

GLOSSARY OF COMMON CCTV TECHNICAL TERMS

AGC

Automatic Gain Control. A circuit for automatically controlling amplifier gain in order to maintain a constant output voltage with a varying input voltage within a predetermined range of input-to-output variation.

Aperture

In television optics, it is the effective diameter of the lens that controls the amount of light reaching the photoconductive or photoemitting image pickup sensor.

Aperture Correction

Compensation for the loss in sharpness of detail because of the finite dimensions of the image elements or the dot-pitch of the monitor.

Aspect Ratio

The ratio of width to height for the frame of the televised picture. 4:3 for standard systems, 5:4 for 1K x 1K, and 16:9 for HDTV.

Attenuation

In general terms, a reduction in signal strength.

Auto Balance

A system for detecting errors in color balance in white and black areas of the picture and automatically adjusting the white and black levels of both the red and blue signals as needed for correction.

Auto Light Range

The range of light, e.g., sunlight to moonlight, over which a TV camera is capable of automatically operating at specified output.

Automatic Brightness Control

In display devices, the self-acting mechanism which controls brightness of the device as a function of ambient light.

Automatic Frequency

An arrangement whereby the frequency of an oscillator is automatically maintained within specified limits.

Automatic Gain Control

A process by which gain is automatically adjusted as a function of input or other specified parameter.

Automatic Iris Lens

A lens that automatically adjusts the amount of light reaching the imager.

Automatic Light Control

The process by which the illumination incident upon the face of a pickup device is automatically adjusted as a function of scene brightness.

Back Porch

That portion of the composite picture signal which lies between the trailing edge of the horizontal sync pulse and the trailing edge of the corresponding blanking pulse.

Bandwidth

The number of cycles per second (Hertz) expressing the difference between the lower and upper limiting frequencies of a frequency band; also, the width of a band of frequencies.

Bar Test Pattern

Special test pattern for adjusting color TV receivers or color encoders. The upper portion consists of vertical bars of saturated colors and white. The lower horizontal bars have black and white areas and I and Q signals.

Blooming

The defocusing of regions of the picture where the brightness is at an excessive level, due to enlargement of spot size and halation of the fluorescent screen of the cathode-ray picture tube. In a camera, sensor element saturation and excess which causes widening of the spatial representation of a spot light source.

Bounce

Sudden variations in picture presentation (brightness, size, etc.,) independent of scene illumination.

Brightness

The attribute of visual perception in accordance with which an area appears to emit more or less light. (Luminance is the recommended name for the photo-electric quantity which has also been called brightness.)

Broadband

In television system use, a device having a bandpass greater than the band of a single VHF television channel.

Burned-In-Image

Also called burn. 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 or, on a monitor screen.

CCD

See Charge Coupled Device

C Mount

A television camera lens mount of the 16 mm format, 1 inch in diameter with 32 threads per inch.

CCTV

Common abbreviation for Closed-Circuit Television.

Charge-Coupled Device

CCD. For imaging devices, a self-scanning semiconductor array that utilizes MOS technology, surface storage, and information transfer by shift register techniques.

Chroma

That quality of color which embraces both hue and saturation. White, black, and grays have no chroma.

Chroma Control

A control of color television receiver that regulates the saturation (vividness) of colors in a color picture.

Chroma Detector

Detects the absence of chrominance information in a color encoder input. The chroma detector automatically deletes the color burst from the color encoder output when the absence of chrominance is detected.

Chromatic Aberration

An optical defect of a lens which causes different colors or wave lengths of light to be focused at different distances from the lens. It is seen as color fringes or halos along edges and around every point in the image.

Chromaticity

The color quality of light which is defined by the wavelength (hue) and saturation. Chromaticity defines all the qualities of color except its brightness.

Chrominance

A color term defining the hue and saturation of a color. Does not refer to brightness.

Chrominance Signal

That portion of the NTSC color television signal which contains the color information.

Clamp

A device which functions during the horizontal blanking or synchronizing interval to fix the level of the picture signal at some predetermined reference level at the beginning of each scanning line.

Clamping

The process that established a fixed level for the picture level at the beginning of each scanning line.

Clipping

The shearing off of the peaks of a signal. For a picture signal. This effects the positive (white).

Coaxial Cable

A particular type of cable capable of passing a wide range of frequencies with very low signal loss. Such a cable in its simplest form, consists of a hollow metallic shield with a single wire accurately placed along the center of the shield and isolated from the shield.

Color Burst

That portion of the composite color signal, comprising a few cycles of a sine wave of chrominance subcarrier frequency, which is used to establish a reference for demodulating the chrominance signal. Normally approximately 9 cycles of 3.579545 MHz.

Color Edging

Extraneous colors appearing at the edges of colored objects, and differing from the true colors in the object.

Color Encoder

A device which produces an NTSC color signal from separate R, G, and B video inputs.

Color Fringing

Spurious colors introduced into the picture by the change in position of the televised object from field to field.

Color Purity

The degree to which a color is free of white or any other color. In reference to the operation of a tri-color picture tube it refers to the production of pure red, green or blue illumination of the phosphor dot face plate.

Color Saturation

The degree to which a color is free of white light.

Color Sync Signal

A signal used to establish and to maintain the same color relationships that are transmitted.

Color Transmission

The transmission of a signal which represents both the brightness values and the color values in a picture.

Composite Video Signal

The combined picture signal, including vertical and horizontal blanking and synchronizing signals.

Compression

The reduction in gain at one level of a picture signal with respect to the gain at another level of the same signal.

Contrast

The range of light to dark values in a picture or the ratio between the maximum and minimum brightness values.

Contrast Range

The ratio between the whitest and blackest portions of television image.

Convergence

The crossover of the three electron beams of a three-gun tri-color picture tube. This normally occurs at the plane of the aperture mask.

Crosstalk

An undesired signal from a different channel interfering with the desired signal.

dB

Basically, a measure of the power ratio of two signals. In system use, a measure of the voltage ratio of two signals, provided they are measured across a common impedance.

Decoder

The circuitry in a color TV receiver which transforms the detected color signals into a form suitable to operate the color tube.

Definition

The fidelity of a television system to the original scene.

Depth of Field

The in-focus range of a lens or optical system. It is measured from the distance behind an object to the distance in front of the object when the viewing lens shows the object to be in focus.

Depth of Focus

The range of sensor-to-lens distance for which the image formed by the lens is clearly focused.

Digital Signal Processing

An algorithm within the camera that digitizes data (the image). Examples include automatic compensate for backlight interference, color balance variations and corrections related to aging of electrical components or lighting. Functions such as electronic pan and zoom, image annotation, compression of the video for network transmission, feature extraction and motion compensation can be easily and inexpensively added to the camera feature set.

Distortion

The deviation of the received signal waveform from that of the original transmitted waveform.

Distribution Amplifier

A device that provides several isolated outputs from one looping or bridging input, and has a sufficiently high input impedance and input-to-output isolation to prevent loading of the input source.

Dynamic Range

The difference between the maximum acceptable signal level and the minimum acceptable signal level.

EIA Sync

The signal used for the synchronizing of scanning specified in EIA Standards RS-170, RS-330, RS-343, or subsequent issues.

Equalizer

An electronic circuit that introduces compensation for frequency discriminative effects of elements within the television system, particularly long coaxial transmission systems.

Fiber Optics

Also called optical fibers or optical fiber bundles. An assemblage of transparent glass fibers all bundled together parallel to one another. The length of each fiber is much greater than its diameter. This bundle of fibers has the ability to transmit a picture from one of its surfaces to the other around curves and into otherwise inaccessible places with an extremely low loss of definition and light, by a process of total reflection.

Field

One of the two equal but vertically separated parts into which a television frame is divided in an interlaced system of scanning. A period of 1/60 second separates each field start time.

Field of View

The maximum angle of view that can be seen through a lens or optical instrument.

Focal Length

Of a lens, the distance from the focal point to the principal point of the lens.

Focal Plane

A plane (through the focal point) at right angles to the principal point of the lens.

Focal Point

The point at which a lens or mirror will focus parallel incident radiation.

Footcandle

See lumen/ft².

Footlambert (FL)

A unit of luminance equal to 1/candela per square foot or to the uniform luminance at a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square foot. A lumen per square foot is a unit of incident light and a footlambert is a unit of emitted or reflected light. For a perfectly reflecting and perfectly diffusing surface, the number of lumens per square foot is equal to the number of footlamberts.

Frame

The total area, occupied by the television picture, which is scanned while the picture signal is not blanked.

Frame Frequency

The number of times per second that the frame is scanned. The U.S. standard is 30 frames per second.

Frame Transfer

A CCD imager where an entire matrix of pixels is read into storage before being output from the camera. Differs from Interline Transfer where lines of pixels are output

Frequency Interlace

The method by which color and black and white sideband signals are interwoven within the same channel bandwidth.

Frequency Response

The range of band of frequencies to which a unit of electronic equipment will offer essentially the same characteristics.

Front Porch

The portion of a composite picture signal which lies between the leading edge of the horizontal blanking pulse and the leading edge of the corresponding sync pulse.

f/Stop

Also called F Number and F System. Refers to the speed or ability of a lens to pass light. It is calculated by dividing the focal length of the lens by its diameter.

Gain

An increase in voltage or power, usually expressed in dB.

Gamma

A numerical value, or the degree of contrast in a television picture, which is the exponent of that power law which is used to approximate the curve of output magnitude versus input magnitude over the region of interest.

Gamma Correction

To provide for a linear transfer characteristic from input to output device.

Genlock

A device used to lock the frequency of an internal sync generator to an external source.

Ghost

A spurious image resulting from an echo.

Gray Scale

Variations in value from white, through shades of gray, to black on a television screen. The gradations approximate the tonal values of the original image picked up by the TV camera.

Hue

Corresponds to colors such as red, blue, etcetera.

Hum

Electrical disturbance at the power supply frequency or harmonics thereof.

Image Intensifier

A device coupled by fiber optics to a TV image pickup sensor to increase sensitivity. Can be single or multi stage.

Image Plane

The plane at right angles to the optical axis at the image point.

Impedance (input or output)

The input or output characteristic of a system component that determines the type of transmission cable to be used. The cable used must have the same characteristic impedance as the component. Expressed in ohms. Video distribution has standardized on 75-ohm coaxial and 124-ohm balanced cable.

Incident Light

The light that falls directly on an object.

Insertion Loss

The signal strength loss when a piece of equipment is inserted into a line.

Interference

Extraneous energy which tends to interfere with the reception of the desired signals.

Interline Transfer

A technology of CCD design, where rows of pixels are output from the camera. The sensor's active pixel area and storage register are both contained within the active image area. This differs from "frame transfer" cameras that move all active pixels to a storage register outside of the active area.

Interlaced Scanning

A scanning process for reducing image flicker 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.

Iris

An adjustable aperture built into a camera lens to permit control of the amount of light passing through the lens.

Isolation Amplifier

An amplifier with input circuitry and output circuitry designed to eliminate the effects of changes made at either upon the other.

Jitter

Small, rapid variations in a waveform due to mechanical disturbances or to changes in the characteristic of components. Supply voltages, imperfect synchronizing signals, circuits, etc.

Lens

A transparent optical component consisting of one or more pieces of optical glass with surfaces so curved (usually Spherical), that they serve to converge or diverge the transmitted rays of an object, thus forming a real or virtual image of that object.

Lens Preset Positioning

Follower Pots are installed on lens that allows feedback to the controller information relevant to zoom and focus positioning allowing the controller to quickly adjust to a preselected scene and arrive in focus at the proper focal length automatically.

Lens Speed

Refers to the ability of a lens to transmit light, represented as the ratio of the focal length to the diameter of the lens. A fast lens would be rated $<f/1.4$; a much slower lens might be designated as $> f/8$. The larger the f number, the slower the lens.

Light

Electromagnetic radiation detectable by the eye, ranging in wavelength from about 400 to 750 nm.

Line Amplifier

An amplifier for audio or video signals that feeds a transmission line; also called program amplifier.

Loop Through

Also called looping. The method of feeding a series of high impedance circuits (such as multiple monitor/displays in parallel) from a pulse or video source with a coax transmission line in such a manner that the line is bridged (with minimum length stubs)

and that the last unit properly terminates the line in its characteristic impedance. This minimizes discontinuities or reflections on the transmission line.

Loss

A reduction in signal level or strength, usually expressed in dB. Power dissipation serving no useful purpose.

Low-Frequency Distortion

Distortion effects which occur at low frequencies. In television, generally considered as any frequency below the 15.75-kHz line frequency.

Lumen (LM)

The unit of luminous flux. It is equal to the flux through a unit solid angle (steradian) from a uniform point source of one candela or to the flux on a unit surface of which all points are at a unit distance from a uniform point source of one candela.

Lumen/FT²

A unit of incident light. It is the illumination on a surface one square foot in area on which a flux of one lumen is uniformly distributed, or the illumination at a surface all points of which are at a distance of one foot from a uniform source of one candela.

Luminance

Luminous intensity (photometric brightness) of any surface in a given direction per unit of projected area of the surface as viewed from that direction, measured in footlamberts (fl).

Luminance Signal

That portion of the NTSC color television signal which contains the luminance or brightness information.

Lux

International System (SI) unit of illumination in which the meter is the unit of length. One lux equals one lumen per square meter.

Matrix Switcher

A combination or array of electromechanical or electronic switches which route a number of signal sources to one or more designations.

Modulation

The process, or results of the process, whereby some characteristic of one signal is varied in accordance with another signal. The modulated signal is called the carrier. The carrier may be modulated in three fundamental ways: by varying the amplitude, called amplitude modulation; by varying the frequency, called frequency modulation; by varying the phase, called phase modulation.

Monitor

A unit of equipment that displays on the face of a picture tube the images detected and transmitted by a television camera.

Monochrome

Black and white with all shades of gray.

Monochrome Signal

In monochrome television, a signal wave for controlling the brightness values in the picture. In color television, that part of the signal wave which has major control of the brightness values of the picture, whether displayed in color or in monochrome.

Monochrome Transmission

The transmission of a signal wave which represents the brightness values in the picture, but not the color (chrominance) values.

ND Filter

A filter that attenuates light evenly over the visible light spectrum. It reduces the light entering a lens, thus forcing the iris to open to its maximum.

Noise

The word "noise" originated in audio practice and refers to random spurts of electrical energy or interference. In some cases, it will produce a "salt-and-pepper" pattern over the televised picture. Heavy noise is sometimes referred to as "snow".

Non-Composite Video

A video signal containing all information except sync.

NTSC

Abbreviation for National Television Systems Committee. A committee that worked with the FCC in formulating standards for the present day United States color television system.

Output

The signal level at the output of an amplifier or other device.

Pan and Tilt

A device upon which a camera can be mounted that allows movement in both the azimuth (pan) and in the vertical plane (tilt).

Pan/Tilt Preset Positioning

Follower pots are installed on pan/tilt unit to allow feedback to the controller and provides information relevant to horizontal and vertical positioning, allowing the controller to quickly adjust to a pre-selected scene automatically.

Patch Panel

A panel where circuits are terminated and facilities provided for interconnecting between circuits by means of jacks and plugs.

Peak Pulse Amplitude

The maximum absolute peak value of a pulse, excluding those portions considered to be unwanted, such as spikes.

Peak-to-Peak

The amplitude (voltage) difference between the most positive and the most negative excursions (peaks) of an electrical signal. A full video signal measures one volt peak to peak.

Picture Element

See Pixel

Pixel

Short for Picture Element. A pixel is the smallest area of a television picture capable of being delineated by an electrical signal passed through the system of part thereof. The number of picture elements (pixels) in a complete picture, and their geometric characteristics of vertical height and horizontal width, provide information on the total amount of detail which the raster can display and on the sharpness of the detail, respectively.

Primary Colors

Three colors wherein no mixture of any two can produce the third. In color television these are the additive primary colors red, blue and green.

Progressive Scan

The progressive scan format outputs data from the camera (the signal) in sequential order as it is scanned. The scan format produces a full frame of video in a continuous stream, rather than half the image per output sequence in traditional RS-170 CCD cameras. Standard RS-170 video is interlaced and output in two separate fields, generating essentially half the image at a time. With Cohu's new 6600 Series Progressive Scan Camera, a new, full image is output from the camera every 1/60th second, making it ideal for machines to more quickly process and display information, or act according to programmed instructions.

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 a distance equal to picture height.

Resolution, Limiting

The details that can be distinguished on the television screen. Vertical resolution refers to the number of horizontal black and white lines that can be resolved in the picture height. Horizontal resolution refers to the black and white lines resolved in a dimension equal to the vertical height and may be limited by the video amplifier bandwidth.

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 theoretically be seen in a picture.

Retained Image

Also called image burn. A change produced in or on the target which remains for a large number of frames after the removal of a previously stationary light image and which yields a spurious electrical signal corresponding to that light image.

RF (Radio Frequency)

A frequency at which coherent electromagnetic radiation of energy is useful for communication purposes. Also, the entire range of such frequencies.

Ripple

Amplitude variations in the output voltage of a power supply caused by insufficient filtering.

Roll

A loss of vertical synchronization which causes the picture to move up or down on a receiver or monitor.

Saturation

In color, the degree to which a color is diluted with white light or is pure. The vividness of a color, described by such terms as bright, deep, pastel, pale, etc. Saturation is directly related to the amplitude of the chrominance signal.

Scanning

The process of moving the electron beam of a pickup tube or a picture tube across the target or screen area of a tube.

Sensitivity

In television, a factor expressing the incident illumination upon a specified scene required to produce a specified picture signal at the output terminals of a television camera.

Shutter

Ability to control the integration (of light) time to the sensor to less than 1/60 second; e.g: stop motion of moving traffic.

Signal-to-Noise Ratio

The ratio between useful television signal and disturbing noise or snow.

Snow

Heavy random noise.

Spike

A transient of short duration, comprising part of a pulse, during which the amplitude considerably exceeds the average amplitude of the pulse.

Standard Minimum Signal

1000 microvolts at 75 ohms (0dB mV) in RF systems; 0.7-VPP non-composite, 1-VPP composite in video systems.

Sync

A contraction of "synchronous" or "synchronize".

Sync Generator

A device for generating a synchronizing signal.

Sync Level

The level of the peaks of the synchronizing signal.

Sync Signal

The signal employed for the synchronizing of scanning.

Synchronizing

Maintaining two or more scanning processes in phase.

Tearing

A term used to describe a picture condition in which groups of horizontal lines are displaced in an irregular manner.

Test Pattern

A chart especially prepared for checking overall performance of a television system. It contains various combinations of lines and geometric shapes. The camera is focused on the chart, and the pattern is viewed at the monitor for fidelity.

Transients

Signals which exist for a brief period of time prior to the attainment of a steady-state condition. These may include overshoots, damped sinusoidal waves, etc.

Vertical Resolution

The number of horizontal lines that can be seen in the reproduced image of a television pattern.

Video Amplifier

A wideband amplifier used for passing picture signals.

Video Band

The frequency band width utilized to transmit a composite video signal.

Video Signal (Non-Composite)

The picture signal. A signal containing visual information and horizontal and vertical blanking (see also Composite Video Signal) but not sync.

Y Signal

A signal transmitted in color television containing brightness information. This signal produces a black and white picture on a standard monochrome receiver. In a color picture it supplies fine detail and brightness information.

Zoom

To enlarge or reduce, on a continuously variable basis, the size of a televised image primarily by varying lens focal length.

Zoom Lens

An optical system of continuously variable focal length, the focal plane remaining in a fixed position.