U S WEST
Communications, Inc.
Technical Publication

U S WEST COMMERCIAL
VIDEO SERVICE
RADIO FREQUENCY
INTERFACE

77379
Issue B
July 1995

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1. Introduction

1.1 Purpose

This document describes U S WEST Commercial Video Service Radio Frequency (RF) Interface offered by U S WEST to its customers for Intrastate Non-Access Service. It covers distinguishing service features, technical specifications and defines valid interfaces.

1.2 Reason for Reissue

This technical publication is being reissued due to a change in the Network Channel code requirement. The new code is shown in section 3.2.

1.3 Scope

The intent of this document is to describe U S WEST Commercial Video Service RF Interface. Sufficient technical detail is furnished to describe the Network Interfaces and Network Channel option used to configure an end-to-end communications channel link. It is not the intent of this document to provide special ordering information, but to describe the technical features of this service offering.

Throughout the remainder of this publication, the term RF shall be used in place of the phrase Radio Frequency.

This RF Interface offering is a new option for the current Fiber Optic Commercial Video Service. It will not be used with any other Private Line Service.

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2. Description of Service

2.1 Applicability of Technical Specifications

The technical specifications presented in this document are applicable to U S WEST Commercial Video Service RF Interface only for Intrastate Non-Access Service. It does not attempt to describe the transmission equipment used to provide this interface.

2.2 General

U S WEST Commercial Video Service RF Interface provides a 10 MHz RF channel for a customer to use with a computer modem or similar communications device between customer locations. The interface is a new option for the current U S WEST Fiber Optic Commercial Video Service (CVS) described in the U S WEST Technical Publication 77326 "U S WEST Fiber Optic Commercial Video Services."

2.2.1 Transmission Equipment and Facilities Configuration

U S WEST will provide an interface comprised of an electrical and physical channel connection as described in this publication. This Commercial Video Service RF Interface will typically be deployed as shown in Figure 2-1 on page 2-3, where a point-to-point, one-way video system is portrayed. The interface allows the customer to access the allotted RF channel via a Bandpass (BP) filter. Two-way service requires two one-way Commercial Video Service (CVS) channels.

There are two options available to the customer, as shown in Table 2-1, depending on the manufacturer's equipment currently deployed for the particular customer application. These interfaces are essentially the same except for the bandpass frequency at which each must function due to the different frequency multiplexing schemes used by each manufacturer. The customer may use communications equipment such as a modem which is frequency agile or selectable of the appropriate frequency band.

Table 2-1 Commercial Video Service RF Interface Specifications

Option A - RF Interface Specifications:

	INPUT	OUTPUT
Impedance	75 ohms	75 ohms
Connector	BNC jack	BNC jack
Bandpass frequency*	25 MHz-35 MHz	25 MHz-35 MHz
RF Signal Levels	-10 dBm (+/-1 dB)	-50 dBm (+/-4 dB)

*All signals outside bandpass will be attenuated a minimum of 40 dB

Option B - RF Interface Specifications:

	INPUT	OUTPUT
Impedance	75 ohms	75 ohms
Connector	BNC jack	BNC jack
Bandpass frequency*	95 MHz-105 MHz	95 MHz-105 MHz
RF Signal Levels	-10 dBm (+/-1 dB)	-50 dBm (+/-4 dB)

*All signals outside bandpass will be attenuated a minimum of 40 dB

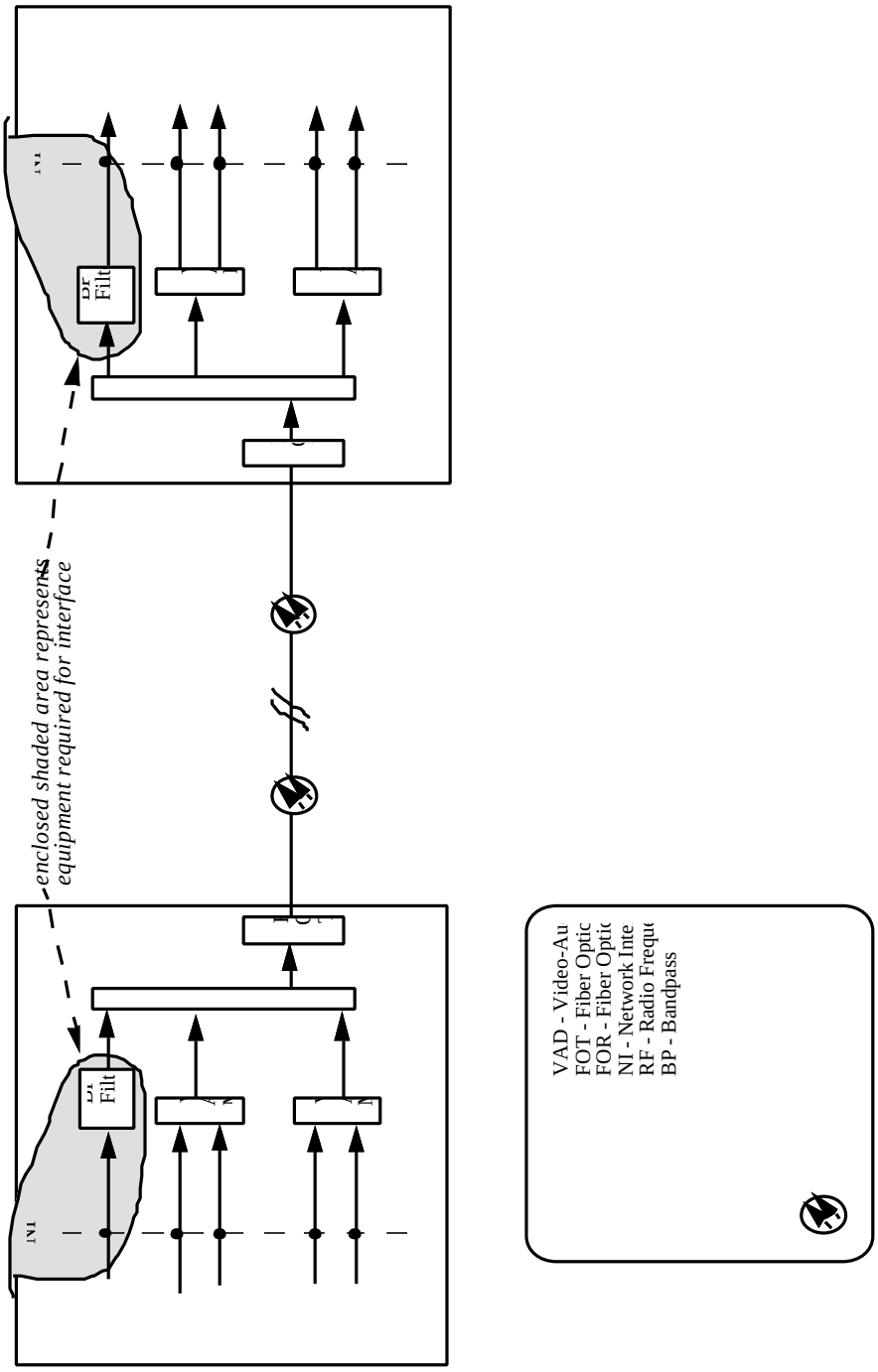

Figure 2-1 Commercial Video Service RF Interface

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3. Channel and Interface Specifications

3.1 General

This chapter provides information about the Network Channel (NC) and the Network Channel Interface (NCI) used with U S WEST Commercial Video Service RF Interface. The description makes use of a typical configuration of Figure 2-1 which should help with the understanding of what must be ordered to obtain the Commercial Video Service RF Interface.

3.2 Network Channel (NC) Codes

The Commercial Video Service RF Interface is defined by the NC and NCI codes. The NC code defines the channel while the NCI code defines the interface at the ends of the channel. A brief explanation of the format of these codes is provided in the following sections. For a more detailed view of coding parameters, refer to the American National Standards Institute (ANSI) document T1.223-1991, "Telecommunications - Information Interchange - Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System."

The NC code consists of four character positions as shown in Table 3-1. The first two characters, TZ (positions 1 and 2), of the NC code specify the type and quality of the channel. Character positions 3 and 4 represent the option codes available for a particular NC code. For Commercial Video Service RF Interface, the options use the characters A and D. The complete NC Code is TZAD for this service.

Table 3-1 U S WEST Commercial Video Service RF Interface NC Code for Non-Access Service

NC Code (TZAD)			
Position			Description
1 & 2	3	4	
TZ	A		A circuit for video and optional audio, allowing for the use of fiber optic facilities by U S WEST. Commercial Quality (Note: Meets NTSC "End-to-End" Video/Audio Signal Performance per ANSI T1.502-1988)
		D	Data Channel (Note: The data channel is not subject to ANSI T1.502-1988)

.

3.3 Network Channel Interface (NCI) Code

The electrical interface with the U S WEST network is described by an NCI code for each end of the service. The interface codes for the service must be specified by the customer when ordering the Commercial Video Service RF Interface.

The NCI code identifies five interface elements located at the Network Interface (NI). The interface elements are: (1) The number of conductors, (2) protocol, (3) impedance, (4) protocol option, and (5) Transmission Level Point (TLP). For the Commercial Video Service RF Interface, an example code is **02WV6.M1.O-** which contains the following elements:

- Element **02** represents the number of conductors (2) for the radio frequency band.
- Element **WV** represents the protocol for video interface (RF spectrum).
- Element **6** represents the impedance (75 ohms) and is followed by a delimiter (.).
- Element **M** represents the protocol option for a 10 MHz bandwidth which has two other options to describe the selected radio frequency band:
  - Element **1** represents a 25 MHz to 35 MHz passband (referred to as Option A in Table 2-1) and is followed by a delimiter (.).
  - Element **2** represents a 95 MHz to 105 MHz passband (referred to as Option B in Table 2-1) and is followed by a delimiter (.).
- Element **O-** occupies the TLP position, which for this application represents the *direction of service* as noted by one assigned alpha character (the letter "O"). Also, there is a hyphen indicating that *RF signal level is specified* by U S WEST at both the transmit and receive ends. The following statements indicate how the elements for direction of service and RF signal level should be used:
  - O- RF signal is transmitted from one customer location to U S WEST with an RF signal level of -10 dBm (± 1 dB).
  - -O RF signal is received at another customer location from U S WEST with an RF signal level of -50 dBm (± 4 dB).

The NCI code combinations for the Commercial Video Service RF Interfaces are listed in Table 3-2.

Table 3-2 U S WEST Commercial Video Service RF Interface NCI Code for Non-Access Service

Video Interface (RF Spectrum)	NC Code	End-User (EU) Transmit NCI Code	End-User (EU) Receive NCI Code
WV	TZAD	02WV6.M1.O- 02WV6.M2.O-	02WV6.M1.-O 02WV6.M2.-O

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4. Description of Signal

4.1 General

This chapter provides information about the electrical and physical interface specifications required for provision of U S WEST Commercial Video Service RF Interface. This will guide the customer in determining how to configure its signal hand-off at each end of the Commercial Video Service RF Interface circuit. In addition there are interface illustrations which combine all pertinent interface information into one section.

4.2 Electrical Interface Specifications

4.2.1 Impedance

The impedance presented by the respective input and output terminals of the RF interface shall have a standard value of 75 ohms, unbalanced-to-ground.

4.2.2 Commercial Video Service RF Interface Specifications

There are two options available to the customer depending on the manufacturer's equipment deployed for the particular customer application. These interfaces are the same except for the bandpass frequency at which each must function due to the different frequency multiplexing schemes employed by each manufacturer. The customer may use communications equipment such as a modem which is frequency agile or selectable of the appropriate frequency band.

Option A - RF Interface Specifications:

	INPUT	OUTPUT	
Bandpass frequency*	25 MHz-35 MHz	25 MHz-35 MHz	(10 MHz Band)
RF Signal Levels	-10 dBm (+/-1 dB)	-50 dBm (+/-4 dB)	

*All signals outside bandpass will be attenuated a minimum of 40 dB

Option B - RF Interface Specifications:

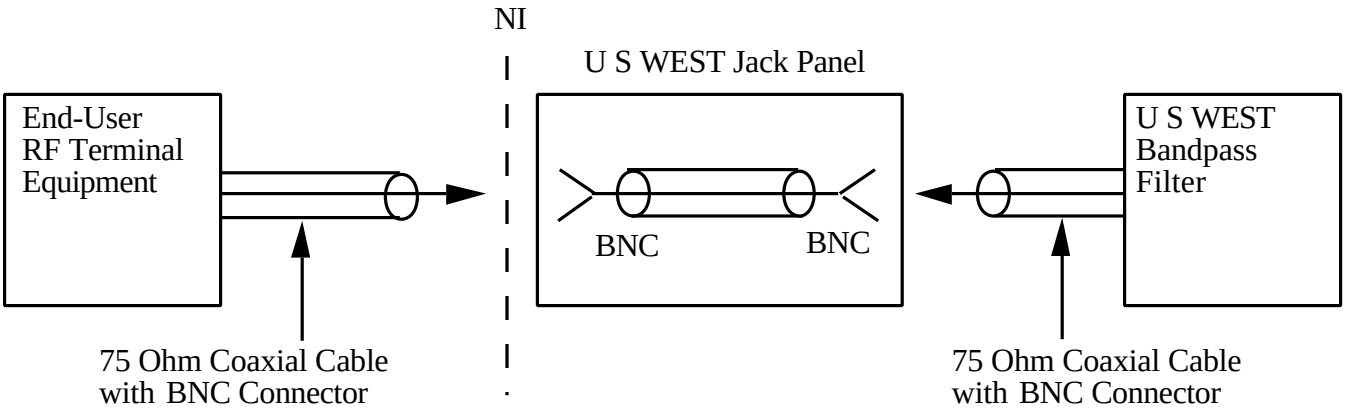
	INPUT	OUTPUT	
Bandpass frequency*	95 MHz-105 MHz	95 MHz-105 MHz	(10 MHz Band)
RF Signal Levels	-10 dBm (+/-1 dB)	-50 dBm (+/-4 dB)	

*All signals outside bandpass will be attenuated a minimum of 40 dB

4.3 Physical Environment Specifications

4.3.1 Connectors

Connection of the Commercial Video Service RF Interface at the Network Interface (NI) to an End-User (EU) shall be with a coaxial cable and a Bayonet Quick Connect (BNC) coax connector as shown in Figure 4-1. For a more detailed description of BNC connectors, refer to the Department of Defense Military Specification, MIL-C-39012C, "General Specification for Radio Frequency Coaxial Connectors."



BNC - Bayonet Quick Connect Coax Connector
NI - Network Interface
RF - Radio Frequency

Figure 4-1 Network Interface Connection

4.3.2 Environmental

The environmental conditions on the customer premises, such as ambient temperature and humidity, shall conform to the parameters specified in Technical Publication 77326, (see Section 8.2). There are no additional requirements for the Commercial Video Service RF Interface that would not already be provided for the Fiber Optic Commercial Video Service.

4.3.3 Power

There are no power requirements for the Commercial Video Service RF Interface as the bandpass filter is a passive device that is not powered.

4.4 Interface Illustrations

This section illustrates the RF interface used for an RF analog signal applicable for U S WEST Commercial Video Service RF Interface. Included is a summary of the technical information applicable for this interface.

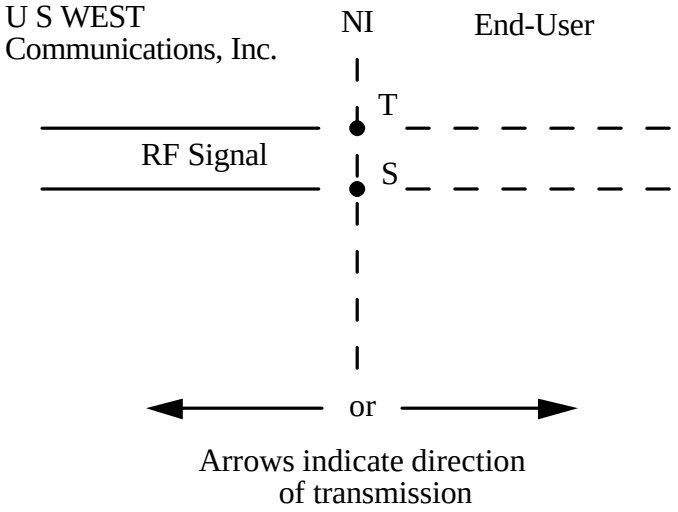
4.4.1 Interface Type 02WV6.M1

Application:	Commercial Video Service RF Interface
Operating mode:	Full-time RF analog signal
Physical description:	Coaxial cable with BNC connectors
Service:	Existing TV3 Commercial Video Service

Electrical Features

Impedance:	75 ohms unbalanced
Overload point (input):	-9 dBm
Operating level (nominal input):	-10 dBm
Frequency range:	25 MHz to 35 MHz

Illustration:



LEGEND

NI - Network Interface
RF - Radio Frequency
T - Tip
S - Shield

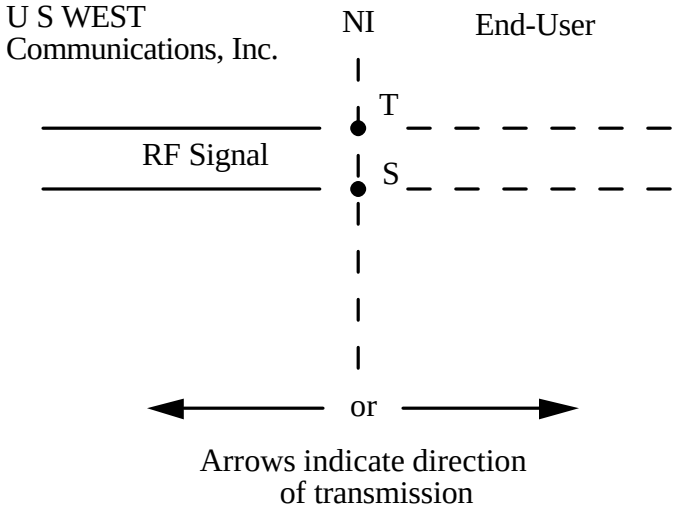
4.4.2 Interface Type 02WV6.M2

Application:	Commercial Video Service RF Interface
Operating mode:	Full-time RF analog signal
Physical description:	Coaxial cable with BNC connectors
Service:	Existing TV3 Commercial Video Service

Electrical Features

Impedance:	75 ohms unbalanced
Overload point (input):	-9 dBm
Operating level (nominal input):	-10 dBm
Frequency range:	95 MHz to 105 MHz

Illustration:



LEGEND

NI - Network Interface
RF - Radio Frequency
T - Tip
S - Shield

5. Performance Specifications

5.1 Performance

U S WEST will provide the appropriate equipment required to meet the customer's needs of Commercial Video Service RF Interface as prescribed in this publication for Non-Access Services. No performance specifications are defined for the RF channel provided between the RF Interfaces other than baseband video performance as shown in U S WEST Technical Publication 77326 (see Section 8.2).

U S WEST will not be responsible for clocking or synchronization of any customer service applied to this interface.

5.2 Availability

The availability of the Commercial Video Service RF Interface and channel is the portion of time that the channel is capable of performing its function. Availability is deemed interrupted for any of the following reasons:

- Continuity of the RF channel is interrupted.
- RF channel quality is deemed unusable due to transmission service channel impairment of the Commercial Video Service.

6. Maintenance

6.1 Customer Responsibilities

The customer is responsible for all equipment and cable on the customer side of the network interface at their location in accordance with the procedures outlined in U S WEST Technical Publication 77326 (see Section 8.2).

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 U S WEST 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. U S WEST will not be responsible for clocking or synchronization of any customer service applied to this interface.

6.2 U S WEST Responsibilities

U S WEST is responsible for all equipment and cable on the U S WEST side of the network interface at the customer location.

U S WEST is responsible for maintaining the transmission facility between customer locations which may include an interoffice facility.

U S WEST will furnish the customer a trouble reporting number and will initiate action to clear customer trouble within a time period of twenty minutes after receiving the trouble report.

U S WEST is committed to a four hour maximum service restoral time in the event of a service interruption due to an electronic component failure, with a two hour objective. If the trouble is caused by a cable failure, the maximum service restoral time is eight hours.

7. Definitions

7.1 Acronyms

ANSI	American National Standards Institute
BNC	Bayonet Quick Connect Coax Connector
BP	Bandpass
CVS	Commercial Video Service
EU	End-User
NC	Network Channel
NCI	Network Channel Interface
NI	Network Interface
RF	Radio Frequency
TLP	Transmission Level Point

7.2 Glossary

Carrier (CXR)

An organization whose function is to provide telecommunications services.

Central Office (CO)

A local switching system (or 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.

Decibel (dB)

The logarithmic unit of signal power ratio most commonly used in communications. It is used to express the relationship between two signal powers, usually between two acoustic, electrical, or optical signals; it is equal to ten times the common logarithm of the ratio of the two signal powers. For reference purposes, the output and input signal power is related to a specific level called a dBm, where zero dBm (Log 1 = 0) equals 1 milliwatt (mW) at a specified impedance.

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 (Federal Communications Commission Part 68, etc.).

Facilities

Facilities are the transmission paths between the demarcation points serving customer locations, a demarcation point serving a customer location and a U S WEST Central Office, or two U S WEST offices.

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 the 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 Network Interface at a customer location. The Interface code elements are: Total Conductors, Protocol, Impedance, Protocol Options, and Transmission Level points (TLP).

Network Interface (NI)

The point of demarcation on the End-User's premises at which the U S WEST Communications, Inc. responsibility for the provision of Access or Non-Access service ends.

Protocol Code

The Protocol (character positions 3 and 4 of the NCI Code) is a two-character alpha code that defines requirements for the interface regarding signaling and transmission.

Radio Frequency (RF)

This is a general term given to the transmission frequency spectrum in the range of 1 MHz to 1 GHz. Baseband services are multiplexed to these higher frequencies for more efficient utilization of the transmission media (coax, fiber, microwave, etc.) and then are demultiplexed back to baseband frequencies at the receiving end for reception.

8. References

8.1 American National Standards Institute Documents

ANSI T1.223-1991 *Telecommunications - Information InterExchange-Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System.*

8.2 U S WEST Technical Publications

77326 *U S WEST Fiber Optic Commercial Video Service* Issue D, December 1994

8.3 Department of Defense Military Specifications

MIL-C-39012C *General Specification for Radio Frequency Coaxial Connectors.*

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