

(2) CEA-931-A, “Remote Control Command Pass-through Standard for Home Networking,” 2003, IBR approved for § 76.640. (CEA-931-A is available through the document history of “CTA-931” from the reseller in paragraph (e)(2) of this section.)

(d) The following materials are available from Society of Cable Telecommunications Engineers (SCTE), 140 Philips Road Exton, PA 19341-1318; phone: 800-542-5040; or online at http://www.scte.org/standards/Standards_Available.aspx.

(1) ANSI/SCTE 26 2001 (formerly DVS 194): “Home Digital Network Interface Specification with Copy Protection,” 2001, IBR approved for § 76.640.

(2) SCTE 28 2003 (formerly DVS 295): “Host-POD Interface Standard,” 2003, IBR approved for § 76.640.

(3) ANSI/SCTE 40 2016, “Digital Cable Network Interface Standard,” copyright 2016, IBR approved for §§ 76.605, 76.640.

(4) SCTE 41 2003 (formerly DVS 301): “POD Copy Protection System,” 2003, IBR approved for § 76.640.

(5) ANSI/SCTE 54 2003 (formerly DVS 241), “Digital Video Service Multiplex and Transport System Standard for Cable Television,” 2003, IBR approved for § 76.640.

(6) ANSI/SCTE 65 2002 (formerly DVS 234), “Service Information Delivered Out-of-Band for Digital Cable Television,” 2002, IBR approved for § 76.640.

(e) Some standards listed above are also available for purchase from the following sources:

(1) American National Standards Institute (ANSI), 25 West 43rd Street, 4th Floor, New York, NY 10036; phone: 212-642-4980; or online at <http://webstore.ansi.org/>.

(2) Global Engineering Documents (standards reseller), 15 Inverness Way East, Englewood, CO 80112; phone: 800-854-7179; or online at <http://global.ihs.com>.

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§ 76.605 Technical standards.

(a) The following requirements apply to the performance of a cable television system as measured at the input

to any terminal device with a matched impedance at the termination point or at the output of the modulating or processing equipment (generally the headend) of the cable television system or otherwise noted here or in ANSI/SCTE 40 2016. The requirements of paragraph (b) of this section are applicable to each NTSC or similar video downstream cable television channel in the system. Each cable system that uses QAM modulation to transport video programming shall adhere to ANSI/SCTE 40 2016 (incorporated by reference, see § 76.602). Cable television systems utilizing other technologies to distribute programming must respond to consumer complaints under paragraph (d) of this section.

(b) For each NTSC or similar video downstream cable television channel in the system:

(1) The cable television channels delivered to the subscriber’s terminal shall be capable of being received and displayed by TV broadcast receivers used for off-the-air reception of TV broadcast signals, as authorized under part 73 of this chapter; and cable television systems shall transmit signals to subscriber premises equipment on frequencies in accordance with the channel allocation plan set forth in CTA-542-D (incorporated by reference, see § 76.602).

(2) The aural center frequency of the aural carrier must be 4.5 MHz \pm 5 kHz above the frequency of the visual carrier at the output of the modulating or processing equipment of a cable television system, and at the subscriber terminal.

(3) The visual signal level, across a terminating impedance which correctly matches the internal impedance of the cable system as viewed from the subscriber terminal, shall not be less than 1 millivolt across an internal impedance of 75 ohms (0 dBmV). Additionally, as measured at the end of a 30 meter (100 foot) cable drop that is connected to the subscriber tap, it shall not be less than 1.41 millivolts across an internal impedance of 75 ohms (+3 dBmV). (At other impedance values, the minimum visual signal level, as viewed from the subscriber terminal, shall be the square root of 0.0133 (Z) millivolts and, as measured at the end

of a 30 meter (100 foot) cable drop that is connected to the subscriber tap, shall be 2 times the square root of $0.00662(Z)$ millivolts, where Z is the appropriate impedance value.)

(4) The visual signal level on each channel, as measured at the end of a 30 meter cable drop that is connected to the subscriber tap, shall not vary more than 8 decibels within any six-month interval, which must include four tests performed in six-hour increments during a 24-hour period in July or August and during a 24-hour period in January or February, and shall be maintained within:

(i) 3 decibels (dB) of the visual signal level of any visual carrier within a 6 MHz nominal frequency separation;

(ii) 10 dB of the visual signal level on any other channel on a cable television system of up to 300 MHz of cable distribution system upper frequency limit, with a 1 dB increase for each additional 100 MHz of cable distribution system upper frequency limit (e.g., 11 dB for a system at 301–400 MHz; 12 dB for a system at 401–500 MHz, etc.); and

(iii) A maximum level such that signal degradation due to overload in the subscriber's receiver or terminal does not occur.

(5) The rms voltage of the aural signal shall be maintained between 10 and 17 decibels below the associated visual signal level. This requirement must be met both at the subscriber terminal and at the output of the modulating and processing equipment (generally the headend). For subscriber terminals that use equipment which modulate and remodulate the signal (e.g., baseband converters), the rms voltage of the aural signal shall be maintained between 6.5 and 17 decibels below the associated visual signal level at the subscriber terminal.

(6) The amplitude characteristic shall be within a range of ± 2 decibels from 0.75 MHz to 5.0 MHz above the lower boundary frequency of the cable television channel, referenced to the average of the highest and lowest amplitudes within these frequency boundaries. The amplitude characteristic shall be measured at the subscriber terminal.

(7) The ratio of RF visual signal level to system noise shall not be less than

43 decibels. For class I cable television channels, the requirements of this section are applicable only to:

(i) Each signal which is delivered by a cable television system to subscribers within the predicted Grade B or noise-limited service contour, as appropriate, for that signal;

(ii) Each signal which is first picked up within its predicted Grade B or noise-limited service contour, as appropriate;

(iii) Each signal that is first received by the cable television system by direct video feed from a TV broadcast station, a low power TV station, or a TV translator station.

(8) The ratio of visual signal level to the rms amplitude of any coherent disturbances such as intermodulation products, second and third order distortions or discrete-frequency interfering signals not operating on proper offset assignments shall be as follows:

(i) The ratio of visual signal level to coherent disturbances shall not be less than 51 decibels for noncoherent channel cable television systems, when measured with modulated carriers and time averaged; and

(ii) The ratio of visual signal level to coherent disturbances which are frequency-coincident with the visual carrier shall not be less than 47 decibels for coherent channel cable systems, when measured with modulated carriers and time averaged.

(9) The terminal isolation provided to each subscriber terminal:

(i) Shall not be less than 18 decibels. In lieu of periodic testing, the cable operator may use specifications provided by the manufacturer for the terminal isolation equipment to meet this standard; and

(ii) Shall be sufficient to prevent reflections caused by open-circuited or short-circuited subscriber terminals from producing visible picture impairments at any other subscriber terminal.

(10) The peak-to-peak variation in visual signal level caused by undesired low frequency disturbances (hum or repetitive transients) generated within the system, or by inadequate low frequency response, shall not exceed 3 percent of the visual signal level. Measurements made on a single channel

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using a single unmodulated carrier may be used to demonstrate compliance with this parameter at each test location.

(11) The following requirements apply to the performance of the cable television system as measured at the output of the modulating or processing equipment (generally the headend) of the system:

(i) The chrominance-luminance delay inequality (or chroma delay), which is the change in delay time of the chrominance component of the signal relative to the luminance component, shall be within 170 nanoseconds.

(ii) The differential gain for the color subcarrier of the television signal, which is measured as the difference in amplitude between the largest and smallest segments of the chrominance

signal (divided by the largest and expressed in percent), shall not exceed $\pm 20\%$.

(iii) The differential phase for the color subcarrier of the television signal which is measured as the largest phase difference in degrees between each segment of the chrominance signal and reference segment (the segment at the blanking level of 0 IRE), shall not exceed ± 10 degrees.

(c) As an exception to the general provision requiring measurements to be made at subscriber terminals, and without regard to the type of signals carried by the cable television system, signal leakage from a cable television system shall be measured in accordance with the procedures outlined in § 76.609(h) and shall be limited as shown in table 1 to paragraph (c):

TABLE 1 TO PARAGRAPH (c)

Frequencies	Signal leakage limit	Distance in meters (m)
Analog signals less than and including 54 MHz, and over 216 MHz	15 $\mu\text{V/m}$	30
Digital signals less than and including 54 MHz, and over 216 MHz	13.1 $\mu\text{V/m}$	30
Analog signals over 54 MHz up to and including 216 MHz	20 $\mu\text{V/m}$	3
Digital signals over 54 MHz up to and including 216 MHz	17.4 $\mu\text{V/m}$	3

(d) Cable television systems distributing signals by methods other than 6 MHz NTSC or similar analog channels or 6 MHz QAM or similar channels on conventional coaxial or hybrid fiber-coaxial cable systems and which, because of their basic design, cannot comply with one or more of the technical standards set forth in paragraphs (a) and (b) of this section, are permitted to operate without Commission approval, provided that the operators of those systems adhere to all other applicable Commission rules and respond to consumer and local franchising authorities regarding industry-standard technical operation as set forth in their local franchise agreements and consistent with § 76.1713.

NOTE 1: Local franchising authorities of systems serving fewer than 1,000 subscribers may adopt standards less stringent than those in § 76.605(a) and (b). Any such agreement shall be reduced to writing and be associated with the system's proof-of-performance records.

NOTE 2: For systems serving rural areas as defined in § 76.5, the system may negotiate

with its local franchising authority for standards less stringent than those in § 76.605(b)(3), (7), (8), (10) and (11). Any such agreement shall be reduced to writing and be associated with the system's proof-of-performance records.

NOTE 3: The requirements of this section shall not apply to devices subject to the TV interface device rules under part 15 of this chapter.

NOTE 4: Should subscriber complaints arise from a system failing to meet § 76.605(b)(10), the cable operator will be required to remedy the complaint and perform test measurements on § 76.605(b)(10) containing the full number of channels as indicated in § 76.601(b)(2) at the complaining subscriber's terminal. Further, should the problem be found to be system-wide, the Commission may order that the full number of channels as indicated in § 76.601(b)(2) be tested at all required locations for future proof-of-performance tests.

NOTE 5: No State or franchising authority may prohibit, condition, or restrict a cable system's use of any type of subscriber equipment or any transmission technology.

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