

Glossary



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4:1:1/4:2:2:

The abbreviations 4:1:1 and 4:2:2 refer to the sampling of luminance and color when a video signal is converted to a digital signal. '4' represents the luminance signal, which is sampled four times, while the color portion of the signal is sampled once (or twice) for every four samples of luminance. 4:1:1 is the sampling for NTSC video and 4:2:2 is the sampling for PAL.

A

ALPHA CHANNEL:

The alpha channel is used to mask colors partially or completely, which can be used to give transparency to an image.

ANAMORPHIC WIDESCREEN

Found on a large number of DVD's, anamorphic widescreen appears to squeeze a 1.78 picture shape into a 1.33 image area. Anamorphic widescreen horizontally uncompresses the picture for a widescreen TV set with greater "vertical" information. Also annotated as 16:9.

ANALOG VIDEO

A signal that represents data by electrical voltage levels that vary continuously over time. Normal signal levels are within 0.7 to 1 volt.

ANSI

American National Standards Institute, a nonprofit organization that promotes development of technological and electronic standards.

ANTI-ALIASING

Aliasing is a video and graphics flaw that appears as stair-stepping or jaggies on the edge of an object, especially curved objects. Anti-aliasing blends pixels that are different shades of the object's color to reduce the stair-stepping and give a smoother appearance.

ARTIFACTS

Undesirable elements or defects in a video picture—anything that appears in the video that you don't want there, such as noise, pixelation, and so on.

ASPECT RATIO

The proportions of a monitor defined by the width of a picture relative to its height. The aspect ratio for a standard television monitor is 4:3, or 4 wide by 3 high. HDTV, also known as widescreen, uses an aspect ratio of 16:9.

B**BALANCED AUDIO**

A method that uses three-conductor cables to send one audio signal: a negative signal, a positive signal, and ground. The ground cable gives shielding; it carries no signal. The negative and positive cables send signals that are 180-degree opposites, while outside noise is sent evenly along both cables. The balanced receiving device ignores the even signals and uses only the varying information from the two cables.

BANDWIDTH

Bandwidth measures the amount of information that can be sent each second. In video, bandwidth refers to the range of frequencies, measured in Hz, that can pass through a device without distortion. A monitor's refresh rate relies on high bandwidth: the higher the bandwidth, the more information you see and the sharper the picture you get. In computers, bandwidth refers to how much data, in bytes, can be sent each second.

BLACK BURST

A video signal that consists of sync, color burst, and black video. Black burst synchronizes, or genlocks, other video sources to the same sync and color information. In video studios, black burst generators lock the entire facility to a common signal (house sync or house black).

BLACK LEVEL

The voltage in a video signal, placed at 7.5 IRE units in North American NTSC, that corresponds to black on a television screen. Elements at or below black in the video signal will not appear in the display. (Black Level for PAL is equal to 0 IRE)

BLANKING INTERVAL

The period of time when the electron beam turns off after it scans an image onto the screen. Horizontal blanking occurs when the beam completes a scan line and it must shut off to retrace back to the left. Vertical blanking occurs when the beam completes a field and scans the last line at the bottom of the screen; it shuts off to return to the upper left.

BLANKING LEVEL

A low voltage (0 IRE units) at the end of each horizontal picture line that separates the picture information in the video signal from the synchronizing information. This voltage makes the electron beam invisible as it retraces to draw the next line.

BLOOMING

An effect that occurs on a monitor when color is too intense and seeps over the edges of an object. Thin lines and sharp edges may look thick and fuzzy. Blooming occurs when phosphors on the screen cannot handle the energy sent from the electron beam.

C**CCIR (INTERNATIONAL RADIO CONSULTATIVE COMMITTEE)**

Formerly the global organization responsible for establishing television standards. CCIR 601 was the standard for transmitting Digital Video Component information that is recorded by the D1 machine. The CCIR became the ITU.

CHROMINANCE

The color information of a video signal, separate from the luminance information. Saturation and hue are aspects of chrominance. Black, gray, and white have no chrominance.

CLIPPING

A distortion where the peaks of the signal are chopped off.

CODEC

(Compression/Decompression) The algorithm that handles the compression and decompression of video or audio files.

COLOR BARS

An electronically-generated video pattern that consists of eight colors of equal width. The pattern establishes a proper color reference for recording, playback, and adjustment.

COLOR BURST

Part of the composite signal that contains a short sample of the sub-carrier frequency. Color burst is a synchronization reference that gives frequency and phase information about hue and saturation; color monitors use color burst to decode the color portion of a video signal.

COLOR CORRECTION

Electronically altering the color of a television image to meet defined standards.

COLOR PHASE

The correct timing relationship in a color display. Color is in phase when the hue is reproduced correctly.

COLOR SUBCARRIER

The frequency added to a luminance signal that carries color information (3.58 MHz/NTSC or 4.43 MHz/PAL signal). The sub-carrier frequency is too high to be detected by black and white televisions. Color televisions use circuitry that detects and decodes the color component for display.

COMPONENT VIDEO

A video signal that sends color information through three channels. The three channels can be Red, Green, and Blue (RGB) or YUV (Y, R-Y, and B-Y, where Y is luminance). The component signal offers higher quality for production.

COMPOSITE VIDEO

A video signal that combines luminance, chrominance, blanking pulses, sync pulses and color burst in one channel.

COMPRESSION

Decreasing the data in a video so that it uses less storage space and transfers more quickly.

CROSSFADE

To fade out one audio track while another audio track simultaneously replaces it.

D

D1/D2/D3

Digital video recording and playback formats. D1 uses component video and D2 and D3 use composite video. Digitized video avoids problems such as generation loss. Digital formats mainly use a 19mm wide magnetic tape (3/4").

dB (DECIBEL)

A standard unit to measure the power of audio and video signals using the ratio of two amounts of electric or acoustic signal power. Technically, this is equal to 20 times the common logarithm of the voltage or current ratio. It indicates the logarithmic ratio of output power divided by input power. A power loss of 3dB attenuates the incoming signal by half of its original value. A 3dB *power* loss is equal to a 6dB *voltage* loss. This method of scaling levels becomes important because human sensitivity to sight and sound are logarithmic, which accounts for our large dynamic range capability.

DIFFERENTIAL GAIN

A change in luminance level that causes a change in the sub-carrier amplitude of a video signal. The television picture will show a change in color saturation caused by a simultaneous change in picture brightness.

DISTRIBUTION AMPLIFIER

A device that connects an input source to multiple output sources such as monitors or projectors.

DISSOLVE

One video signal fades out while another video signal simultaneously replaces it.

DSK (DOWNSTREAM KEYING)

A keyer that lets you overlay video, titles, graphics and so on while video switching and effects occur behind it.

DVD (DIGITAL VIDEO DISC OR DIGITAL VERSATILE DISK)

A 12cm optical disc format used for data storage. Commonly used to distribute movies.

DROP-FRAME TIME CODE

SMPTE timecode format that continuously counts 30 frames per second but drops 2 frames from the count every minute except every tenth minute (drops 108 frames each hour). It is necessary because the frame rate of NTSC video is 29.97 frames per second rather than 30 frames.

DROPOUT

Brief lapse of video or audio during playback on a tape machine, which is caused by a sudden loss of tape contact with the playback head or flaws in the tape.

E**EDL (EDIT DECISION LIST)**

A list of edit decisions collected in a computer video editor, which are time references for where transitions occur for scenes on the original videotape. The list typically includes the source, in time, and out time for each edit.

ENG (ELECTRONIC NEWS GATHERING)

ENG uses a portable video camera and recorder to record news events in the field.

EQUALIZATION

In audio, to improve sound quality by increasing or decreasing the gain of the signal at various frequencies.

F**FADE**

To dissolve a video picture to a color, pattern or title. In audio, to decrease the volume until it is no longer audible.

FIELD

One-half of an interlaced video picture; a complete vertical scan of a field contains 262.5 lines (NTSC) or 312.5 lines (PAL). Two fields make up a video frame, where adjacent lines are located in alternate fields.

FIREWIRE

An interface standard (IEEE1394) that allows high speed data transfer.

FRAME

A complete video image that consists of two fields; a frame has 525 interlaced horizontal lines of picture information in NTSC, 625 in PAL.

FRAMES PER SECOND (FPS)

The number of frames in each second of video. NTSC uses 29.97 fps and PAL uses 25 fps.

FREQUENCY

The number of complete cycles of a periodic waveform that occur in a given length of time. Usually specified in cycles per second (Hertz).

G**GAIN**

An increase in signal power or voltage when a signal is transmitted from one point to another through an amplifier. Gain is expressed in decibels above a reference level; opposite of attenuation.

GENERAL PURPOSE INTERFACE (GPI)

1. A method of connection that allows remote control over certain functions of a device, using one wire for each function. 2. A non-specific interface between equipment, usually a serial connection (RS232 or RS422 format) between computer modules.

GENERATION

The number of duplications between an original recording and a copy. Second generation is a copy of the original master; third generation is a copy of the copy of the original master, and so on.

GENERATION LOSS

Loss of color, detail, sync, etc., that appears when you copy a videotape. Tape and circuitry limitations cause generation loss.

GENLOCK

A method of locking the synchronization and burst of a video signal with that of another signal.

H**HERTZ (Hz)**

Frequency in cycles per second.

HORIZONTAL BLANKING (RETRACE)

The process when an electron beam in a monitor is shut off, or blanked, so that the beam can return to the left side of the screen to begin a new scan line.

HUE

The dominant wavelength that distinguishes a particular color, such as red or yellow.

HUM

Unwanted mix of 60Hz power sine wave into other electrical signals. In audio, a hum can be heard; in video, hum appears as waves in the picture.

I**IMPEDANCE**

The opposition, or load, to a signal. Circuits for audio or video signals work with a certain load, or impedance; typical video impedances: 75 ohm or High Z.

INTERLACING

Each video frame is divided into two fields, and interlacing is the process of scanning the lines for these alternating fields so that they fall between each other.

IRE (INSTITUTE OF RADIO ENGINEERS)

A measurement of the luminance of the video signal that divides 1 Volt Peak-Peak video into 140 IRE units. The IRE unit is meant to make the numbers for luminance levels easier to communicate. The amplitude of the video signal from blanking (zero volts) to peak white is 0.714286 volts or 100 IRE units. Synchronization signals extend from blanking to - 0.285714 volts or - 40 IRE units.

ITU (INTERNATIONAL TELECOMMUNICATIONS UNION)

The ITU, headquartered in Geneva, Switzerland is an international organization within which governments and the private sector coordinate global telecom networks and services.

L**LAVALIERE MICROPHONE**

A small microphone that is often attached to clothing.

LED

Light Emitting Diode.

LUMINANCE

The amount of light in a picture; the black and white portion of the video signal.

M

MICROPHONE PREAMPLIFIER

A signal path enhancer; microphones produce very low signal levels and a preamplifier boosts to the output signal to a level compatible with audio circuitry.

MHz

Abbreviation for megahertz, a unit of measurement for a million cycles per second.

MULTIMEDIA

A presentation, delivered through a computer, that combines different types of content (video, audio, still images, graphics, animation, text, etc.).

N

NON-INTERLACED

See Progressive.

NOISE

Disturbance or interference to an electrical signal. Video noise appears as snow, graininess, ghost images or picture static induced by external sources such as the national power-line grid, electric motors, fluorescent lamps, etc. Audio noise appears as hiss and static.

NTSC (NATIONAL TELEVISION STANDARDS COMMITTEE)

Standard for television broadcasting in the North America, parts of South America, and Japan, featuring 525 lines per frame and 30 frames (29.97) per second at 60 Hz.

O

ONLINE

Production editing of sufficiently high quality to be used for broadcast or distribution.

OFFLINE

Production editing of lower resolution than broadcast standards; when a vast amount of raw footage exists, it is often captured at low resolution to determine final edits, then only necessary clips are re-digitized in full resolution.

OVERLAY

To superimpose computer graphics over a video signal and store the resulting video image on videotape. Overlay is often used to add titles to videotape. Traditionally in video, sources must be synced for overlay to work properly.

OVERSCAN

Video images may exceed the size of the screen on a consumer monitor by five to ten percent. This excess video leaves some flexibility so that the active image will appear correctly on a variety of television sets. The extra area is the overscan area, and video professionals plan for critical action to occur only in the center, which is the safe area. Professional monitors can display the overscan area. The area within a 5% line around the edges of the picture is the Safe Action area. The area inside a 10% line is the Safe Title area. The Overscan Test Pattern is VE T15 C7 or VE T17 C8.

P**PAL (PHASE ALTERNATE LINE)**

Standard for television broadcasting in Western Europe featuring 625 lines per frame and 25 frames per second at 50 Hz. The phase of the color carrier alternates from line to line and it takes four full pictures for the color to horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors, which is the reason a hue control is not needed on PAL television sets.

PCI

Peripheral Component Interconnect; a bus (chip) that communicates large amounts of information (high bandwidth) to the motherboard; usually 32-bit or 64-bit.

PHASE

The timing of a signal in relation to another signal; the timing of a color in relation to the color burst signal. If the cycle of the color burst signal is represented as 360° along a time axis, the phase position for a color is expressed as an angle. If you change the sub-carrier phase of video colors you change the hue of the colors in the signal.

PIXEL

A single picture element with a defined location on a display screen.

POST PRODUCTION

Work performed on video and audio, such as color correction, editing, adding titles and special effects, and audio mixing.

PROGRESSIVE

A method by which all the video scan lines are represented on the screen in one sweep instead of two.

PSA (PUBLIC SERVICE ANNOUNCEMENT)

Spots aired at no charge by television stations; they usually fill gaps where no one has purchased advertising time. Thus, the bulk of PSA's tend to run in the middle of the night.

R**RAID**

(Redundant Array of Independent Drives): RAID combines multiple small, inexpensive disk drives into a single logical drive or "disk array" with performance that exceeds a more expensive high speed disk drive.

REAL-TIME

An operating mode where the computer receives and processes data almost instantly, so that the user does not wait while the computer processes.

RESOLUTION

In video, a measure of the ability of a television to reproduce detail. Generally determined by establishing the number of horizontal lines that can be distinguished on a test pattern.

RGB (RED, GREEN, AND BLUE)

The basic components of the color television system. They are also the primary colors of light, not to be confused with Cyan, Magenta, and Yellow, the primary pigments. Also the palette used for computer displays.

RETRACE

An electron beam scans a picture onto a screen from left to right; before scanning the next line, the beam must return to the left side of the screen, which is an action called retrace.

S

SAFE TITLE AREA

The 80% area of the display that can display legible titles regardless of how a TV monitor is adjusted.

SERIAL PORT

A computer I/O (input/output) port on the computer; the serial port uses a single wire or pair of wires to transmit and receive data to and from external devices. The standard serial port uses RS-232 or RS-422 protocols.

SIGNAL

A waveform that sends information from one point to another.

SIGNAL-TO-NOISE-RATIO (S/N)

The strength of an audio or video signal in relation to background noise. The ratio is measured in decibels. A higher ratio in video gives you a cleaner picture, with less snow. A higher ratio in audio gives you cleaner sound.

SMPTE (SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS)

A global organization, based in the United States that sets standards for baseband visual communications, including film and video.

SPOT

Short-hand for commercial.

STORYBOARD

A graphical representation of the project, indicating talent positions and camera angles. In editing, a Storyboard is a clip-to-clip representation of the project. Storyboard editing is valuable for quickly roughing out the project.

S-VIDEO (SEPARATED VIDEO)

A video signal that separates Luminance (Y) and Chrominance (C). Also called Y/C.

STRIPED DRIVES

Combining two or more disk drives into a single storage unit. The ancestors of RAID arrays were groups of striped drives.

SYNC (SYNCHRONIZATION)

The precise alignment of two signals or functions. Horizontal sync is a timing pulse that identifies the start of each new line. Vertical sync identifies the start of a new field. Color burst sends frequency and phase information.

T

TALLY LAMP

A signal lamp or LED on a video camera that alerts the talent or operator that a camera is live.

TBC (TIME BASE CORRECTOR)

A device that corrects problems with sync pulses by generating a clean time base and synchronizing incoming video to this reference.

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.

TIMECODE

A digital code that labels each frame of a video by hours:minutes:seconds:frames (00:00:00:00); this is used in editing to make frame accurate edits.

TITLING

Text and graphics added to a video image.

U

UNDERSCAN

Reducing a video or computer image so that all four edges are visible on-screen, leaving it surrounded by black borders. Underscan can show what happens during the blanking period and the beginning and end of scan lines and frames. Underscanning can uncover latent image problems for identification and correction.

V

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 CAPTURE CARD

A PCI card that lets you record video onto your computer's hard drive. These cards use hardware and/or software compression (CODEC) to digitize the video onto your hard drive.

VTR

(Video Tape Recorder) a professional recording deck used with the Betacam format.

Y

Y/C (LUMINANCE AND CHROMINANCE)

A signal that separates video into luminance and chrominance; Also called S-Video.

YUV

A signal that separates video into one luminance portion and two chrominance portions; the chrominance directly relates to red and blue components. YUV, or Component, is a professional format.