. The CCIR 468-curve peaks at 6.3 kHz, where it has 12 dB of gain (relative to 1 kHz). From here, it gently rolls off low frequencies at a 6 dB/octave rate, but it quickly attenuates high frequencies at ~30 dB/octave (it is down -22.5 dB at 20 kHz, relative to +12 dB at 6.3 kHz).

Weighting, CCIR ARM (or CCIR 2 kHz) – This curve is derived from the CCIR 468-curve. Dolby Laboratories proposed using an average-response meter with the CCIR 468-curve instead of the costly true quasi-peak meters used by the Europeans in specifying their equipment. They further proposed shifting the 0 dB reference point from 1 kHz to 2 kHz (in essence, sliding the curve down 6 dB). This became known as the CCIR ARM (average response meter), as well as the CCIR 2 kHz-weighting curve.

Wet Signal – The output of an effect device, especially a reverb unit.

Wet-Gate Printing – A system of printing in which the original is temporarily coated with a layer of liquid at the moment of exposure to reduce the effect of surface faults

WG (Working Group) – A WG works a very specific area of technical standards. Usually, WGs develop standards that are scoped by approved NPs. The WGs produce successive WDs, and then CDs, and then the FDIS.

WGHDEP – SMPTE Working Group on High-Definition Electronic Production (N15.04). Now reformed as the SMPTE Committee on Hybrid Technology (H19).

Whip – A horizontal picture disturbance at an edit point, usually caused by timing mis-adjustments in the edit system.

Whip Pan – A quick movement of the camera from left to right or right to left which creates a blurred image. Also called Swish Pan.

White Balance – An electronic process used in camcorders and video cameras to calibrate the picture for accurate color display in different lighting conditions (i.e., sunlight vs. indoor incandescent). White balancing should be performed prior to any recording, typically by pointing the camera at a white object for reference.

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

White Clip – The maximum video signal excursion in the white direction permitted by the system.

White Compression – a) Amplitude compression of the signals corresponding to the white regions of the picture, thus modifying the tonal gradient. **b)** The reduction in gain applied to a picture signal at those levels corresponding to light areas in the picture, with respect to the gain at the level corresponding to the midrange light value in the picture. Note: The gain referred to in the definition is for a signal amplitude small in comparison with the total peak-to-peak picture signal involved. A quantitative evaluation of this effect can be obtained by a measurement of differential gain. The overall effect of white compression beyond bandwidth limiting is to reduce contrast in the highlights of the picture as seen on a monitor.

White Level – Level which defines white for the video system.

White Level Control – This is a name for the contrast or picture control. It describes a function that is otherwise not clearly spelled out in names of controls used on monitors. It is not a term found on a monitor control. (As "black level" clearly defines the brightness control function, "white level" more clearly defines the contrast or picture control function.)

White Noise – A random signal having the same energy level at all frequencies (in contrast to pink noise which has constant power per octave band of frequency).

White Peak – The maximum excursion of the picture signal in the white direction at the time of observation.

White Point – That point on the chromaticity diagram having the tristimulus of a source appearing white under the viewing conditions; i.e., a spectrally nonselective sample under the illumination of viewing conditions.

White, Reference – a) The light from a nonselective diffuse reflector (in the original scene) that is lighted by the normal illumination of the scene. That white with which the display device stimulates reference white of the original scene. **b)** In production context, reference white is defined as the luminance of a white card having 90% reflectance and subjected to scene illumination. It is expected that there will be the capability of some discrimination of surface texture or detail within that portion of the transfer function incorporating reference white.

Wide Screen Signaling System (WSS) – It is used on (B, D, G, H, I) PAL line 23 and (M) NTSC lines 20 and 283 to specify the aspect ratio of the program and other information. ITU-R BT.1119 specifies the WSS signal for PAL and SECAM system. EIAJ CPX-1204 specifies the WSS signal for NTSC systems.

Wide-Angle – Refers to camera lenses with short focal length and broad horizontal field of view.

Wideband – Relatively wide in bandwidth.

Widescreen – An image with an aspect ratio greater than 1.33:1 aspect ratio.

Widescreen Panels – Additional sections of picture information that can be added to a 1.33:1 aspect ratio picture to create a widescreen image.

Width – Refers to the width of recording tape, varying from 0.150" in cassette tape to 2.0" for video, mastering and instrumentation tapes. The size of the picture in a horizontal direction.

Width Border – The 4100 series name for a Hard Border.

Wild Sound, Wild Track – A recording of sound on either videotape or audiotape made without an accompanying picture.

Wind – The way in which tape is wound onto a reel. An A-wind is one in which the tape is wound so that the coated surface faces toward the hub; a B-wind is one in which the coated surface faces away from the hub. A uniform wind, as opposed to an uneven wind, is one giving a flat-sided tape pack free from laterally displaced, protruding layers.

Winder/Cleaner – A device designed to wind and clean magnetic tape in order to restore it to a quality that approaches the condition of a new tape, providing the tape has not been physically damaged.

Window – a) A portion of the screen that you can manipulate that contains text or graphics. **b)** Video containing information or allowing information entry, keyed into the video monitor output for viewing on the monitor CRT. **c)** 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. **d)** A graphical user interface that presents icons and tools for manipulating a software application. Most applications have multiple windows that serve different purposes.

Window Dub – Copies of videotape with "burned in" time code display. Hours, minutes, seconds and frames appear on the recorded image. Window dubs are used in off-line editing.

Window Function – In digital signal processing, a distortion is caused on the transformed waveform when a window function is applied to it.

Window Shades – See Side Panels.

Windowing – The video display is divided into two or more separate areas to display different material from different sources in each area.

Windows, Analog – All analog windowing architectures multiplex graphics and video as analog signals rather than as digital information, but they vary widely in signal manipulation and digital processing capabilities. While they do offer some advantages, analog architectures fail to address certain problems. For example, the graphics pixel-clock frequency becomes the pixel clock for the video image. Therefore, the greater screen resolution, the smaller the video window. Since enlarging the image means losing graphics resolution, the end user may find himself changing display drivers several times a day to fit the immediate task. The simplest analog architecture is the genlocked video overlay. Composite video is decoded into its RGB components. Having no control over the video source, the graphics controller must be genlocked to the video source, operating at a resolution and timing characteristic compatible with the incoming video signal. The graphics signal is switched in and out at appropriate times so that the graphic appears in the desired place in the image. The multiplexed output is then encoded into a new composite signal. The analog multiplexer, currently the most popular architecture, is actually a group of slightly varied architectures. The most popular variation imports the graphics data and pixel clock from the graphics card feature connector across a ribbon cable, where it is fed to a DAC. The video signal is digitized, color-converted, and scaled, then is stored in a frame buffer similar to a FIFO which synchronizes the data. When the video data emerges from the frame buffer, it is fed to a second DAC. The two DACs are connected to an analog multiplexer that is controlled by a set of counters that keep track of the beam position on the graphics display. When the beam enters the video-window area, the mux is switched from the graphics signal to the video signal.

Windows, Digital – Digital windowing offers a distinct advantage over analog. it digitizes the video image immediately, only converting it to analog as it is sent to the CRT. Incoming composite video is digitized and decoded to produce a YUV data stream, which then enters the video-processing pipeline (color-space and format conversion, scaling and/or zooming). After processing, the data is stored in the frame buffer. At the appropriate time, the data moves to the overlay controller, which serves as a digital multiplexer. Graphics data remains in digital form through the overlay controller; it is not converted to analog until the final DAC that drives the CRT.

Wipe – a) A transition between two video signals that occurs in the shape of a selected pattern. **b)** Any pattern system effect that reveals a new video, and more specifically, one that does not have an enclosed boundary on the screen. **c)** Special effect in which two pictures from different video sources are displayed on one screen. Special effects generators provide numerous wipe patterns varying from simple horizontal and vertical wipes to multi-shaped, multi-colored arrangements. The Digital Video Mixer includes this effect.

W**ireframe – a)** An image generated by displaying only the edges of all polygons or surfaces. **b)** A display option where solid or filled objects are represented by mesh lines and/or curves.

Wireless – Transmission of information using radio or microwave technologies.

Wireless Microphone System – A microphone system consisting of a microphone, an FM transmitter, and a tuned receiving station that eliminates the need for long runs of microphone cable.

WITNESS (Wireless Integrated Terminal and Network Experimentation and Services)

WMF (Windows Meta File) – The standard vector-based structure of the Windows operating system. Bitmapped images may be embedded in WMF files.

Word – Set of characters that occupies one storage location and is treated by the computer circuits as a unit. Ordinarily a word is treated by the control unit as an instruction and by the arithmetic unit as a quantity. See Byte.

Work Print – A film print made from the original negative that is used during the editing process to produce a cut list or edit decision list for final program assembly. Work prints are typically low-cost, one-light prints that receive heavy wear through repeated handling. See also Answer Print, Print, Release Print.

Working Draft (WD) – Preliminary stage of a standard but kept internal to MPEG for revision.

Workspace – The main window for working with icons and customizing your view of the file system. You place files and directories from all over the file system here for easy access; placing them in the Workspace does not change their actual location in the file system.

Workstation – The physical hardware that contains the CPU and graphics boards, a system disk, and a power supply. You connect it to a monitor, keyboard, and mouse to configure a working system. It is also sometimes referred to as the chassis.

World Coordinate System – See World Reference.

World Reference – The absolute coordinate system which is the root reference and upon which all other references are based. It cannot be animated.

World Standard – A television standard accepted in all parts of the world. CCIR recommendation 601 is currently the closest there is to a world standard. It is accepted throughout the world, but can be used with either 525-scanning line or 625-scanning line picture. HDTV 1125/60 Group is attempting to promote its system as a world HDEP standard, but Zenith suggests the same for 3XNTSC, and there are other candidates.

World System Teletext (WST) – ITU-R BT.653 525 line and 625 line system B teletext.

World Transmission Standards – For a definition of "TV" column codes. See Terrestrial Transmission Standards.

Country	TV	Color	Stereo	Subtitles
Albania	B/G	PAL		
Argentina	N	PAL-N		
Australia	B/G	PAL	FM-FM	TeleText
Austria	B/G	PAL	FM-FM	TeleText
Azores (Portugal)	B	PAL		
Bahamas	M	NTSC		
Bahrain	B	PAL		
Barbados	N	NTSC		
Belgium	B/G	PAL	Nicam	TeleText
Bermuda	M	NTSC		
Brazil	M	PAL-M	MTS	
Bulgaria	D	SECAM		
Canada	M	NTSC	MTS	CC
Canary Islands	B	PAL		
China	D	PAL		
Colombia	N	NTSC		
Cyprus	B	PAL		
Czech Republic	D/K	SECAM/PAL		
Denmark	B	PAL	Nicam	TeleText
Egypt	B	SECAM		
Faroe Islands (DK)	B	PAL		
Finland	B/G	PAL	Nicam	TeleText
France	E/L	SECAM		Antiope
Gambia	I	PAL		
Germany	B/G	PAL	FM-FM	TeleText
Germany (previously East)	B/G	SECAM/PAL		
Gibraltar	B	PAL		
Greece	B/H	SECAM		
Hong Kong	I	PAL	Nicam	
Hungary	D/K	SECAM		
Iceland	B	PAL		
India	B	PAL		
Indonesia	B	PAL		
Iran	H	SECAM		
Ireland	I	PAL	Nicam	TeleText
Israel	B/G	PAL		
Italy	B/G	PAL	FM/FM	TeleText
Jamaica	M	SECAM		
Japan	M	NTSC	MTS	
Jordan	B	PAL		
Kenya	B	PAL		
Luxembourg	B/G	PAL		TeleText
Madeira	B	PAL		
Madagascar	B	SECAM		
Malaysia	B	PAL		
Malta	B/G	PAL		
Mauritius	B	SECAM		
Mexico	M	NTSC	MTS	CC
Monaco	L/G	SECAM/PAL		
Morocco	B	SECAM		
Netherlands	B/G	PAL	FM-FM	TeleText
New Zealand	B/G	PAL	Nicam	TeleText
North Korea	D/K?	SECAM		
Norway	B/G	PAL	Nicam	
Pakistan	B	PAL		
Paraguay	N	PAL		
Peru	M	NTSC		
Philippines	M	NTSC		
Poland	D/K	PAL		TeleText
Portugal	B/G	PAL	Nicam	TeleText
Romania	G	PAL		
Russia	D/K	SECAM		
Saudi Arabia	B	SECAM		
Seychelles	I	PAL		
Singapore	B	PAL		
South Africa	I	PAL		
South Korea	N	NTSC		
Spain	B/G	PAL	Nicam	

Country	TV	Color	Stereo	Subtitles
Sri Lanka	B/G	PAL		
Sweden	B/G	PAL	Nicam	TeleText
Switzerland	B/G	PAL	FM-FM	TeleText
Tahiti	KI	SECAM		
Taiwan	M	NTSC		
Thailand	B	PAL		
Trinidad	M	NTSC		
Tunisia	B	SECAM		
Turkey	B	PAL		TeleText
United Arab Emirates	B/G	PAL		
United Kingdom	I	PAL	Nicam	TeleText
Uruguay	N	PAL		
United States	M	NTSC	MTS	CC
Venezuela	M	NTSC		
Yugoslavia	B/H	PAL		
Zimbabwe	B	PAL		

WORM (Write Once, Read Many) – A WORM is an optical drive where the data is recorded once (usually with a laser) but may be read many times. CD ROMs are WORMs.

Wow – Slow, periodic variations in the speed of the tape, characterized by its effect on pitch. A measure of non-uniform movement of magnetic tape or other recording parts.

WPP (Wipe to Preset Pattern) – See Preset Pattern.

Wrap – a) The length of the path along which tape and head are in intimate physical contact. **b)** A term used to signify the session (job) is finished.

Wrinkle – A physical deformity of the videotape. Any creases or wrinkle in the videotape may produce dropouts or loss of picture information upon playback. See Creasing.

Wrist Strap – A coiled cable with a loop for your wrist at one end and an alligator clip at the other. You fasten the clip to a metal part of the workstation and place the loop around your wrist whenever you work with internal components of the workstation to avoid electrical shocks to yourself and the components. See also Static Electricity.

Write – a) To transfer information, usually from a processor to memory or from main storage to an output device. **b)** To record data in a register, location, or other storage device.

Write Buffer – A term used to denote the buffer that is logically positioned between the CPU interface and the display memory.

Write-Through – A strategy where cache data is always written into main memory when data is written by the CPU. The write-through is done through the cache system.

WRS (Wireless Relay Station) – The WRS is a cost effective infrastructure building block providing improved or extended coverage in low traffic density applications (both indoor and outdoor). A WRS can be equipped with one directional antenna and one omnidirectional antenna to provide cost efficient public network access to users in remote areas.

WSS – See Wide Screen Signaling System.

WST – See World System Teletext.

W-VHS (Wide VHS) – A standard proposed by JVC, featuring a high resolution format and an aspect ratio of 16:9.

WYSIWYG (What You See Is What You Get) – Usually, but not always, referring to the accuracy of a screen display to show how the final result will look. For example, a word processor screen showing the final layout and typeface that will appear from the printer.

▶ X

X.25 – A standard networking protocol suite approved by the CCITT and ISO. This protocol suite defines standard physical, link, and networking layers (OSI layers 1 through 3). X.25 networks are in use throughout the world.

X.400 – The set of CCITT communications standards covering mail services provided by data networks.

XA – See CD-ROM XA.

X-Axis – The horizontal axis of a graph. When a television signal is examined in one dimension, the x-axis is usually time. When it is examined in three dimensions, the x-axis is usually horizontal resolution.

XGA (Extended Graphics Adapter) – IBM graphics standard that includes VGA and supports higher resolutions, up to 1024 pixels by 768 lines interlaced.

XLR – An audio connector characterized by three prongs covered by a metal sheath.

XML (Extensible Markup Language) – A simple, very flexible text format derived from the International Standards Organization's Standard Generalized Markup Language or SGML (ISO 8879). It was developed for electronic publishing and web page information exchange. Promoted at a method of exchanging metadata because it is easy to print and the printed material can be easily understood by users.

XMT (Extensible MPEG-4 Textual Format) – XMT is the use of a textual syntax to represent MPEG-4 3D scene descriptions. XMT was designed to provide content authors the ability to exchange their content with other authors while preserving their intentions in the text format. XMT provides interoperability between MPEG-4, Extensible 3D (X3D), and Synchronized Multimedia Integration Language (SMIL).

XSVCD (Extended Super VideoCD) – See Super VideoCD.

XVCD (Extended VideoCD) – See VideoCD.

XXX Profile Bitstream – A bitstream of a scalable hierarchy with a profile indication corresponding to xxx. Note that this bitstream is only decodable together with all its lower layer bitstreams (unless it is a base layer bitstream).

XXX Profile Decoder – Decoder able to decode one or a scalable hierarchy of bitstreams of which the top layer conforms to the specifications of the xxx profile (with xxx being any of the defined profile names).

XXX Profile Scalable Hierarchy – Set of bitstreams of which the top layer conforms to the specifications of the xxx profile.

XYZ – A 10-bit word with the two least significant bits set to zero to survive an 8-bit signal path. Contained within the standard definition "xyz" word are bit functions F, V, and H, which have the following values:

Bit 8 – (F-bit) 0 for field one and 1 for field two

Bit 7 – (V-bit) 1 in vertical blanking interval; 0 during active video lines

Bit 6 – (H-bit) 1 indicates the EAV sequence; 0 indicates the SAV

▶ Y

Y (Luma or Luminance) – a) This is an abbreviation or symbol for luminance, the black and white information in a television signal. **b)** Signal which is made up of 0.59G + 0.3R + 0.11B. c) It is the y-axis of the chart of the spectral sensitivity of the human visual system.

Y, C1, C2 – A generalized set of CAV signals: Y is the luminance signal, C1 is the 1st color difference signal and C2 is the 2nd color difference signal.

Y, Cb, Cr – The international standard ITU-R BT.601-1 specifies eight-bit digital coding for component video, with black at luma code 16 and white at luma code 235, and chroma in eight-bit two's complement form centered on 128 with a peak at code 224. This coding has a slightly smaller excursion for luma than for chroma: luma has 219 risers compared to 224 for Cb and Cr. The notation CbCr distinguishes this set from PbPr where the luma and chroma excursions are identical. For Rec. 601-1 coding is eight bits per component.

Y_8b = 16 + 219 * 9

Cb_8b = 128 +112 * (0.5/0.886) * (Bgamma – Y)

Cr_8b = 128 +112 * (0.5/0.701) * (Rgamma – Y)

Some computer applications place black at luma code 0 and white at luma code 255. In this case, the scaling and offsets above can be changed accordingly, although broadcast-quality video requires the accommodation for headroom and footroom provided in the CCIR-601-1 equations. ITU-R BT.601-1 Rec. calls for two-to-one horizontal subsampling of Cb and Cr, to achieve 2/3 the data rate of RGB with virtually no perceptible penalty. This is denoted 4:2:2. A few digital video systems have utilized horizontal subsampling by a factor of four, denoted 4:1:1. JPEG and MPEG normally subsample Cb and Cr two-to-one horizontally and also two-to-one vertically, to get 1/2 the data rate of RGB. No standard nomenclature has been adopted to describe vertical subsampling. To get good results using subsampling you should not just drop and replicate pixels, but implement proper decimation and interpolation filters. YCbCr coding is employed by D1 component digital video equipment.

Y, CR, CB – The three nonlinear video signals in which the information has been transformed into a luminance signal and two chrominance signals, each of which has been subject to nonlinear processing, and the chrominance signals at least have also been bandlimited. By convention, C'R, and C'B represent color-difference signals in digital format with typical excursion of values for 16 to 240.

Y, I, Q – The human visual system has less spatial acuity for magenta-green transitions than it does for red-cyan. Thus, if signals I and Q are formed from a 123 degree rotation of U and V respectively, the Q signal can be more severely filtered than I (to about 600 kHz, compared to about 1.3 MHz) without being perceptible to a viewer at typical TV viewing distance. YIQ is equivalent to YUV with a 33 degree rotation and an axis flip in the UV plane. The first edition of W.K. Pratt "Digital Image Processing", and presumably other authors that follow that bible, has a matrix that erroneously omits the axis flip; the second edition corrects the error. Since an analog NTSC decoder has no way of knowing whether the encoder was encoding YUV or YIQ, it cannot detect whether the encoder was running at 0 degree or 33 degree phase. In analog usage the terms YUV and YIQ are often used somewhat interchangeably. YIQ was important in the early days of NTSC but most broadcasting equipment now encodes equiband U and V. The D2 composite digital DVTR (and the associated interface standard) conveys NTSC modulated on the YIQ axes in the 525-line version and PAL modulated on the YUV axes in the 625-line version. The set of CAV signals specified for the NTSC system: Y is the luminance signal, I is the 1st color difference signal and Q is the 2nd color difference signal.

Y, Pb, Pr – If three components are to be conveyed in three separate channels with identical unity excursions, then the Pb and Pr color difference components are used. These scale factors limit the excursion of EACH color difference component to -0.5.. +0.5 with respect to unity Y excursion: 0.886 is just unity less the luma coefficient of blue. In the analog domain Y is usually 0 mV (black) to 700 mV (white), and Pb and Pr are usually + or -350 mV. YPbPr is part of the CCIR Rec. 709 HDTV standard, although different luma coefficients are used, and it is denoted E'Pb and E'Pr with subscript arrangement too complicated to be written here. YPbPr is employed by component analog video equipment such as M-II and Betacam; Pb and Pr bandwidth is half that of luma. A version of the (Y, R-Y, B-Y) signals specified for the SMPTE analog component standard.

Pb = (0.5/0.886) * (Bgamma – Y)

Pr = (0.5/0.701) * (Rgamma – Y)

Y, PR, PB – The three nonlinear video signals in which the information has been transformed into a luminance signal and two chrominance signals, each of which has been subject to nonlinear processing, and the chrominance signals at least have also been bandlimited. By convention, P'R and P'B represent color-difference signals in analog format, with typical excursion between -350 mV and +350 mV.

Y, R-Y, B-Y – The general set of CAV signals used in the PAL system as well as for some encoder and most decoder applications in the NTSC systems. Y is the luminance, R-Y is the 1st color difference signal and B-Y is the 2nd color difference signal.

Y, U, V – Luminance and color difference components for PAL systems. Y, U and V are simply new names for Y, R-Y and B-Y. The derivation from RGB is identical. In composite NTSC, PAL or S-Video, it is necessary to scale (B-Y) and (R-Y) so that the composite NTSC or PAL signal (luma plus modulated chroma) is contained within the range -1/3 to +4/3. These limits reflect the capability of composite signal recording or transmission channel. The scale factors are obtained by two simultaneous equations involving both B-Y and R-Y, because the limits of the composite excursion are reached at combinations of B-Y and R-Y that are intermediate to primary colors. The scale factors are as follows: U = 0.493 * (B-Y); V = 0.877 * (R-Y). U and V components are typically modulated into a chroma component: C = U*cos(t) + V*sin(t) where t represents the ~3.58 MHz NTSC color subcarrier. PAL coding is similar, except that the V component switches Phase on Alternate Lines (+ or -1), and the sub-carrier is at a different frequency, about 4.43 MHz. It is conventional for an NTSC luma signal in a composite

environment (NTSC or S-Video) to have 7.5% setup: Y_setup = (3/40) + (37/40) * Y. A PAL signal has zero setup. The two signals Y (or Y_setup) and C can be conveyed separately across an S-Video interface, or Y and C can be combined (encoded) into composite NTSC or PAL: NTSC = Y_setup + C; PAL = Y + C. U and V are only appropriate for composite transmission as 1-wire NTSC or PAL, or 2-wire S-Video. The UV scaling (or the IQ set, described below) is incorrect when the signal is conveyed as three separate components. Certain component video equipment has connectors labeled YUV that in fact convey YPbPr signals.

Y/C (Luminance and Chrominance) – A term used to describe the separation of video signal components used in systems such as Hi-8 and S-VHS. Generically called S-Video, all Videonics video products support the (Y/C) format.

Y/C Connections – Connections between videotape recorders and between videotape recorders and cameras, monitors, and other devices that keep luminance and chrominance separate and thus avoid cross-color and cross-luminance. See also S-Video.

Y/C Delay – A delay between the luminance (Y) and chrominance (C) signals.

Y/C Separator – a) Decoder used to separate luma and chroma in an (M) NTSC or (B, D, G, H, I) PAL system. b) 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.

Y/C Video – a) Shorthand for luma (Y) and chroma (C). **b)** A component video signal in which the luminance (Y) and chrominance (C) information are separate. S-VHS videocassette recorders use th Y/C video format.

Y-Axis – The vertical axis of a graph. When a television signal is examined in one dimension, the y-axis is usually signal strength. When it is examined in three dimensions, the y-axis is usually vertical resolution.

YCC (Kodak PhotoCD™) – Kodak's Photo YCC color space (for PhotoCD) is similar to YCbCr, except that Y is coded with lots of headroom and no footroom, and the scaling of Cb and Cr is different from that of Rec. 601-1 in order to accommodate a wider color gamut. The C1 and C2 components are subsequently subsampled by factors of two horizontally and vertically, but that subsampling should be considered a feature of the compression process and not of the color space.

Y_8b = (255/1.402) * Y

C1_8b = 156 + 111.40 * (Bgamma – Y)

C2_8b = 137 + 135.64 * (Rgamma – Y)

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

Yield Strength – The minimum force per unit cross-sectional area at which the tape or base film deforms without further increase in the load. Units are pounds per square inch (psi) or pounds per tape sample of given width and base film thickness.

YUV – a) A video system employing luminance and two chroma components directly related to the red and blue components. This professional component video system is used in studios and requires special equipment. Interface devices are used to link the various component systems, i.e., RGB, Y/C, YUV and YIQ (A system similar to YUV). **b)** A color model used chiefly for video signals in which colors are specified according to their luminance, the Y component, and their hue and saturation, the U and V components. See Hue, Luminance, Saturation. Compare RGB.

YUV2 – Intel's notation for 4:2:2 YCbCr format.

YUV9 – a) Intel's notation for compressed Y, U, V format that provides a compression ratio of 3 to 1. **b)** A bitstream format that does not compress the video signal, but converts it from the RGB into the YUV color model and averages pixel colors so that the signal uses only nine bits per pixel. See Compress, Encode, RGB, YUV. Compare YUV9.

YUV9C – A bitstream format that converts the video signal from RGB into the YUV color model, averages pixel colors so that the signal uses only nine bits per pixel, and then compresses the signal slightly. See Compress, Encode, RGB, YUV. Compare YUV9.

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.

▶ Z

Z – In electronics and television this is usually a code for impedance.

Z-Axis – An axis of a three-dimensional graph, which, when printed on a flat piece of paper, is supposed to be perpendicular to the plane of the paper. When a television signal is examined in three dimensions, the z-axis is usually time.

ZCLV (Zoned Constant Linear Velocity) – Concentric rings on a disc within which all sectors are the same size. A combination of CLV and CAV.

Zebra Pattern – A camera viewfinder display that places stripes over a part of an image which has reached a pre-determined video level, usually set at about 70 IRE units and used to ensure correct exposure of skin tones.

Zenith – a) The tilt of the head relative to a direction perpendicular to the tape travel. **b)** Major U.S. consumer electronics manufacturer and proponent of the 3XNTSC ATV scheme, also possibly the first organization to suggest pre-combing for NTSC.

Zero Carrier Reference – A 120 IRE pulse in the vertical interval which is produced by the demodulator to provide a reference for evaluating depth of modulation.

Zero Duration Dissolve – The method of editing two scenes end-to-end simultaneously.

Zero Modulation Noise – The noise arising when reproducing an erased tape with the erase and record heads energized as they would be in normal operation, but with zero input signal. This noise is usually 3-4 dB higher than the bulk erased noise. The difference between bulk erased and zero modulation noise is sometimes referred to as induced noise.

Zero Timing Point – The point at which all video signals must be in synchronization (typically the switcher input).

Zig-Zag Scan – Zig-zag scan of quantized DCT coefficient matrix. This gives an efficient run length coding (RLC).

Zig-Zag Scanning Order – a) A specific sequential ordering of the DCT coefficients from (approximately) the lowest spatial frequency to the highest. **b)** A specific sequential ordering of the 8 x 8 two-dimensional DCT coefficients into a linear array, ordering from the lowest spatial frequency to the highest.

Zoom – Type of image scaling. The process where a video picture is increased in size by processing pixels and lines through interpolation or replication. A 640 x 512 image will take up one quarter of a 1280 x 1024 screen. To fill the screen, the 640 x 512 image must be zoomed. Zooming makes the picture larger so that it can be viewed in greater detail.

Zoom Lens – A camera lens that can vary the focal length while keeping the object in focus, giving an impression of coming closer to or going away from an object. It is usually controlled by a keyboard with buttons that are marked zoom-in and zoom-out.

Zoom Ratio – A mathematical expression of the two extremes of focal length available on a particular zoom lens.

Zooming – The enlarging or minimizing of an image on a computer monitor to facilitate ease of viewing and accurate editing.

Zorro II/III – Amiga expansion slots. Zorro III, because of its 32-bit design improvements, provides a much faster data rate and therefore is preferred over Zorro II for use with video editing systems.

ZV Port (Zoomed Video Port) – Used on laptops, the ZV Port is a point-to-point unidirectional 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. The PC Card host adapter has a special multimedia mode configuration. If a non-ZV PC Card is plugged into the slot, the host adapter is not switched into the multimedia mode, and the PC Card behaves as expected. Once a ZV card has been plugged in and the host adapter has been switched to the multimedia mode, the pin assignments change. The PC Card signals A4-A25, SPKR#, INPACK# and IOIS16# are replaced by ZV Port video signals (Y0-Y7, UV0-UV7, HREF, VSYNC, PCLK) and 4-channel audio signals (MCLK, SCLK, LRCK, and SDATA).

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. It is discussed in BS.707, and is similar to the BTSC technique.

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