A

active tap A cable television feeder device consisting of a directional coupler and a hybrid splitter (e.g., a conventional subscriber tap), in addition to an amplifier circuit.

adjacent channel (1) Any two television channels spaced 6 MHz apart. (2) The channel (frequency band) immediately above or below the channel of interest.

ambient temperature The temperature surrounding apparatus and equipment. Synonymous with room temperature.

amplifier Device used to increase the operating level of an input signal. Used in a cable system's distribution plant to compensate for the effects of attenuation caused by coaxial cable and passive device losses.

amplitude The size or magnitude of a voltage or current waveform; the strength of a signal.

amplitude modulation (AM) The form of modulation in which the amplitude of the signal is varied in accordance with the instantaneous value of the modulating signal.

amplitude modulated link (AML) A form of microwave communications using amplitude modulation for the transmission of television and related signals.

analog Pertaining to signals in the form of continuously variable physical quantities.

antenna Any structure or device used to collect or radiate electromagnetic waves.

antenna array A radiating or receiving system composed of several spaced radiators or elements.

attenuator A device for reducing the amplitude of a signal.

audio Relating to sound or its reproduction; used in the transmission or reception of sound.

audio frequency A frequency lying within the audible spectrum (the band of frequencies extending from about 20 Hz to 20 kHz).

aural carrier The carrier that has the audio portion of a television channel. A television channel usually contains both a visual and an aural carrier. An aural carrier is sometimes referred to as a sound carrier.

aural center frequency (1)The average frequency of an emitted signal when modulated by an aural (audio) signal. (2) The frequency of the emitted wave without modulation. Usually refers to frequency modulation methods.

automatic tilt Automatic correction of changes in tilt, or the relative level of signals of different frequencies.

B

bandwidth (1) A measure of the information carrying capacity of a communication channel. The bandwidth corresponds to the difference between the lowest and highest frequency signal that can be carried by the channel. (2) The range of usable frequencies that can be carried by a cable television system.

black level That level of picture signal corresponding to the maximum limit of black peaks.

bridging amplifier An amplifier connected directly into the main trunk of the cable television system. It serves as a sophisticated tap, providing isolation from the main trunk, and has multiple high-level outputs that provide signals to the feeder portion of the distribution network. Synonymous with bridger and distribution amplifier.

broadband Any system able to deliver multiple channels and/or services to its users or subscribers. Generally refers to cable television systems. Synonymous with wideband.

C

cable television A broadband communications technology in which multiple television channels as well as audio and data signals are transmitted either one way or bidirectionally through a distribution system to single or multiple specified locations. The term also encompasses the associated and evolving programming and information resources that have been and are being developed at the local, regional, and national levels.

cable television relay station (CARS) A fixed or mobile microwave communications station used for the transmission of television and related audio signals, FM broadcast stations, cablecasting, data or other information, or test signals for reception at one or more fixed receiving points from which the signals are then distributed to the public by cable.

cable television system A broadband communications system capable of delivering multiple channels of entertainment programming and non-entertainment information from a set of centralized antennas, generally by coaxial cable, to a community. Many cable television designs integrate microwave and satellite links into their overall design, and some now include optical fibers as well. Often referred to as cable television, which usually stands for community antenna television system.

carrier An electromagnetic wave of which some characteristic is varied in order to convey information.

carrier-to-noise ratio The ratio of amplitude of the carrier to the noise power relative to a 4 MHz bandwidth in the portion of the spectrum occupied by the carrier. Also referred to as the C/N ratio, or C/N.

CATV Abbreviation for community antenna television or cable television system. A cable television system is a broadband communications system that provides multiple channels from centralized antennas.

certificate of compliance Authorization issued by the FCC for the operation of a cable television system in a community or for the carriage of additional television signals by an operating cable television system.

channel A signal path of specified bandwidth for conveying information.

channel capacity In a cable television system, the number of channels that can be simultaneously carried on the system. Generally defined in terms of the number of 6 MHz (television bandwidth) channels for NTSC.

channel frequency response (1) The relationship within a cable television channel between amplitude and frequency of a constant amplitude input signal as measured at a subscriber terminal. (2) The measure of amplitude frequency distortion within a specified bandwidth.

co-channel interference Interference on a channel caused by another signal operating on the same channel.

coaxial cable A type of cable used for broadband data and cable systems. Composed of a center conductor, insulating dielectric, conductive shield, and optional protective covering, this type of cable has excellent broadband frequency characteristics, noise immunity, and physical durability. Synonymous with coax.

Community Antenna Television System See **CATV**.

composite The effect of several distortion signals present within a very narrow bandwidth. See discrete.

composite second-order beat (CSO) (1) A clustering of second order beats 1.25 MHz above and below the visual carriers in cable systems. (2) A ratio, expressed in decibels, of the peak level of the visual carrier to the peak of the average level of the cluster of second-order distortion products located 1.25 MHz above the visual carrier.

composite triple beat (CTB) (1) A clustering of third-order distortion products around the visual carriers in cable systems. (2) A ratio, expressed in decibels, of the peak level of the visual carrier to the peak of the average level of the cluster of third-order distortion products centered around the visual carrier.

continuous sweep mode The spectrum analyzer condition where traces are automatically updated each time trigger conditions are met.

converter Also known as processor. Device for changing the frequency of a television signal. A cable head end converter changes signals from frequencies at which they are broadcast to clear channels that are available on the cable distribution system. A set-top converter is added in front of a subscriber's television receiver to change the frequency of the midband, superband, or hyperband signals to a suitable channel or channels (typically a low- VHF channel) which the television receiver is able to tune.

cross modulation A form of television signal distortion where modulation from one or more television channels is imposed on another channel or channels.

CSO See **composite second-order beat.**

CTB See **composite triple beat**.

D

dB See **decibel**.

dBc Decibel carrier. A ratio expressed in decibels that refers to the gain or loss relative to a reference carrier level.

dBm See **decibel milliwatt**.

dBmV See **decibel millivolt**.

decibel (dB) A unit that expresses the ratio of two power levels on a logarithmic scale.

decibel millivolt (dBmV) A unit of measurement referenced to one millivolt across a specified impedance (75 ohms in cable television).

decibel milliwatt (dBm) A unit of measurement referenced to one milliwatt across a specified impedance.

decibels In spectrum analyzer operation, a general term used to denote a decrease of signal magnitude in transmission from one point to another. Attenuation may be expressed as a scalar ratio of the input to the output magnitude in decibels.

demodulate To retrieve an information- carrying signal from a modulated carrier.

demodulator A device that removes the modulation from a carrier signal.

distortion An undesired change in waveform of a signal in the course of its passage through a transmission system.

distribution amplifier See **bridging amplifier**.

distribution system The part of a cable television system consisting of trunk and feeder cables that are used to carry signals from the system head end to subscriber terminals. Often applied, more narrowly, to the part of a cable television system starting at the bridger, amplifiers. Synonymous with trunk and feeder system.

drift A change in the output of a circuit that occurs slowly.

E

electromagnetic interference Any electromagnetic energy, natural or man-made, which may adversely affect performance of the system.

electromagnetic spectrum The frequency range of electromagnetic radiation that includes radio waves, light and X-rays. At the low frequency end are subaudible frequencies (i.e., 10 Hz) and at the other end, extremely high frequencies (e.g., X-rays, cosmic rays).

F

fiber optics The technology of guiding and projecting light for use as a communications medium. Hair-thin glass fibers that allow light beams to be bent and reflected with low levels of loss and interferences are known as "glass optical wave guides" or simply "optical fibers."

field One-half of a complete picture (or frame) interval, containing all of the odd or even scanning lines of the picture.

field frequency The rate at which a complete field is scanned, nominally 60 times per second for NTSC monochrome video signals, and 59.94 times per second for NTSC color video signals .

field strength The intensity of an electromagnetic field at a given point, usually referred to in microvolts per meter.

field strength meter (FSM) A frequency selective heterodyne receiver capable of tuning to the frequency band of interest; in cable television, 5 to 750 MHz and above with indicating meter showing the magnitude input of voltage and a dial indicating the approximate frequency. Synonymous with signal level meter.

FM modulator In cable television, a device similar to an FM transmitter that is used to cablecast signals in the FM band on a cable system.

frame One complete picture consisting of two fields of interlaced scanning lines.

frequency band splitter/mixer A device similar to other splitters except that it provides branching on a frequency division basis.

frequency modulation (FM) A form of modulation in which the frequency of the carrier is varied in accordance with the instantaneous value of the modulating signal.

frequency response The peak-to-peak variation in the displayed signal amplitude over a specified center frequency range. Frequency response is typically specified in terms of ±dB relative to the value midway between the extremes. It also may be specified relative to the calibrator signal.

H

harmonic distortion (1) The generation of harmonics by the circuit or device with which the signal is processed. (2) Unwanted harmonic components of a signal .

harmonically related carriers Harmonically related carriers (HRC) is a tune configuration where each video carrier is a multiple of 6 MHz. This configuration masks composite triple-beat distortion by zero-beating the composite triple-beat distortion with the video carriers.

head end The control center of a cable television system, where incoming signals are amplified, converted, processed, and combined into a common cable, along with any origination cablecasting, for transmission to subscribers. System usually includes antennas, preamplifiers, frequency converters, demodulators, modulators, processors, and other related equipment.

herringbone An interference pattern in a television picture, appearing as either moving or stationary rows of parallel diagonal or sloping lines superimposed on the picture information.

hertz (Hz) A unit of frequency equivalent to one cycle per second.

heterodyne processor An electronic device used in cable head ends that down-converts an incoming signal to an intermediate frequency for filtering, signal level control, and other processing, and then reconverts that signal to a desired output frequency.

HRC See **harmonically related carriers.**

hub A point in the distribution system used to redistribute signals from the head end. Usually the hub is fed the cable broadband signals by a fiber optic or CARS band link.

hum modulation Undesired modulation of the television visual carrier by power-line frequencies or their harmonics (e.g., 60 or 120 Hz), or other low-frequency disturbances.

Hz See **hertz.**

I

impedance The combined effect of resistance, inductive reactance, and capacitive reactance on a signal at a particular frequency. In cable television, the nominal impedance of the cable and components is 75-ohms.

incremental coherent carriers (ICC/IRC) A cable plan in which all channels except 5 and 6 correspond with the standard channel plan. The technique is used to reduce composite triple-beat distortions. Synonymous with incrementally related carriers.

incrementally related carriers Incrementally related carriers (IRC) is a tune configuration where all channels except channels 5 and 6 are standard channels (see **standard tune configuration** for a definition of standard channels).

ingress The unwanted leakage of interfering signals into a cable television system.

insertion test signals See **vertical interval reference test signal**.

IRC See **incrementally related carriers.**

L

leakage Undesired emission of signals out of a cable television system, generally through cracks in the cable, corroded or loose connections, or loose device closures. Synonymous with signal leakage.

line extender Feeder line amplifiers used to boost signal and thereby extend the useful range of the feeder cable.

line frequency (1) The number of times per second that the scanning spot crosses a fixed vertical line in one direction. (2) Related to commercial power line frequency, i.e., 60 Hz. (3) The horizontal scanning rate of a video signal. For NTSC video, 15.734 kHz.

low noise amplifier (LNA) A low noise signal booster used to amplify the weak signals received on a satellite antenna.

low noise block converter A combination device used on satellite antennas that includes both a low noise amplifier (LNA) to boost the weak signals, and a block downconverter to convert the incoming satellite signals to a lower band of frequencies (e.g., 70-1450 MHz).

low-frequency interference Interference effects that occur at low frequency, generally considered as any frequency below 15.734 kHz.

M

main trunk The major cable link or "backbone" from the headend to a community or between communities.

matching transformer An impedance matching device which converts the 75-ohm impedance of the subscriber drop to the 300- ohm impedance of a television or FM receiver.

megahertz (MHz) One million cycles per second.

microsecond One millionth of a second.

microwave A very short wavelength electromagnetic wave, generally above 1000 MHz.

modulate To vary the amplitude, frequency, or phase of a carrier or signal in accordance with the instantaneous amplitude and/or frequency changes of the modulating intelligence.

modulation The process whereby original information can be translated and transferred from one medium to another. Information originally carried as a variation in a particular property (such as amplitude) of one process is transferred and carried as a corresponding variation in some possible different property (such as duration) of the new process.

N

narrow band A relative term referring to a system that carries a narrow- frequency range (sometimes used to refer to frequency bandwidths below 1 MHz). In a telephone/television context, telephone would be considered narrow band (3 kHz) and television would be considered broadband (6 MHz).

National Cable Television Association (NCTA) Washington, D.C.-based trade association for the cable television industry; members are cable television system operators; associate members include cable hardware and program suppliers and distributors, law and brokerage firms, and financial institutions. NCTA represents the cable television industry before state and federal policy makers and legislators. Name was changed in 1969 from National Community Television Association.

NCTA See **National Cable Television Association**.

noise Random burst of electrical energy or interference which may produce a "salt-and-pepper" pattern over a television picture. Heavy noise is sometimes called "snow."

noise factor Ratio of input signal-to-noise ratio to output signal-to-noise ratio.

noise figure The amount of noise added by signal-handling equipment (e.g., an amplifier) to the noise existing at its input, usually expressed in decibels.

noise temperature The temperature that corresponds to a given noise level from all sources, including thermal noise, source noise, and induced noise.

NTSC video signal A 525-line color-video signal whose frequency spectrum extends from 30 Hz to 4.2 MHz. NTSC video consists of 525 interlaced lines, with a horizontal scanning rate of 15,734 Hz, and a vertical (field) rate of 59.94 Hz. A color subcarrier at 3.579545 MHz contains color hue (phase) and saturation (amplitude) information .

O

off-the-air tune configuration The tune configuration for signals that are broadcast over the air and received with an antenna.

P

passive device A device basically static in operation; that is, it is not capable of amplification or oscillation, and requires no power for its intended function. Examples include splitters, directional couplers, taps, and attenuators.

performance standards Certain minimum technical requirements, established by the appropriate regulatory body, which must be met by a cable system operator.

pilot subcarrier A subcarrier serving as a control signal for use in the reception of stereophonic broadcasts.

pilot carrier Signals on cable television systems used to operate attenuation (gain) and frequency response (slope) compensating circuitry in amplifiers.

plant (*slang*) The head end and distribution hardware of a cable television system.

R

radiofrequency (RF) An electromagnetic signal above the audio and below the infrared frequencies.

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, that can be seen in three-quarters of the width of the picture. This information usually is derived by observation of the vertical edge of a test pattern. A picture that is sharp and clear and shows small details has 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 on the size of the scanning spots.

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, that 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.

response time The time interval between the instant a signal or stimulus is applied to or removed from a device or circuit, and the instant the circuit or device responds or acts.

ride out (*slang*) Making a customer or equipment service call or measurement session at a tap somewhere in the distribution system.

S

scrambled To alter an electronic signal so that a decoding device is necessary to receive the signal.

second harmonic In a complex wave, a signal component whose frequency is twice the fundamental, or original, frequency.

second-order beat Even-order distortion product created by two signals mixing or beating against each other.

sidebands Additional frequencies generated by the modulation process, which are related to the modulating signal and contain the modulating intelligence.

signal level meter (SLM) See **field strength meter**.

signal leakage See **leakage**.

signal level Amplitude of signal voltage measured across 75-ohms, usually expressed in decibel millivolts.

signal-to-noise ratio The ratio, expressed in decibels, of the peak voltage of the signal of interest to the root-mean-square voltage of the noise in that signal.

splitter Usually a hybrid device, consisting of a radiofrequency transformer, capacitors, and resistors, that divides the signal power from an input cable equally between two or more output cables.

spurious signals Any undesired signals such as images, harmonics, and beats.

standard tune configuration The tune configuration in which the channels are at the frequencies that the Electronic Industries Association (EIA) and FCC define to be the standard channel frequencies.

STD See **standard tune configuration.**

subcarrier A carrier used to modulate information upon another carrier, for example, the difference channel subcarrier in an FM stereo transmission.

suckout (1) The result of the coaxial cable's center conductor, and sometimes the entire cable, being pulled out of a connector because of contraction of the cable. (2) A sharp reduction of the amplitude of a relatively narrow group of frequencies within the cable system's overall frequency response.

sync generator An electronic device that supplies common synchronizing signals to a system of several video cameras, switchers, and other video production equipment, ensuring that all will be "locked" to a master timing reference.

sync level The level of the tips of the synchronizing pulses, usually 40 IRE units from blanking to sync tip.

synchronization The maintenance of, one operation in frequency and/or in phase with another.

synchronization pulse A transmitted pulse that is used to synchronize the electron beam of a picture monitor with the scanning device of the transmission source.

synchronous For transmission, operation of the sending and receiving instruments continuously at the same frequency .

system noise That combination of undesired and fluctuating disturbances within a cable television channel that degrades the transmission of the desired signal.

system impedance The resistance and reactance opposing the current flow in the system. For cable television the impedance is 75 ohms. See also **impedance**.

T

television channel The range or band of the radiofrequency spectrum assigned to a television station. In Canada and the United States, the standard bandwidth is 6 MHz.

terminal isolation The attenuation, at any subscriber terminal, between that terminal and any other subscriber terminal in the cable television system.

third harmonic In a complex wave, a signal component whose frequency is three times the fundamental, or original, frequency.

third-order beat See **triple beat**.

tilt compensation The action of adjusting, manually or automatically, amplifier frequency/gain response to

compensate for different cable length frequency/attenuation characteristics.

trap (1) A passive device used to block a channel or channels from being received by a cable television subscriber (negative trap), or used to remove an interfering carrier from a channel that a subscriber wants to receive (positive trap). (2) An unprogrammed, conditional jump to a specified address that is automatically activated by hardware, a recording being made of the location from which the jump occurred.

triple beat Odd order distortion products created by three signals, mixing or beating against each other, whose frequencies fall at the algebraic sums of the original frequencies. Synonymous with third-order beat.

truck roll (*slang*) Using a cable television company vehicle to make a service call.

trunk amplifier An amplifier inserted into a trunk line. A weak input signal is amplified before being retransmitted to an output line, usually carrying a number of video voice or data channels simultaneously. Amplifiers increase the range of a system. Usually, trunk amplifiers must be inserted approximately every 1,500 to 2,000 feet.

trunk The main distribution lines leading from the head end of the cable television system to the various areas where feeder lines are attached to distribute signals to subscribers.

tune configuration Refers to the correlation between the channel numbers and the frequency to which a channel is assigned. For example, the frequency at which channel 1 is broadcast differs between the HRC and IRC tune configurations.

U

units Dimensions on the measured quantities. Units usually refer to amplitude quantities because they can be changed. In spectrum analyzers with microprocessors, available units are dBm (dB relative to 1 mW dissipated in the nominal input impedance of the spectrum analyzer), dBmV (dB relative to 1 mV), dBV (dB relative to 1 V), volts, and, in some spectrum analyzers, watts.

unscrambled A signal that has not been scrambled. An unscrambled signal does not need a decoder to receive the signal correctly.

V

vertical interval test signal (VITS) A signal that may be included during the vertical blanking interval to permit in-service testing and adjustment of video transmission.

vestigial sideband Amplitude modulation in which the higher frequencies of the lower sideband are not transmitted. At lower baseband frequencies, the carrier envelope is the same as that for normal double-sideband AM.

video A term pertaining to the bandwidth and spectrum of the signal that results from television scanning and that is used to reproduce a picture. In spectrum analyzer operation, a term describing the output of a spectrum analyzer's envelope detector. The frequency range extends from 0 Hz to a frequency that is typically well beyond the widest resolution bandwidth available in the spectrum analyzer. However, the ultimate bandwidth of the video chain is determined by the setting of the video filter. Video is also a term describing the television signal composed of a visual and aural carriers.

video average The digital averaging of spectrum analyzer trace information. It is available only on spectrum analyzers with digital displays.

video bandwidth (1) The maximum rate at which dots of illumination are displayed on a screen. (2) The occupied bandwidth of a video signal. For NTSC, that bandwidth is 4.2 MHz.

visual signal level The peak voltage produced by the visual signal during the transmission of synchronizing pulses.

visual carrier The visual carrier is the portion of a television signal that contains the picture. A television signal contains both a visual and an aural carrier.

visual carrier frequency The frequency of the carrier that is modulated by the picture information, which is 1.25 MHz above the bottom end of a television channel.

W

waveform monitor A special-purpose oscilloscope which presents a graphic illustration of the video and sync signals, amplitude, and other information used to monitor and adjust baseband video signals.

white level The level of a visual carrier that corresponds to the maximum level of the white area for a picture signal.

windshield wiper effect Onset of overload in multichannel cable television systems caused by cross modulation; the horizontal sync pulses of one or more television channels are superimposed on the desired channel carrier. The visual effect of the interference resembles a diagonal bar wiping through the picture.