QWEST Communications International Inc. Technical Publication

QWEST Broadcast Video Service

77410
Issue A
March 2002

NOTICE

Technical Publication 77410, QWEST *Broadcast Video Service* provides information about Broadcast Video Service (TV-1). It furnishes sufficient technical detail to allow a customer to select one of the offered service interfaces to meet their requirements. For the Broadcast Video Service, QWEST will interface with the customer at the Network Interface (NI) with analog NTSC signals, and diplexed (zero, one or two) or non-diplexed (zero to four) audio channels. It is not the intent of this document to provide specific ordering information, but to describe the technical features of this service offering.

QWEST Communications International Inc reserves the right to revise this document for any reason, including but not limited to, conformity with standards promulgated by various governmental or regulatory agencies; utilization of advances in the state of the technical arts; or to reflect changes in the design of equipment, techniques, or procedures described or referred to herein.

Liability to anyone arising out of use or reliance upon any information set forth herein is expressly disclaimed, and no representation or warranties, expressed or implied, are made with respect to the accuracy or utility of any information set forth herein.

This document is not to be construed as a suggestion to any manufacturer to modify or change any of its products, nor does this publication represent any commitment by QWEST Communications International Inc. to purchase any specific products. Further, conformance to this publication does not constitute a guarantee of a given supplier's equipment and/or its associated documentation.

Future issues of Technical Publication 77410 will be announced to the industry at least 45 days before the issuance date. This notice, which will come through our standard customer notification channels, will allow the customer time to comment on the proposed revisions.

Ordering information for QWEST Publications can be obtained from the Reference Section of this document.

If further information is required, please contact:

QWEST
Manager - New Services Planning
700 W Mineral Ave., Room IA H12.21
Littleton, CO 80120
(303) 707-7873
Fax: (303) 707-9716
E-Mail: techpub@QWEST.com

Throughout this publication, the term QWEST signifies QWEST Communications International Inc.

COMMENTS on PUB 77410

PLEASE TEAR OUT AND SEND YOUR COMMENTS/SUGGESTIONS TO:

QWEST
Manager - New Services Planning
700 W Mineral Ave., Room IA H12.21
Littleton, CO 80120
(303) 707-7873
Fax: (303) 707-9716
E-Mail: techpub@QWEST.com

Information from you helps us to improve our Publications. Please take a few moments to answer the following questions and return to the above address.

Was this Publication valuable to you in understanding the technical parameters of our service?	YES _____ NO _____
Was the information accurate and up-to-date?	YES _____ NO _____
Was the information easily understood?	YES _____ NO _____
Were the contents logically sequenced?	YES _____ NO _____
Were the tables and figures understandable and helpful	YES _____ NO _____
Were the pages legible?	YES _____ NO _____

What format do you have? Paper ___ IBM Disk ___ Mac Disk ___

If you answered NO to any of the questions and/or if you have any other comments or suggestions, please explain:

_____

_____

_____

_____

(Attach additional sheet, if necessary)

Name _____ Date _____

Company_____

Address _____

_____

Telephone Number _____

E-Mail _____

CONTENTS

CONTENTS (Continued)

CONTENTS

Chapter and Section **Page**

1. Introduction

1.1 General

Technical Publication 77410, QWEST *Broadcast Video Service* provides information about Broadcast Video Service (TV-1). It furnishes sufficient technical detail to allow a customer to select one of the offered service interfaces to meet their requirements. For the Broadcast Video Service, QWEST will interface with the customer at the Network Interface (NI) with analog NTSC signals, and diplexed (zero, one or two) or non-diplexed (zero to four) audio channels. It is not the intent of this document to provide specific ordering information, but to describe the technical features of this service offering.

1.2 Reason for Reissue

This is a new publication. If it is reissued, the reason will be noted in this paragraph.

1.3 Scope

This publication presents the basic architecture to provide this service. It also contains the different options available for the Broadcast Video Service and the Network Channel (NC) and Network Channel Interface (NCI) codes to specify this service.

1.4 Document Organization

This publication is organized as follows;

Chapter 1 **Introduction** - provides the purpose and general information about this document

Chapter 2 **Overview of Broadcast Video Service** - describes the service and its architecture

Chapter 3 **Network Channel/Network Channel Interface Codes** - illustrates compatible NC and NCI code combination tables for ordering the services described in the chapter

Chapter 4 **Specifications of Broadcast Video Service** - provides specifications of the Broadcast Video Service

Chapter 5 **Maintenance** - provides customer and QWEST responsibilities in case of failure

Chapter 6 **Definitions –** presents definitions of terms and list of Acronyms

Chapter 7 **References** – refers to all the related documents and ordering procedures

CONTENTS

Chapter and Section **Page**

Figures

2 Overview of the Broadcast Video Service

2.1 Service Description

QWEST's Broadcast Video Service provides capability for one-way transmission of a standard 525-line/60 - field monochrome or System M-National Television Systems Committee (M-NTSC) color video signal.

Broadcast Video service is provided with zero to four audio channels. These channels can be diplexed or non-diplexed. Diplexed service has audio channels transported with the video stream at specified subcarrier frequencies. In case of the non-diplexed signals, the video and audio channels are provided separately at the Network Interface (NI).

The diplexed service has the options of zero, one or two audio channels. The bandwidth of diplexed signals is 30 Hz to 6.6 MHz. Non-diplexed service has the option of zero to four audio channels with the bandwidth of 30 Hz to 4.2 MHz.

Broadcast Video Service is point-to-point, unidirectional service that is provided between;

- two customer premises within the service providers area, or
- customer premises and Point of Termination (POT) of another carrier.

2.2 Network Architecture

QWEST will provide an electrical interface and physical connection as described in this publication. The transport facilities will be on fiber optics between the end-user or carrier premises and the serving QWEST Central Office. When there are interoffice facilities required for greater distances, fiber optics will be used as well.

The customer will interface with QWEST transport facilities at the NI. This interface depends on the type of service chosen by the customer e.g., diplexed or non-diplexed, and the number of audio channels. The video interface will always be analog NTSC channel at 4.2 MHz or 6.6 MHz for non-diplexed or diplexed respectively. Please refer to Chapter 3 for NC and NCI codes, and Chapter 4 for further information on physical and electrical characteristics of the signals at the NI.

Diplexed service will have single physical interface for audio and video channels. The customer will own the device to separate audio and video channels. The configuration for this type of service is shown in Fig 2.1.

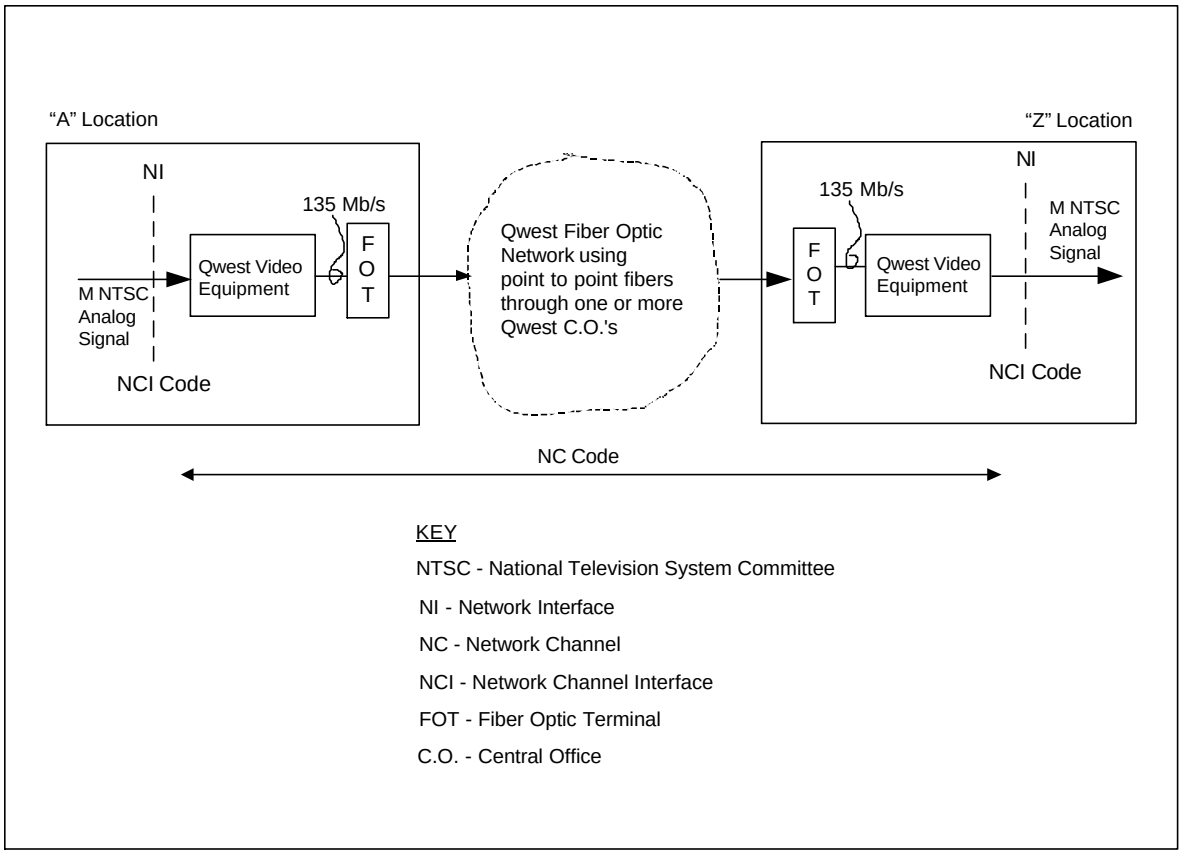

Figure 2-1 Configuration of Diplexed Broadcast Video Service

Non-diplexed service will have single physical interface for video channel and one to four audio channel interfaces depending on the NCI codes chosen by the customer. Configuration for this type of service is shown in Fig 2.2.

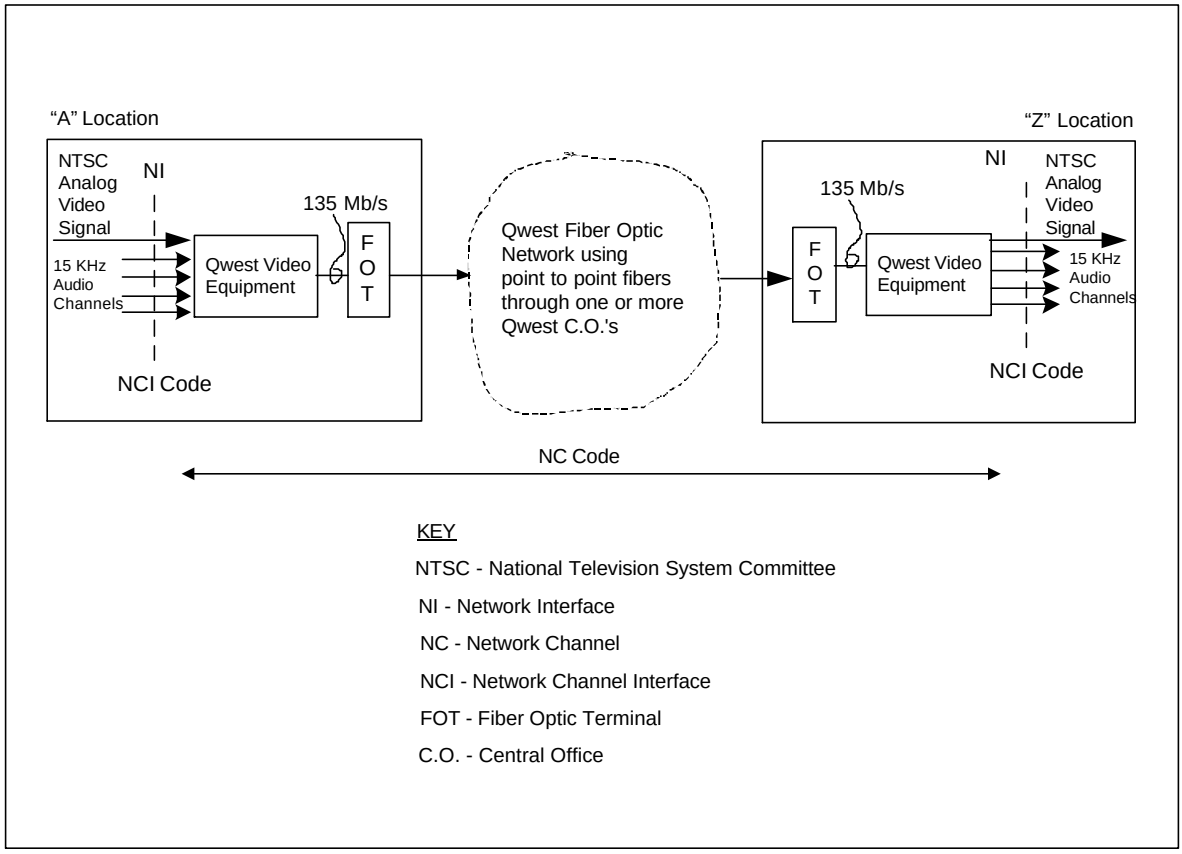

Figure 2-2 Configuration of non-diplexed Broadcast Video Service

2.3 Availability

Broadcast Video Service is tariffed in FCC No. 1. It is provided where facilities are available. At locations where facilities are not available, Special Construction, as set forth in Tariff FCC No. 2, may apply.

2.4 Applications

Applications for the Broadcast Video Service include but are not limited to full or part time broadcast or any other video application that may require this type of video and audio signals. This service provides a complete package with both video and audio transport.

CONTENTS

Chapter and Section **Page**

Figures

Tables

3. Network Channel/Network Channel Interface Codes

3.1 Network Channel (NC) Codes

3.1.1 General

Network Channel (NC) codes are a part of the Telcordia COMMON LANGUAGE® code set. The NC code is used to identify a channel used with the service. This section identifies the available channels and their NC codes.

3.1.2 Format

An NC code is a four-character code with two data elements:

- Channel Code
- Optional Feature Code

The format is illustrated in Figure 3-1.

Network Channel Code

Data Element	Channel Code		Optional Feature Code	
Character Position	1	2	3	4
Character Key	X	X	X or -	X or -

X = Alphanumeric
\- = Hyphen

Figure 3-1 Format Structure for NC Codes

The **Channel Code** (character positions 1 and 2) is a two-character alpha or alphanumeric code that describes the channel service in an abbreviated form. The channel code will frequently, but not always, be specified as the service code of the special service circuits or the transmission grade of the message trunk circuit. The NC channel code field is always filled.

The **Optional Feature Code** (character positions 3 and 4) is a two-character alpha or alphanumeric or hyphen code that represents the option codes available for each channel code. Varying combinations of this code will allow the customer to enhance the technical performance of the requested channel, or to further identify the type of service. It is also used to specify options such as conditioning, effective 4-wire, multiplexing, etc. The NC optional code field is always filled.

Further information about NC Codes may be found in ANSI T1.223-1997, *Information Interchange — Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System.*

3.2 Network Channel Interface (NCI) Codes

3.2.1 General

Network Channel Interface (NCI) codes are a part of the COMMON LANGUAGE® code set. The NCI code is used to identify a network interface of a service in our mechanized systems.

3.2.2 Format

An NCI code is a maximum twelve-character code that consists of five (5) data elements:

- Total Conductors
- Protocol
- Impedance
- Protocol Options
- Transmission Level Point(s) (TLP) - not required for this digital service.

The first three fields are required. The last two are optional. The format is illustrated in Figure 3-2.

Network Channel Interface Code

Total Conductors		Protocol		Impedance	Delimiter	Protocol Options			Delimiter	TLP Level	
										Transmit	Receive
1	2	3	4	5	6	7	8	9	10	11	12
N	N	A	A	X	•	X	X	X	•	X or -	X or -

A = Alpha
N = Numeric
X = Alphanumeric
• = Delimiter (normally a period)
- = Hyphen

Figure 3-2 Format Structure for NCI Codes

Total Conductors (character positions 1 and 2) is a two-character numeric code that represents the total number of physical conductors (e.g., wires or fibers) required at the interface.

Protocol (character position 3 and 4) is a two-character alpha code that defines requirements for the interface regarding signaling/transmission.

Impedance (character position 5) is a one-character alpha or numeric code representing the nominal reference impedance that will terminate the channel for the purpose of evaluating transmission performance. Values are listed in Table 3-1.

Table 3-1 NCI Impedance Values

Impedance in Ohms (Character Position 5)	
Data Value	**Code**
75	6

Protocol Options (character positions 7, 8, and 9) is a one to three-character alpha, numeric, or alphanumeric code that describes additional features (e.g., bit rate or bandwidth) on the Protocol to be used. It is an optional field that is always left justified.

3.3 Available NC Code for Broadcast Video Service

QWEST provides one NC code as an option on the Broadcast Video Service. This code is presented in Table 3-2.

Table 3-2 NC Code for Broadcast Video Service

NC Code	Description
TV- -	One-way transmission and the associated audio channel of 15 kHz, or better.

3.4 Available NCI Codes for Broadcast Video Service

There are three options to choose from in the case of diplexed Broadcast Video Services. The NCI codes for these options are given in Table 3-2.

Table 3-3 NCI Codes for Diplexed Broadcast Video Service

NCI Code	Description	Location
2TV6.0	Video Channel with no Audio	End User Access Provider Central Office
2TV6.1	Video Channel with one 15 kHz Audio	End User Access Provider Central Office
2TV6.2	Video Channel with two 15 kHz Audio	End User Access Provider Central Office

The NCI codes for non-diplexed Broadcast Video Service are given in Table 3-3.

Table 3-4 NCI Codes for Non-Diplexed Broadcast Video Service

NCI Code	Description	Location
04TV6.15A	One Video and One 15 kHz Audio Channel	End User Access Provider Central Office
06TV6.15A	One Video and Two 15 kHz Audio Channels	End User Access Provider Central Office
08TV6.15A	One Video and Three 15 kHz Audio Channels	End User Access Provider Central Office
10TV6.15A	One Video and Four 15 kHz Audio Channels	End User Access Provider Central Office

CONTENTS

Chapter and Section **Page**

Tables

4. Specifications

This chapter provides the physical and electrical specifications of the video and audio signals for QWEST's Broadcast Video Service. The video and audio signal characteristics are specified in the ANSI T1.502, SMPTE 170M, EIA/TIA-250-C and ANSI T1 505.

4.1 Composite Video and associated audio channels

The most widely used composite NTSC signals in the United States is created by multiplexing the color signals (Red, Green and Blue) to form the brightness signal known as Luminance (Y) signal. Mathematically, Y is defined as

$$Y = 0.30 \times R + 0.59 \times G + 0.11 \times B$$

Where R, G and B represent Red, Green and Blue colors respectively.

The weights associated with color signals depend on the sensitivity of human eye towards the color. The luminance signal is obtained to ensure that the color signals are compatible with the black and white television sets. It also assists in reducing the required bandwidth of the video signal.

The Broadcast Video Service provides the option of diplexed or non-diplexed 15kHz audio channels with one video channel. These options are discussed in Chapter 2 of this document.

Physical and electrical interface specifications for both video and audio channels for the Broadcast Video Service are given in the following sections of this document.

4.2 Physical Interface Specification

The physical interface for video is a 75-ohm unbalanced coaxial cable using a standard BNC (Bayonet) connector. This should be useable to handle the frequencies of up to 750 MHz. The coaxial connector shall meet the requirements listed in MIL-STD-39012. The physical interface for audio is a two-wire type 310, XLR or other suitable audio connector with a 600 ohms impedance characteristic. Customer should verify with QWEST before using a specific type of connector.

4.3 Electrical Interface Specifications

The customer shall provide a standard electrical input signal using the appropriate cable connection to the QWEST network equipment. The requirements for electrical interface for QWEST Broadcast Video Service are given in the following sections.

4.3.1 Video Signals

The electrical specifications for the Broadcast Video Service are given in table 4-1.

Table 4.1 Video Performance Specifications

Parameter	Specification
Signal-to-Weighted-Random-Noise Ratio	> 67 dB (10KHz to 4.2MHz)
Signal-to-Low-Frequency-Noise Ratio	> 53 dB (0 to 10KHz)
Signal-to-Periodic-Noise Ratio	> 67 dB (300Hz to 4.2MHz)
Frequency Response	
0.1 MHz	+0.7 to -0.7 IRE units
0.5 MHz	+0.7 to -0.7 IRE units
1.0 MHz	+0.9 to -0.9 IRE units
2.0 MHz	+1.0 to -1.0 IRE units
3.0 MHz	+1.2 to -1.1 IRE units
3.58 MHz	+0.6 to -0.6 IRE units
4.2 MHz	+1.2 to -1.1 IRE units
Chrominance to Luminance Gain Inequality	< ± 2 IRE units
Chrominance to Luminance Delay Inequality	< ± 20 ns
Line-Time Waveform Distortion	< 0.5 IRE unit peak-to-peak
Field-Time Waveform Distortion	< 3 IRE units peak-to-peak
Short Time Waveform Distortion	< 2.0 percent
Long-Time Waveform Distortion	< 8 IRE units peak, 3 second settling time
Insertion Gain	+5.9 to -5.5 IRE units
Insertion-Gain Variation	
Hourly	< ±1.7 IRE units
Over one second	< ±1.2 IRE units
Luminance Nonlinearity	< 2 IRE units
Differential Gain	< 2 IRE units or 2 percent
Differential Phase	< 0.7 degree
Chrominance to Luminance Intermodulation	< 1 IRE unit
Chrominance Non-Linear Gain	
20-IRE-unit chroma signal	< ±1 IRE unit
80-IRE-unit chroma signal	< ±1 IRE unit
Chrominance Non-Linear Phase	< 1.0 degree
Dynamic Gain of Picture Signal	< 2 IRE units
Dynamic Gain of Synchronizing Signal	< 1.2 IRE units

Transient Synchronizing Signal Nonlinearity	< 1.0 IRE units
Video Frame Jitter	≤ 7 ns
Availability of Video Service	> 99.99 percent

4.3.2 Audio Signals

As mentioned earlier, the QWEST Broadcast Video Service provides customers with the option of ordering 1 to 4 audio channels with one video channel. These audio channels can be diplexed or non-diplexed. Customer will provide the equipment to separate the audio and video channels incase diplexed service is ordered. Table 4.4 provides the electrical characteristics of the audio channels at 15 KHz.

Table 4.2 Audio Performance Specification – 15 KHz Service

Parameter	Specification
Signal to Idle Channel Noise Ratio	(50 Hz to 15 KHz)
Type A	> 66 dB, min
Total Harmonic Distortion	0.5 percent
Frequency Response (relative to reference level at 400 Hz)	
50 Hz to 100 Hz	+0.5 to -1.0 dB
100 Hz to 7.5 KHz	+0.5 to -0.5 dB
7.5 KHz to 15 KHz	+0.5 to -1.5 dB
Insertion Gain	0 dB ± 0.5 dB
Gain Difference Between Channels (relative to first channel)	
50 Hz to 100 Hz	< 1.0 dB
100 Hz to 7.5 KHz	< 0.5 dB
7.5 KHz to 15 KHz	< 1.0 dB
Phase Difference Between Channels (relative to first channel)	
50 Hz to 100 Hz	< 10 degrees
100 Hz to 7.5 KHz	< 3 degrees
7.5 KHz to 15 KHz	< 10 degrees
Crosstalk Coupling Between Channels *	< -56 dB (50 Hz to 15 KHz)
Audio-to-Video Time Differential Range	< 25 ms lead, 40 ms lag

CONTENTS

Chapter and Section **Page**

5. Maintenance

5.1 Customer Responsibilities

The customer is responsible for all equipment and cable on the customer side of the network interface in accordance with the procedures outlined in this document.

The customer or their agent must sectionalize the trouble and verify that the trouble is not in the customer owned equipment or cable before calling the QWEST Customer Service Center.

If the trouble is isolated to the customer owned equipment or cable, the customer is responsible for clearing the trouble and restoring the service to normal. QWEST will not be responsible for clocking or synchronization of any customer service applied to this interface.

5.2 QWEST Responsibilities

QWEST is responsible for all equipment and cable on its side of the network interface at the customer's location. The performance parameters for this service are based on the specifications for different types of the service as indicated in Chapter 4 of this document.

QWEST is responsible for maintaining the transmission facility between customer locations that may include an interoffice facility.

QWEST will furnish the customer a trouble reporting number and will initiate action to clear customer trouble within a period of twenty (20) minutes after receiving the trouble report.

QWEST is committed to a four (4) hour maximum service restoration time in the event of a service interruption due to an electronic component failure, with a two (2) hour objective. If the trouble is caused by a cable failure, the maximum restoration time is eight (8) hours.

CONTENTS

6. Definitions

6.1 Acronyms

ac	alternating current
AC	Access Customer
ANSI	American National Standards Institute
AP	Active Picture
BIT	Binary Digit
BNC	Bayonet Coaxial Connector, meeting Interface Dimensions for Coaxial-connectors in MIL-STD-3484A
bps	Bits Per Second (Now bit/s)
BSCL	Bell System Common Language®
BW	Bandwidth
CO	Central Office
COE	Central Office Equipment
CRC	Cyclic Redundancy Check
dB	Decibel
dBm	Decibel reference to one milliwatt
dc	Direct Current
EFS	Error Free Seconds
EIA	Electronic Industries Association
EU	End User
FOT	Fiber Optic Terminal
Gbit/s	Gigabit per Second
GHz	Gigahertz
IEC	Interexchange Carrier (or IC)
IEEE	Institute for Electrical and Electronic Engineers
IRE	Institute of Radio Engineers
kbit/s	kilobits per second (1,000 bit/s)
LATA	Local Access and Transport Area
Mbit/s	Megabit per Second
mV	Millivolt
NC	Network Channel
NCI	Network Channel Interface
NI	Network Interface

NRZI	Non-Return to Zero Inverted
ns	Nanosecond
NTSC	National Television Systems Committee
POP	Point of Presence
ps	Picosecond
SDI	Serial Digital Interface
SMPTE	Society of Motion Picture and Television Engineers
TIA	Telecommunications Industry Association
TLP	Transmission Level Point
TOC	Table of Contents
UI	Unit Interval

6.2 Glossary

Access Customers

Any of the companies that provide telecommunications service between LATAs and/or order from the Access Tariffs. Includes Interexchange Carriers.

Acronym

A word formed from the first (or first few) letters of a series of words.

Active Picture (AP)

This is the live video area of a composite NTSC signal that is framed in the first field between horizontal lines 21 and 262 and in the second field between horizontal lines 284 and 525. For component NTSC video, the active picture is the region bounded by the start of active video and end of active video and by the vertical blanking area.

American National Standards Institute (ANSI)

An organization supported by the telecommunications industry to establish performance and interface standards.

Amplitude Response vs Frequency

The amplitude response of a channel over the bandwidth provided. It is often called frequency response, and commonly is referred to as a single frequency within the passband.

Availability

The relative amount of time that a service is "usable" by a customer, represented as a percentage over a consecutive 12 month period.

Bandwidth

The range of frequencies that contain most of the energy or power of a signal; also, the range of frequencies over which a circuit of system is designed to operate.

Bit (Binary Digit)

A binary unit of information. It is represented by one of two possible conditions, such as the value 0 or 1, on or off, high potential or low potential, conducting or not conducting, magnetized or demagnetized. A Bit is the smallest unit of information, by definition.

Bits/second (bit/s)

Bits per second, e.g., 1200 bit/s. In data transmission, it is the number of binary zero and one bits transmitted in 1 second. Modern terminology uses "bit/s" e.g., 1200 bit/s.

Carrier

An organization whose function is to provide telecommunications services. Examples are: Local Exchange Carriers, Interexchange Carriers, Cellular Carriers, etc.

Central Office

A local switching system (or a portion thereof) and its associated equipment located at a wire center.

Channel

An electrical or photonic, in the case of fiber optic based transmission systems, communications path between two or more points of termination.

CODEC

Equipment that converts an analog signal into a digital signal (binary format) and which may compress the information content so that less bandwidth is required for transmission compared to the original signal format. Conversely, the decoder part converts the digital signal back into an analog signal and may provide for expansion of the signal.

Customer Premises

Denotes a building or portion(s) of a building occupied by a single customer or End-User either as a place of business or residence. Adjacent buildings and the buildings on the same continuous property occupied by the customer and not separated by a public thoroughfare are also considered the same customer's premises.

Customer Provided Equipment (CPE)

Equipment owned and maintained by the customer and located on their side of the End-User Point of Termination (EU-POT) network interface.

Customers

Denotes any individual, partnership or corporation who subscribes to the services provided by U S WEST. Customers are divided into two distinct and separate categories: (1) carriers, who provide services for hire for others, and (2) End-Users, who request services only for their own use.

Cyclic Redundancy Check (CRC)

A method of checking the integrity of received data, where the check uses a polynomial algorithm based on the content of the data.

End-User (EU)

The term "end-user" denotes any customer of telecommunications service that is not a carrier, except that a carrier shall be deemed to be an "end-user" to the extent that such carrier uses a telecommunications service for administrative purposes without making such service available to others, directly or indirectly. The term is frequently used to denote the difference between a Carrier interface and an interface subject to unique regulatory requirements at non-Carrier customer premises (FCC Part 68, etc.).

Error Free Second (EFS)

A one-second interval which does not contain any bit-errors. Usually expressed as a percent over a consecutive 24-hour period. Note - A period of no signal shall be considered a period of errored bits.

D1

Digital video recording standard format, on 19 mm magnetic tape, for video component signals, according to the specifications of ITU-R BT.601/656. The term D1 is commonly used by the television industry to indicate component digital video, although its use is incorrect.

dBm

A decibel in which the reference power is one milliwatt. Decibel reference to one milliwatt.

Decibel (dB)

A unit measurement of transmission loss, gain, or relative level. It is the logarithmic unit of signal power ratio most commonly used in telephony. It is used to express the relationship between two signal powers, usually between two acoustical, electrical, or optical signals; it is equal to ten times the common logarithm of the ratio of the two signal powers.

Demarcation Point

See Network Interface

End-User (EU)

The term "End-User" denotes any customer of telecommunications service that is not a carrier, except that a carrier shall be deemed to be an "End-User" to the extent that such carrier uses a telecommunications service for administrative purposes without making such service available to others, directly or indirectly. The term is frequently used to denote the difference between a Carrier interface and an interface subject to unique regulatory requirements at non-Carrier customer premises (FCC Part 68, etc.).

Fiber Optic Terminal (FOT)

The terminating or originating portion of a fiber optic system that performs both an electrical to optical conversion and a multiplexing function.

Gigabit per Second (Gbit/s)

One billion (1,000,000,000) bits per second.

Impedance

The total opposition offered by an electric circuit to the flow of an alternating current of a single frequency. It is a combination of resistance and reactance and is measured in ohms.

Interexchange Carrier (IC)/(IEC) or Interexchange Common Carrier

Any individual, partnership, association, joint-stock company, trust, governmental entity or corporation engaged for hire in interexchange, interstate or foreign communication by wire or radio.

Interface Code

See Network Channel Interface

IRE Unit

A unit equal to 1/140 of the peak-to-peak amplitude of the video signal, which is typically one volt. IRE is an acronym for Institute of Radio Engineers, the organization that defined the unit.

Jitter

Random timing distortions of a digital signal, whereby the appearance of a pulse differs from where the pulse should occur relative to time.

Kilobit/Second (kbit/s)

One thousand (1000) bits/second

Local Access and Transport Area (LATA)

A geographic area for the provision and administration of communications service. It encompasses designated exchanges that are grouped to serve common social, economic and other purposes.

Local Exchange Carrier (LEC)

Any company or corporation engaged for hire in providing Access and intraLATA communications services.

Megabit per Second (Mbit/s)

One million (1,000,000) bits per second.

Millivolt (mV)

One thousandth of one volt.

Nanosecond (ns)

One billionth of one second.

National Television Systems Committee (NTSC) Signal

The standard North American television transmission signal format intended for the transmission of 525 line/60 field color or monochrome video and associated audio signals.

Network

The interconnected telecommunications equipment and facilities.

Network Channel (NC) Code

The Network Channel (NC) code is an encoded representation used to identify both switched and non-switched channel services. Included in this code set are customer options associated with individual channel services, or feature groups and other switched services.

Network Channel Interface (NCI) Code

The Network Channel Interface (NCI) code is an encoded representation used to identify five (5) interface elements located at a Point of Termination (POT) at a central office or at the Network Interface at a customer location. The Interface code elements are: Total Conductors, Protocol, Impedances, Protocol Options, and Transmission Level Points (TLP). (At a digital interface, the TLP element of the NCI code is not used.)

Network Interface (NI)

The point of demarcation on the customer's premises at which U S WEST's responsibility for the provision of service ends.

Ohm

The unit of electric resistance.

Picosecond (ps)

One trillionth of one second

Point-to-Point

A circuit connecting two (and only two) points.

Premises

Denotes a building or portion(s) of a building occupied by a single customer or End-User either as a place of business or residence.

Protocol

The rules for communication system operation which must be followed if communication is to be effected; the complete interaction of all possible series of messages across an interface. Protocols may govern portions of a network, types of service, or administrative procedures.

Protocol Code

The Protocol (character positions 3 and 4 or the Network Channel Interface [NCI] Code) is a two-character alpha code that defines requirements for the interface regarding signaling and transmission.

Return Loss

Denotes a measure of the similarity between the two impedances at the junction of two transmission paths. The higher the return loss, the higher the similarity.

Route

The physical path established through a network for a particular circuit.,

Service Code (A COMMON LANGUAGE® code set)

A coded designation by which a particular Special Service Circuit may be identified. This designation must be unique, in a form that is readable and understandable, and be acceptable for both manual and mechanized procedures. [Special Service, as used by COMMON LANGUAGE®, may be called "Private Line", "Private Line Transport", "Switched Specials", "Dedicated Access", "Special Access", etc. in various tariffs and technical publications. Special Service is actually: COMMON LANGUAGE® Circuit Identification - Special Service, (abbreviated CLCI™ - S/S).]

Society of Motion Picture and Television Engineers (SMPTE)

An organization supported by the motion picture and television industry to establish television related performance and interface standards.

Transmission Level Point (TLP)

A point in a transmission system at which the ratio, usually expressed in decibels, of the power of a test signal at that point to the power of the test signal at a reference point, is specified. For example, a zero transmission level point (0 TLP) is an arbitrarily established point in a communication circuit to which all relative levels at other points in the circuit are referred.

Transmission Path

Denotes a path capable of transporting signals within the range of the service offering. A transmission path is comprised of physical or derived facilities consisting of any form or configuration of plant typically used in the telecommunications industry.

Wire Center

A building in which one or more central offices, used for the provision of local exchange services, are located.

CONTENTS

Chapter and Section **Page**

7. References

7.1 American National Standards Institute Documents

ANSI T1.502-1998	*System M-NTSC Television Signals - Network Interface Specifications and Performance Parameters*
ANSI T1.223-1997	*Information Interchange - Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Cods for the North American Telecommunications System*
ANSI/EIA-250-C	*Electrical Performance Standards for Television Transmission Systems,* February 1990

7.2 Telcordia Document

GR-338-CORE	*Television Special Access and Local Channel Services - Transmission Parameter Limits and Interface Combinations,* December 1995

7.3 SMPTE Document

SMPTE 170M-1999	*Television - Composite Analog Video Signal - NTSC for Studio Applications,* 1999

7.4 Ordering Information

All documents are subject to change and their citation in this document reflects the most current information available at the time of printing. Readers are advised to check status and availability of all documents.

Those who are not QWEST employees may order;

American National Standards Institute (ANSI) documents from:

American National Standards Institute
Attn: Customer Service
11 West 42nd Street
New York, NY 10036
Phone: (212) 642-4900
Fax: (212) 302-1286
Web: web.ansi.org/public/search.asp

ANSI has a catalog available which describes their publications.

Telcordia documents from:

Telcordia Customer Relations
8 Corporate Place, PYA 3A-184
Piscataway, NJ 08854-4156
Fax: (908) 336-2559
Phone: (800) 521-CORE (2673) (U.S. and Canada)
Phone: (908) 699-5800 (Others)
Web: www.telcordia.com

QWEST Technical Publications may be obtained from:
http://www.QWEST.com/techpub

SMPTE documents from:

http://www.smpte.org/smpte_store/standards/

Federal Communications Commission (FCC) documents may be obtained from:

Superintendent of Documents
Government Printing Office
Washington, D. C. 20402
Phone: 202 783-3238

7.5 Trademarks

COMMON LANGUAGE®	Registered Trademark of Telcordia.
QWEST®	Registered Trademark of QWEST, Inc.