U S WEST
Communications, Inc.
Technical Publication

COMMAND A LINK^{SM}
Technical Description And
Interface Combinations

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Interface Combinations

NOTICE

This document describes the COMMAND A LINK^{SM} product provided by U S WEST. COMMAND A LINK^{SM} is an option to several services provided by U S WEST. Customers may order these services and use the COMMAND A LINK^{SM} option to connect these services together and then rearrange the resulting network on a near-real-time basis.

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1.   Introduction

1.1   General

This document describes the COMMAND A LINK^{SM} product provided by U S WEST. COMMAND A LINK^{SM} is an option to several services provided by U S WEST. Customers may order these services and use the COMMAND A LINK^{SM} option to connect these services together and then rearrange the resulting network on a near-real-time basis.

1.2   Reason For Reissue

This publication is being revised to:

- Update the DDS Network Channel codes for 19.2 and 64 kbit/s (Chapters 3 and 4).

- Update the DDS Network Channel codes to allow customers to order channels without error correction (Chapters 3 and 4).

- Remove powering interface codes for DS1 End-User interfaces (Chapters 3 and 4).

- Correct the End-User NCI code for HCGC in Table 4-14.

- Replace Configurations 2h and 2k which were inadvertently deleted from Section 4.2 in Issue B.

- Change DS3 Network Channel codes to reflect national changes (Chapters 2 and 4).

- Remove Switched Multimegabit Data Service (Service is no longer offered).

- Add information about Collocated Interconnectors (Chapter 2).

1.3   Scope

This document describes the COMMAND A LINK^{SM} product and provides some cross-reference information concerning the several services to which COMMAND A LINK^{SM} is an option. Specific descriptions and technical parameters about these services are beyond the scope of this publication.

This document does not provide specific ordering information beyond the specific Network Channel and Network Channel Interface Code information included. These codes identify the technical parameters of the service.

1.4   Document Organization

This document is organized as listed in Table 1-1.

Table 1-1 Document Organization

C h a p t e r	C o n t e n t s
1	Introduction to this document
2	Description of the COMMAND A LINK^{SM} service. Includes a list of services available with COMMAND A LINK^{SM} and a description of the options.
3	A list of available Network Channel (NC) and Network Channel Interface (NCI) codes . Brief descriptions of some of the services available with COMMAND A LINK^{SM}.
4	NC and NCI code combinations. Some specific information is included about selected services.
5	A brief description of the COMMAND A LINK^{SM} Customer Controller.
6	Definitions.
7	References, document ordering instructions, and trademarks.

1.5   Using This Document

A customer should consult the referenced documents of other services to determine which services will meet their needs. Tables in this document include a list (by number) of these other publications. The Reference Section at the end of this document contains the full titles and ordering instructions for the publications.

The customer should work with their U S WEST representative to select services and to design a network to meet their needs. This document indicates which services can work together. However, the detailed information required to determine which options or parameters that might be required for these services is beyond the scope of this document.

1.6   Exchange Services

COMMAND A LINK^{SM} is available with certain non-designed exchange services. Since they are non-designed, no Network Channel or Network Channel Interface codes are used. Thus discussion of these services is beyond the scope of this publication. Local tariffs should be consulted for availability.

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Figures

Tables

2. Description of Service

2.1 General

COMMAND A LINK^{SM} is an option available with selected services offered by U S WEST which allows a customer to connect services together into a network and then rearrange the connections on a near-real-time basis.

The services are connected and rearranged by an Intelligent Network Element, usually a Digital Cross-connect System (DCS). This document assumes that the Intelligent Network Element will be a DCS unless otherwise stated.

The customer controls the DCS by means of a Customer Controller. Additional information about the controller and the customer access may be found in Chapter 5 of this document.

Figure 2-1 illustrates a typical service ordered with the COMMAND A LINK^{SM} option. Details of how the specific service is provided are omitted.
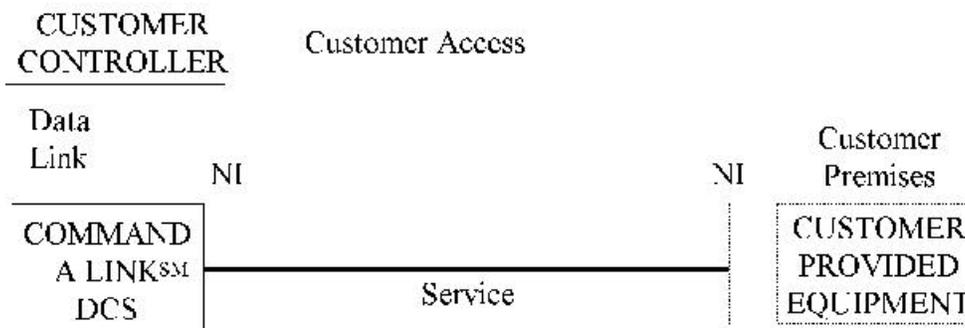
Figure 2-1 Typical COMMAND A LINK^{SM} Service

A typical customer network is illustrated in Figure 2-2. Three services are connected to a COMMAND A LINK^{SM} DCS. The three can be connected together in different combinations controlled by the customer via the customer controller.

The service connection to the COMMAND A LINK^{SM} DCS is by means of a COMMAND A LINK^{SM} port. There are three sizes of ports currently offered with COMMAND A LINK^{SM} : the DS3, the DS1, and the DS0 ports. The choice of which size to use would be based on the customer's circuit quantity and economics. These three ports are further described in Section 2.3. A one-size-fits-all port, the Virtual Port, is discussed in Section 2.3.4. The Virtual Port is used to connect channels between two customers (e.g., an End-User and an interexchange carrier).
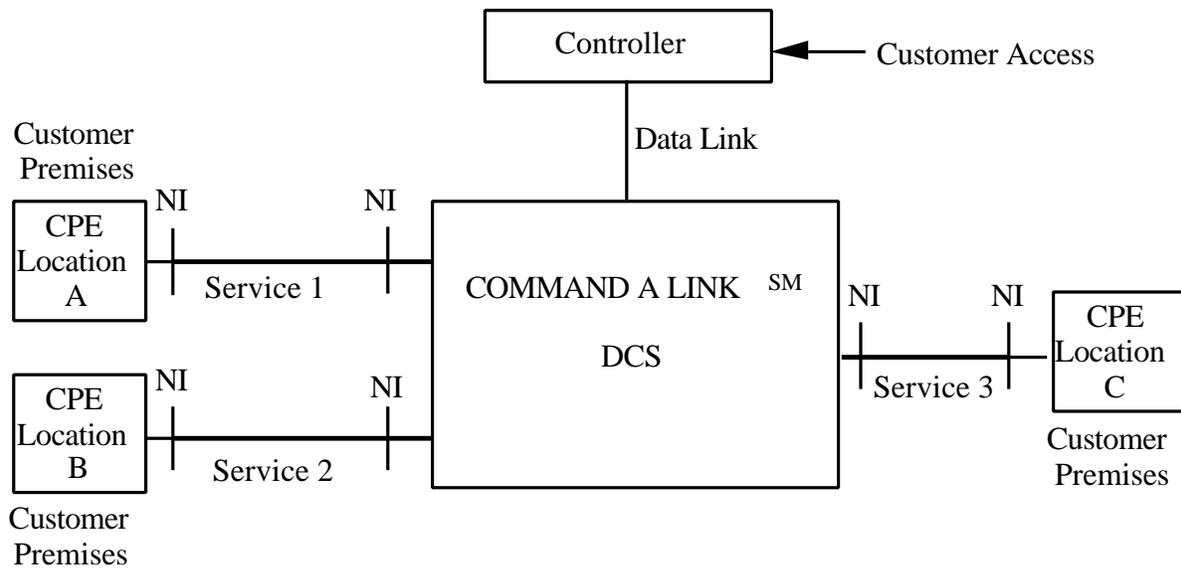
CPE = Customer Provided Equipment
DCS = Digital Cross-Connect System
NI   = Network Interface

Figure 2-2 Typical COMMAND A LINK^{SM} Network

The network design process includes the determination of services and options required to form a network including type, location, and quantity of both circuits and COMMAND A LINK^{SM} Ports.

The type of channel rearrangement options must also be determined. This subject is discussed in Section 2.4.

2.2   Service Availability

COMMAND A LINK^{SM} is available as an option to several services provided by U S WEST through the Federal Communications Commission Tariff Number Five (FCC #5) and through several state tariffs and catalogs. Certain features may not be available in all jurisdictions.

COMMAND A LINK^{SM} is available only in locations which have a DCS which is connected to the customer controller. Those wishing to have the service from other locations would order circuits between their location and the appropriate COMMAND A LINK^{SM} DCS location.

U S WEST utilizes several different types of DCSs made by several different vendors. Consequently, certain service capabilities may not be available at all DCS locations. The rearrangement options discussed in Section 2.4 are dependent on the type of DCS available at a location. U S WEST should be contacted to determine specific availability for any specific location and service.

The COMMAND A LINK^{SM} service option is currently available with the services listed in Tables 2-1 and 2-2. The technical description of these services may be found in the indicated references. Full titles and ordering information for these documents may be found in the Reference Section of this document. A U S WEST Publication normally is more specific to the U S WEST service offerings than a Bellcore Technical Reference.

The availability of specific options and interfaces for use with the COMMAND A LINK^{SM} option may be found in Chapters 3 and 4 of this document.

Table 2-1 Non-Access Services Available With COMMAND A LINK^{SM}

Service Type	Reference Source *	Service Name
Digital Data 31 (DD31)	PUB 77312, 77204	Digital Data Service
Fast Packet	PUB 77372	Frame Relay
High Capacity 3 (HC3)	PUB 77324	DS3 Service
High Capacity 31 (HC31)	PUB 77375, 77200	DS1 Service
Improved Reliability - DS1 or DS3 on Optical Transport	PUB 77340	Self-Healing Alternate Route Protection
Improved Reliability - Facility Routing	PUB 77344	Diversity and Avoidance
Premium High Capacity	PUB 77332	Self Healing Network Service
Voice and Data	PUB 77331	Simultaneous Voice and Data Service
Voice Grade 32 (VG32)	PUB 77311 PUB 77319	Analog Private Line Digital Switched Services
Voice Grade 33 (VG33)	PUB 77311 PUB 77319	Analog Private Line Digital Switched Services
Voice Grade 36 (VG36)	PUB 77311	Analog Private Line

* Full titles and ordering information for these documents may be found in the Reference
 Section at the end of this document.

Table 2-2 Access Services Available With COMMAND A LINK^{SM}

Service Type	Reference Source *	Service Name
Digital Access 1 (DA1) Digital Access 2 (DA2) Digital Access 3 (DA3) Digital Access 4 (DA4) Digital Access 5 (DA5) Digital Access 6 (DA6)	PUB 77312, 77204	Digital Data Service
Fast Packet	PUB 77372	Frame Relay
High Capacity 1 (HC1)	PUB 77200, 77375	DS1 Service
High Capacity 3 (HC3)	PUB 77324	DS3 Service
Improved Reliability - DS1 or DS3 on Optical Transport	PUB 77340	Self-Healing Alternate Route Protection
Improved Reliability - Facility Routing	PUB 77344	Diversity and Avoidance
Premium High Capacity	PUB 77332	Self Healing Network Service
Voice and Data	PUB 77331	Simultaneous Voice and Data Service
Voice Grade 1 (VG1) Voice Grade 2 (VG2) Voice Grade 3 (VG3) Voice Grade 4 (VG4) Voice Grade 5 (VG5) Voice Grade 6 (VG6) Voice Grade 7 (VG7) Voice Grade 8 (VG8) Voice Grade 9 (VG9) Voice Grade 10 (VG10)	PUB 77310	Analog Private Line

* Full titles and ordering information for these documents may be found in the Reference
 Section at the end of this document.

2.3   Port Types

There are several types of ports used to provide the COMMAND A LINK^{SM} service. The choice of which size to use would be based on the customer's circuit quantity and economics.

2.3.1 DS3 Port

The DS3 Port (or 44.736 Mbit/s Port) is a connection to the COMMAND A LINK^{SM} DCS at the DS3 44.736 Mbit/s digital signal level. The DS3 that is connected to this port is purchased from the U S WEST DS3 Service.

The DS3 may be channelized into 28 DS1 (1.544 Mbit/s) channels. The DS1 channels may be individually cross-connected to other ports or the entire DS3 may be treated as an intact unit.

The available interfaces for the DS3 port are discussed in Section 2.4. The interfaces use the Information codes of 04CS6.31R or 04CS6.33R as described in Chapter 3, Section 3.3.

2.3.2 DS1 Port

The DS1 Port (or 1.544 Mbit/s Port) is a connection to the COMMAND A LINK^{SM} DCS at the DS1 1.544 Mbit/s digital signal level. The DS1 that is connected to this port is purchased from the U S WEST DS1 Service.

The DS1 may be channelized into 24 DS0 (64 kbit/s) channels. The DS0 channels may be individually cross-connected to other ports or the entire DS1 may be treated as an intact unit.

The available interfaces for the DS1 port are discussed in Section 2.4. The interfaces use the Information codes 04CS9.10R, 04CS9.11R, or 04CS9.31R as described in Chapter 3, Section 3.3.

2.3.3 DS0 Port

The DS0 Port (or 64.0 kbit/s Port) is basically one-twenty fourth of a DS1 Port plus a single channel's portion of a central office multiplex. This multiplex, usually a D-Bank, is then equipped with the proper type of channel unit based on the service being connected to the port.

DS0 Ports may be cross-connected only as individual DS0 connections. The interface is discussed in Section 2.4. The only valid Information code is 04CS9.10R as described in Chapter 3, Section 3.3.

2.3.4 Virtual Port

Virtual ports are used to provide cross-connections between separate customer's networks appearing on the same DCS. This feature is useful in situations where two customers want to share information. A shared disaster recovery site is a typical application. The customers would connect a circuit to the recovery site via a virtual port.

A partition is set up in the customer controller between each customer's services when circuits are initially defined. Each customer has access to only one side of the virtual port.

The ports are implemented using software and are controlled by the COMMAND A LINK^{SM} Customer Controller. Virtual ports are available in all sizes. The virtual port may be thought of as being internal to the DCS and having no direct network interface. The virtual port is accessed only through standard DS3, DS1, or DS0 ports into the DCS.

2.4   Channel Rearrangement Options

2.4.1 Digital Cross-connect System Types

There are several generic types of Digital Cross-connect Systems (DCSs) used by U S WEST to provide the COMMAND A LINK^{SM} service. These DCSs may be generically classified by their functional capabilities relating to the digital hierarchy level (i.e., DS0, DS1, or DS3). These machines may be classified using terms such as 1/0, 1/1, 3/3, 3/1, and 1/0/S.

The typical 1/0 DCS has DS1 ports and can rearrange both the intact DS1 and the individual DS0 channels riding the DS1. A 1/0/S DCS is the same as the 1/0 machine except that it has some additional "subrate" capabilities commonly used to provide digital data services. A 1/1 DCS has DS1 ports and can only rearrange DS1s. An electronic DSX (EDSX) could be considered a 1/1 DCS.

The typical 3/1 DCS has both DS3 and DS1 ports and can rearrange both by intact DS3's and by the individual DS1s. The DS1s may be connected to the DS1 ports or may be part of a DS3. The 3/3 DCS has only DS3 ports and rearranges only by intact DS3's.

2.4.2 Customer Requirements

Several channel rearrangement options have been developed to identify the type of rearrangement required to meet the customer's requirements. A customer with a DS1 channel, for example, may or may not require the ability to rearrange the individual DS0s on the DS1 channel. Options for the DS1 interface describe this need and allow U S WEST to select the proper DCS to provide the proper reconfiguration capability. The Information codes that identify these interface options are listed in Table 2-3 and are further explained in Chapter 3.

2.4.3 Available Options

Table 2-3 is a summary of situations that may be encountered. The situations are defined by the first three columns. The remaining columns identify the generic DCS type(s) that may meet the particular requirements and list the Information codes and typical Network Channel (NC) codes.

Table 2-3 Channel Rearrangement Options

Criteria			Options		
Channel Size	Rearrangable By	Port Type	Generic DCS Type	Information Code	Typical** NC Code
DS0 (DDS)	DS0	DS0	1/0 *	04CS9.10R	XH-C
DS0 (Other)	DS0	DS0	1/0	04CS9.10R	LG--
DS1	DS0	DS1	1/0 *	04CS9.10R	HC-C
DS1	DS1	DS1	1/0	04CS9.10R	HC-C
DS1	DS1	DS1	1/1	04CS9.11R	HC-C
DS1	DS1	DS1	3/1	04CS9.31R	HC-C
DS3	DS1	DS3	3/1	04CS6.31R	HF--
DS3	DS3	DS3	3/1	04CS6.31R	HF--
DS3	DS3	DS3	3/3	04CS6.33R	HF--
DS3 ***	DS0	DS3 & DS1	3/1 & 1/0	04CS6.31R 04CS9.10R	HF-- & HC-C

*   A 1/0/S DCS is required if some DDS functions are needed.

** Chapter 3 contains additional NC and Information code information.

*** See Section 2.4.4.

A customer requiring a DS1 connection with the ability to rearrange by DS0s would order the HC-C channel with the 04CS9.10R Information code. Requirements for a DS1 with only DS1 rearrangement capability would be met by the HC-C NC code with the 04CS9.11R Information code. The latter could be provided by either a 1/0, a 1/1, or a 3/1 DCS.

2.4.4 DS3 Rearrangable By All Levels

U S WEST does not have available a DCS with DS3 ports with the capability of rearranging at the DS0 level (i.e., an 04CS6.30R connection). Therefore customers requiring DS0, DS1, and DS0 reconfigurability on a DS3 channel will have to buy appearances on two DCSs. A typical example is illustrated in Figure 2-3 below. Specific definitions of the Network Channel and Information codes may be found in Chapter 3.
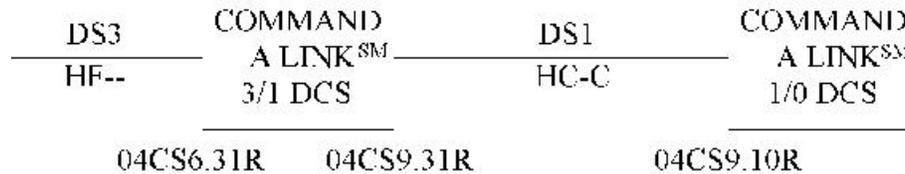
Figure 2-3 Special Two DCS Application

2.5　　Tariffs and Catalogs

Further information may be found in the appropriate tariff or catalog. These sources include ordering information.

Some services utilize Central Office Connecting Channels to COMMAND A LINK^{SM}.

2.6　　Collocated Interconnectors

Interconnectors collocated in U S WEST wire centers may not directly connect to a COMMAND A LINK^{SM} DCS. However, they may connect to services which in turn connect to COMMAND A LINK^{SM}. See PUB 77386, *Expanded Interconnection and Collocation for Private Line Transport and Switched Access Services,* for further information about Collocated Interconnectors.

CONTENTS

3.   Network Channels And Channel Interfaces

3.1   General

The COMMAND A LINK^{SM} service is available as an option to a number of other services. This involves a large number of channel types and network interfaces. These are identified by Network Channel (NC) and Network Channel Interface (NCI) codes respectively. A special Information code is used at the interface at the DCS. This Chapter discusses the types of channels and interfaces.

This document uses underlines (e.g. 04DS9.___) in representing NC or NCI codes to indicate that several values may apply in those character positions.

This Chapter contains lists of NC and NCI Codes with reference sources used with COMMAND A LINK^{SM} . The interface type represented by the 04CS_.__R Information Code is also defined.

The NC and NCI codes for some services represent the technical description and may not accurately reflect ordering information.

3.2   Network Channel Codes

The NC code is used to describe the channel being connected between the DCS and the customer's location. These channels are the services to which COMMAND A LINK^{SM} is an option.

The NC code is four characters long. The first two characters are known as the "Channel Code" and classify the basic service. The last two characters identify options to the basic service. The NC code XH-C, for example, identifies the channel as a 56 kbit/t DDS circuit with the "Customer Reconfigurable" option. Further information concerning the NC code format may be found in ANSI 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*.

Table 3-1 contains a list of the basic NC codes that may be encountered with COMMAND A LINK^{SM}. Underlines (_) are used to represent several different values. The table also includes a brief description of the service and a reference source where the reader may find additional information about the specific service. The basic rearrangement capabilities of the channels were discussed in Chapter 2.

Chapter 4 contains a complete list of NC codes with options applicable to COMMAND A LINK^{SM}.

3.3   Network Channel Interface (NCI) Codes

Network Channel Interface or NCI codes are used to identify the customer interface to the network and some interfaces located in the central office (CO). Several technical criteria are encoded in the NCI code. Reference sources are provided to further define the specific NCI codes.

Table 3-1 Applicable Network Channel Codes

N C Code*	Description	Reference Source[†]
	Analog Private Line Service	
LB__	VG1 - Access	PUB 77310
LC__	VG2 - Access	PUB 77310
LD__	VG3 - Access	PUB 77310
LE__	VG4 - Access	PUB 77310
LF__	VG5 - Access	PUB 77310
LG__	VG6 - Access	PUB 77310
LH__	VG7 - Access	PUB 77310
LJ__	VG8 - Access	PUB 77310
LK__	VG9 - Access	PUB 77310
LN__	VG10 - Access	PUB 77310
UC__	VG32 - Non-Access	PUB 77311
UCG_	Digital Switched Service	PUB 77319
UD__	VG33 - Non-Access	PUB 77311
UDG_	Digital Switched Service	PUB 77319
UG__	VG36 - Non-Access	PUB 77311
	Digital Data Service	
XA_C	2.4 kbit/s, Customer Reconfigurable	PUB 77312, 77204
XA_V	2.4 kbit/s, Customer Reconfigurable, With CO Bridging	PUB 77312, 77204
XB_C	4.8 kbit/s, Customer Reconfigurable	PUB 77312, 77204
XB_V	4.8 kbit/s, Customer Reconfigurable, With CO Bridging	PUB 77312, 77204
XC_C #	19.2 kbit/s, Customer Reconfigurable	PUB 77312, 77204
XC_V #	19.2 kbit/s, Customer Reconfigurable, With CO Bridging	PUB 77312, 77204
XG_C	9.6 kbit/s, Customer Reconfigurable	PUB 77312, 77204
XG_V	9.6 kbit/s, Customer Reconfigurable, With CO Bridging	PUB 77312, 77204
XH_C	56 kbit/s, Customer Reconfigurable	PUB 77312, 77204
XH_V	56 kbit/s, Customer Reconfigurable, With CO Bridging	PUB 77312, 77204
XD_C #	64 kbit/s, Customer Reconfigurable	PUB 77312, 77204

*   Several values may apply in the positions indicated by the underlines.

[†]   The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

\#   Formerly XE

Table 3-1 Applicable Network Channel Codes (Continued)

NC Code*	Description	Reference Source [†]
D S 1 S e r v i c e s		
HC_C	DS1 (1.544 Mbit/s), Customer reconfigurable	PUB 77375, 77200
HC_V	DS1 (1.544 Mbit/s), Customer reconfigurable, CO Multiplexing, DS1/Voice and Digital Data	PUB 77375, 77200
HCXE	Central Office Cross-connect, DS1 to DS1 intact, ANSI ESF, B8ZS	PUB 77200
D S 3 S e r v i c e		
HF--	One DS3 (44.736 Mbit/s) using M23 application	PUB 77324
HF-1	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for one DS1 Clear Channel at a time per slot using B8ZS line code.	PUB 77324
HF-4	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for four DS1 Clear Channels at a time per slot using B8ZS line code.	PUB 77324
HF-7	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for seven DS1 Clear Channels at a time per slot using B8ZS line code.	PUB 77324
HFX-	Central Office Cross-connection, DS3 to DS3	PUB 77324
F r a m e R e l a y		
XH-R	Fast Packet - Digital Data Service - 56 knit/s	PUB 77372
XD-R #	Fast Packet - Digital Data Service - 64 knit/s	PUB 77372
HCER	Fast Packet - DS1 Channel Service	PUB 77372
S e l f H e a l i n g N e t w o r k S e r v i c e		
HCPS	DS1 Channel, Premium Service, Self-Healing Network	PUB 77332
HFPS	DS3 Channel, Premium Service, Self-Healing Network	PUB 77332

*   Several values may apply in the positions indicated by the underlines.

[†]   The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Formerly XE-R

Table 3-1 Applicable Network Channel Codes (Continued)

N C Code*	Description	Reference Source [†]
	Self-Healing Alternate Route Protection (SHARP)	
HCH_	Self Healing & Disaster Recovery (SHARP) - DS1	PUB 77340
HFH_	Self Healing & Disaster Recovery (SHARP) - DS3	PUB 77340

* Several values may apply in the positions indicated by the underlines.

[†] The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

The format of the NCI code is: five characters, a period used as a delimiter, usually followed by additional characters used to define options. The first two of five positions are numeric and are used to indicate the number of conductors. The next two of five positions are alphabetic and indicate the type of interface. The fifth position is numeric and is used to indicate the impedance of the interface.

The NCI code 04DU5.56, for example, indicates that the interface has four wires (04), is a digital access interface (DU), and has an impedance of 135 ohms (5). The option positions (56) in this example indicate the rate of 56 kbit/s. The 04DU5.56 NCI code would be compatible with the previously mentioned XH-C NC code. The combination appears in the tables in Chapter 4.

The DS3 level NCI code that may be encountered with COMMAND A LINK[SM] is listed in Table 3-2. The list gives a brief description and reference sources for those readers requiring more information. Titles and ordering instructions for the references may be found in Chapter 7.

Table 3-2 DS3 Network Channel Interface Codes

N C I Codes	Description	Reference Source [†]
04DS6.44	One DS3 (44.736 Mbit/s) Using M23 Multiplex application.	PUB 77324, ANSI T1.107-1995

[†] The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-3 contains a list of DS1 level NCI codes and references.

Table 3-3 Customer Location DS1 Network Channel Interface Codes

NCI Code	Description	Reference Source [†]
	End-User Interfaces	
04DU9.BN	1.544 Mbit/s with AMI line code and superframe format but no line powering	ANSI T1.403-1995, PUB 77375
04DU9.BX	1.544 Mbit/s with AMI line code and superframe format, no line powering, DSX-1 interface	PUB 77375
04DU9.CN	1.544 Mbit/s with AMI line code and non-ANSI extended superframe format but no line powering	PUB 77375
04DU9.CX	1.544 Mbit/s with AMI line code and non-ANSI extended superframe format, no line powering, DSX-1 interface	PUB 77375
04DU9.DN	1.544 Mbit/s with B8ZS line code and superframe format (DS1 CCC) but no line powering	ANSI T1.403-1995, PUB 77375
04DU9.DX	1.544 Mbit/s with B8ZS line code and superframe format (DS1 CCC), no line powering, DSX-1 interface	PUB 77375
04DU9.SN	1.544 Mbit/s with B8ZS line code and non-ANSI extended superframe format (DS1 CCC) but no line powering	PUB 77375
04DU9.SX	1.544 Mbit/s with B8ZS line code and non-ANSI extended superframe format (DS1 CCC), no line powering, DSX-1 interface	PUB 77375

[†] The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-3 Customer Location DS1 Network Channel Interface Codes (Continued)

NCI Code	Description	Reference Source [†]
	End-User Interfaces (Continued)	
04DU9.1KN	1.544 Mbit/s with AMI line code and ANSI extended superframe format but no line powering	ANSI T1.403-1995 * PUB 77375
04DU9.1KX	1.544 Mbit/s with AMI line code and ANSI extended superframe format, no line powering, DSX-1 interface	PUB 77375
04DU9.1SN	1.544 Mbit/s with B8ZS line code and ANSI extended superframe format (DS1 CCC) but no line powering	ANSI T1.403-1995 * PUB 77375
04DU9.1SX	1.544 Mbit/s with B8ZS line code and ANSI extended superframe format (DS1 CCC), no line powering, DSX-1 interface	PUB 77375
	Carrier Interfaces	
04DJ9.15	Joint designed 1.544 Mbit/s with AMI line code and superframe format	PUB 77375
04DJ9.15B	Joint designed 1.544 Mbit/s with B8ZS line code and superframe format (DS1 CCC)	ANSI T1.102-1993, PUB 77375
04DJ9.15K	DSX-1 templated 1.544 Mbit/s with AMI line code and non-ANSI extended superframe format	PUB 77375
04DJ9.15S	Joint designed 1.544 Mbit/s with B8ZS line code and non-ANSI extended superframe format (DS1 CCC)	PUB 77375
04DJ9.1K	Joint designed 1.544 Mbit/s with AMI line code and ANSI extended superframe format	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375
04DJ9.1S	Joint designed 1.544 Mbit/s with B8ZS line code and ANSI extended superframe format (DS1 CCC)	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375

[†] The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

* The requirement of the ANSI standard that the customer signal be attenuated toward U S WEST by no more than 1.5 dB is suspended. The customer is allocated 5.5 dB for their cable and wire until further notice.

Table 3-3 Customer Location DS1 Network Channel Interface Codes (Continued)

NCI Code	Description	Reference Source [†]
	Carrier Interfaces (Continued)	
04DS9.15	DSX-1 templated 1.544 Mbit/s with AMI line code and superframe format	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375
04DS9.15B	DSX-1 templated 1.544 Mbit/s with B8ZS line code and superframe format (DS1 CCC)	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375
04DS9.15K	DSX-1 templated 1.544 Mbit/s with AMI line code and non-ANSI extended superframe format	ANSI T1.102-1993, PUB 77375
04DS9.15S	DSX-1 templated 1.544 Mbit/s with B8ZS line code and non-ANSI extended superframe format (DS1 CCC)	ANSI T1.102-1993, PUB 77375
04DS9.1K	DSX-1 templated 1.544 Mbit/s with AMI line code and ANSI extended superframe format	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375
04DS9.1S	DSX-1 templated 1.544 Mbit/s with B8ZS line code and ANSI extended superframe format (DS1 CCC)	ANSI T1.102-1993, ANSI T1.107-1995, PUB 77375
04DS9.15L	DSX-1 templated 1.544 Mbit/s with AMI line code and superframe format and with single frequency voice band signaling provided by U S WEST Communications, Inc.	PUB 77310
04DS9.EA	E&M signaling	PUB 77310
04DS9.GO	Ground-Start - open end	PUB 77310
04DS9.GS	Ground-Start - closed end	PUB 77310
04DS9.LO	Loop-Start - open end	PUB 77310
04DS9.LS	Loop-Start - closed end	PUB 77310
04DS9.NO	Transmission only - no signaling	PUB 77310

[†]   The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Tables 3-4 and 3-5 include similar lists of sub-DS1 NCI codes available with services for which COMMAND A LINK[SM] is an option. These NCI codes describe the network interface at the customer's location and at a central office respectively.

Table 3-4 Customer Location Sub-DS1 Network Channel Interface Codes

N C I Codes	D e s c r i p t i o n	R e f e r e n c e S o u r c e †
	A n a l o g I n t e r f a c e s	
02DA2 04DA2 06DA2	Data stream in voice frequency band at End-User premises	PUB 77310
02DA2.C1 04DA2.C1 06DA2.C1	Data stream in voice frequency band at End-User premises, optional C1 conditioning	PUB 77311
02DA2.C2 04DA2.C2 06DA2.C2	Data stream in voice frequency band at End-User premises, optional C2 conditioning	PUB 77311
02DA2.C4 04DA2.C4 06DA2.C4	Data stream in voice frequency band at End-User premises, optional C4 conditioning (no mid-link)	PUB 77311
02DA2.C11 04DA2.C11 06DA2.C11	Data stream in voice frequency band at End-User premises, optional C1 and D1 conditioning (2 point only)	PUB 77311
02DA2.C21 04DA2.C21 06DA2.C21	Data stream in voice frequency band at End-User premises, optional C2 and D1 conditioning (2 point only)	PUB 77311
02DA2.C41 04DA2.C41 06DA2.C41	Data stream in voice frequency band at End-User premises, optional C4 and D1 conditioning (2 point only)	PUB 77311
02DA2.D1 04DA2.D1 06DA2.D1	Data stream in voice frequency band at End-User premises, optional D1 conditioning (2 point only)	PUB 77311
04DB2	Data stream in voice frequency band at IC terminal location	PUB 77310
04EA2.E 06EA2.E	Type I E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on E lead.	PUB 77310
04EA2.M 06EA2.M	Type I E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310
06EB2.E 08EB2.E	Type II E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on E lead.	PUB 77310
06EB2.M 08EB2.M	Type II E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310

† The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-4 Customer Location Sub-DS1 Network Channel Interface Codes (Continued)

NCI Codes	Description	Reference Source [†]
	Analog Interfaces (Continued)	
08EC2	Type III E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310
02GO2 04GO2	Ground-start loop signaling - open end	PUB 77310
02GS2 04GS2	Ground-start loop signaling - closed end	PUB 77310
02LA2	End-User loop start loop signaling - Type A registered port, open end	PUB 77310
02LA2.DB	End-User loop start loop signaling - Type A registered port, open end, optional DB data enhancement	PUB 77311
04DB2	Data stream in voice frequency band at IC terminal location	PUB 77310
04EA2.E 06EA2.E	Type I E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on E lead.	PUB 77310
04EA2.M 06EA2.M	Type I E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310
06EB2.E 08EB2.E	Type II E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on E lead.	PUB 77310
06EB2.M 08EB2.M	Type II E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310
08EC2	Type III E&M signaling at either IC terminal location or End-User premises. IC or End-User originates on M lead.	PUB 77310
02GO2 04GO2	Ground-start loop signaling - open end	PUB 77310
02GS2 04GS2	Ground-start loop signaling - closed end	PUB 77310
02LA2	End-User loop start loop signaling - Type A registered port, open end	PUB 77310

[†] The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-4 Customer Location Sub-DS1 Network Channel Interface Codes (Continued)

NCI Codes	Description	Reference Source [†]
	Analog Interfaces (Continued)	
02LA2.DB	End-User loop start loop signaling - Type A registered port, open end, optional DB data enhancement	PUB 77311
02LB2	End-User loop start loop signaling - Type B registered port, open end	PUB 77310
02LB2.DB	End-User loop start loop signaling - Type B registered port, open end, optional DB data enhancement	PUB 77311
02LC2	End-User loop start loop signaling - Type C registered port, open end	PUB 77310
02LC2.DB	End-User loop start loop signaling - Type C registered port, open end, optional DB data enhancement	PUB 77311
02LG2	Loop start signaling - Class A registered port (open end) with repeated ringing	PUB 77311
02LG2.DB	Loop start signaling - Class A registered port (open end) with repeated ringing, optional DB data enhancement	PUB 77311
02LO2 04LO2	Loop-start loop signaling - open end	PUB 77310
02LO2.DB	Loop-start loop signaling - open end, optional DB data enhancement	PUB 77311
02LS2 04LS2	Loop-start loop signaling - closed end, 600 ohms	PUB 77310
04LS2.DB	Loop-start loop signaling - closed end, 600 ohms, optional DB data enhancement	PUB 77311
02LS3	Loop-start loop signaling - closed end, 900 ohms	PUB 77310
02LS3.M	Loop-start loop signaling - closed end, 900 ohms, CO answering service concentrator	PUB 77310
02NO2 04NO2	No signaling interface, transmission only	PUB 77310
04SF2.LO	Single-frequency signaling within voice frequency band at an IC terminal location. SF to loop signaling, loop start, open end.	PUB 77310
04SF2.LS	Single-frequency signaling within voice frequency band at an IC terminal location. SF to loop signaling, loop start, closed end.	PUB 77310

[†]   The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-4 Customer Location Sub-DS1 Network Channel Interface Codes (Continued)

NCI Codes	Description	Reference Source †
	Digital Interfaces	
04DU5.19	19.2 kbit/s End User Interface	PUB 77312
04DU5.24	2.4 kbit/s End User Interface	PUB 77312
04DU5.48	4.8 kbit/s End User Interface	PUB 77312
04DU5.56	56.0 kbit/s End User Interface	PUB 77312
04DU5.64	64.0 kbit/s End User Interface	PUB 77312
04DU5.96	9.6 kbit/s End User Interface	PUB 77312
04DU5.24S	2.4 kbit/s End User Interface with Secondary Channel	PUB 77312
04DU5.19S	19.2 kbit/s End User Interface with Secondary Channel	PUB 77312
04DU5.48S	4.8 kbit/s End User Interface with Secondary Channel	PUB 77312
04DU5.56S	56.0 kbit/s End User Interface with Secondary Channel	PUB 77312
04DU5.96S	9.6 kbit/s End User Interface with Secondary Channel	PUB 77312
04DV5.BA	Digital Data Over Voice 2.4 kbit/s	PUB 77331
04DV5.BB	Digital Data Over Voice 4.8 kbit/s	PUB 77331
04DV5.BC	Digital Data Over Voice 9.6 kbit/s	PUB 77331
04DV5.BL	Digital Data Over Voice 19.2 kbit/s	PUB 77331

† The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

Table 3-5 Central Office Sub-DS1 Network Channel Interface Codes

NCI Codes	Description	Reference Source [†]
	Analog Interfaces	
02BL2	CO Bridge - Bridge Lifter	PUB 77311
04BR2	CO Bridge - Resistive type	PUB 77311
04BR2.CF	CO Bridge - Resistive type, Conference operation	PUB 77311
04BR2.SP	CO Bridge - Resistive type, Split path operation. An independent path (2 wire bridge) is provided for each direction of transmission.	PUB 77311
	Digital Interfaces	
04BD5.19 *	19.2 kbit/s CO Bridge	PUB 77312
04BD5.24 *	2.4 kbit/s CO Bridge	PUB 77312
04BD5.48 *	4.8 kbit/s CO Bridge	PUB 77312
04BD5.56 *	56.0 kbit/s CO Bridge	PUB 77312
04BD5.96 *	9.6 kbit/s CO Bridge	PUB 77312

[†]   The complete titles and ordering information for these references may be found in the Reference Section at the end of this document.

*   U S WEST currently does not use the 04BD5.__ NCI code in some jurisdictions.

3.4   Information Codes

An Information code is a new concept used to define an interface (typically in a central office). The Information code uses the same format as an NCI code but normally includes information that may not be of a technical nature. Usually, some of the technical information normally found in a NCI code is omitted. Because of this limitation, Information codes may not be used at a customer interface.

The COMMAND A LINK[SM] service uses an Information code at the DCS. The general form is 04CS_.__R where the underlines represent variable characters. The CS denotes a connection to a DCS. The R indicates Customer Reconfigurable. The missing characters indicate the impedance (with values 6 or 9) and the functional type of DCS.

Section 2.4.2 of Chapter 2 discussed the channel rearrangement options. The 04CS_.__R implies that there is an 04DS_.___ interface with the addition of being cross-connected to a DCS with the added capability of being customer reconfigurable.

Table 3-6 lists the applicable "CS" Information codes. The fifth position impedance code (with values 9 or 6) along with the seventh and eighth position option codes may be used to determine the type of port and the generic type of DCS. The impedance code of 9 applies to a DS1 while the code of 6 applies to a DS3. The type of interface available at a specific location will vary subject to equipment availability.

The technically similar NCI codes will vary with the requirements. The proper interface will be selected depending on the NC code of the channel, the NCI code at the customer interface at the other end of the channel, and the rearrangement requirements. For example, a DS1 service channel using an NC code of HCEC and an End-User NCI code of 04DU9.1S both indicate that the DS1 uses B8ZS and ANSI ESF. The technically similar NCI code is 04DS9.1S. Assuming that customer requirements include rearrangements by DS0s, the 04CS9.10R would be selected from Table 3-6. The 04CS9.10R interface would be designed to match the 04DS9.1S interface plus the DCS.

Table 3-6 DCS Information Codes

Information Code (1)	Generic DCS Type	COMMAND A LINK[SM] Port Type	Rearrangable By	Technically Similar NCI Code (2)
04CS9.10R	1/0	DS0 (3)	DS0	04DS9.___
04CS9.10R	1/0	DS1	DS1 & DS0	04DS9.___
04CS9.11R	1/1	DS1	DS1	04DS9.___
04CS6.30R	(4)	DS3	DS3, DS1 & DS0	04DS6.___
04CS9.31R	3/1	DS1	DS1	04DS9.___
04CS6.31R	3/1	DS3	DS3 & DS1	04DS6.___
04CS6.33R	3/3	DS3	DS3	04DS6.___

NOTES:

1. The type of interface available at a specific location will vary subject to equipment availability.

2. The underlines represent several available options.

3. The DS0 port is actually implemented as a DS1 connection on the DCS with a multiplexer attached. See Chapter 2, paragraph 2.3.3 for further information.

4. U S WEST does not have DCSs with these capabilities. A special two-DCS application must be used. See Chapter 2, Section 2.4.4 for further details.

3.5   Digital Switched Services (DSS)

The Digital Switched Services (DSS) combines a DS1 Service with one or more Basic and/or Advanced switched services. The Basic Service provides for a line side connection to the switch. The Advanced Service provides for a trunk side connection to the switch. The U S WEST Technical Publication 77319, *U S WEST Digital Switched Services,* should be consulted for further information.

3.5.1 Basic DSS Service

Figure 3-1 illustrates a typical Basic DSS Service. Figure 3-2 illustrates the equivalent COMMAND A LINK^{SM} services. The HC_G (i.e., HC-G, HCDG, and HCFG) used with the DS1/DSS service are split into a HC_C and a HC_V (the underlines represent several alternatives).

The UCG_ and UDG_ NC code circuits are split into UCG_ or UDG_ circuits respectively. The 04CS9.10R NCI (information) code is used to provide the "Customer Reconfigurable" identification.
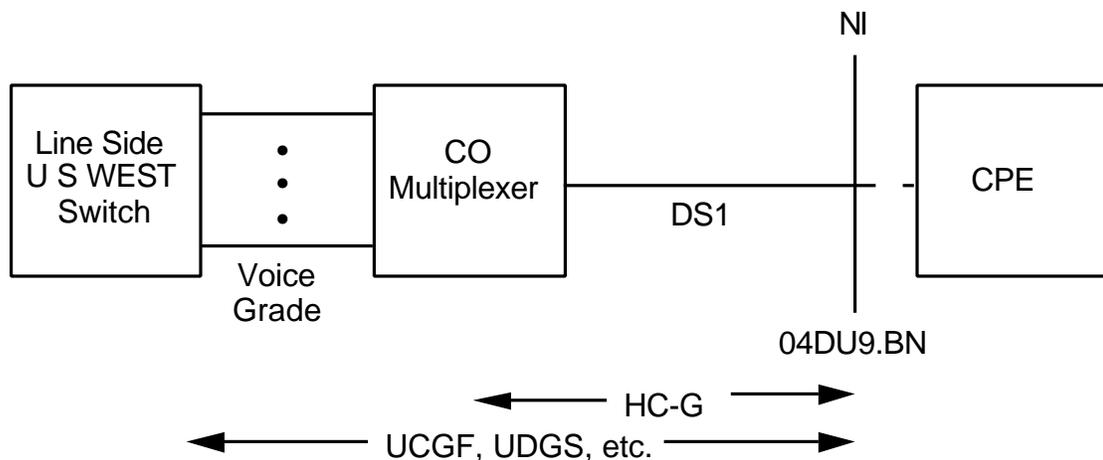
Figure 3-1 Typical Basic DSS Service

First Circuits

```
                                              NI
                                              │
┌──────────┐         ┌──────────┐            │         ┌──────────┐
│ Line Side│    •    │   CO     │            │         │          │
│ U S WEST │    •    │Multiplexer├────────────┼─────────┤   DCS    │
│  Switch  │    •    │          │    DS1     │         │          │
└──────────┘         └──────────┘            │         └──────────┘
              Voice                          │
              Grade                     04CS9.10R
```

$\longleftarrow$ HC-V $\longrightarrow$

$\longleftarrow$ UCGF, UDGS, etc. $\longrightarrow$

Second Circuits

```
            NI                                NI
            │                                 │
┌──────────┐│                                 │┌──────────┐
│          ││                                 ││          │
│   DCS    │├────────────────────────────────┤│   CPE    │
│          ││             DS1                 ││          │
└──────────┘│                                 │└──────────┘
            │                                 │
       04CS9.10R                          04DU9.BN
```

$\longleftarrow$ HC-C $\longrightarrow$

$\longleftarrow$ UCGF, UDGS, etc. $\longrightarrow$
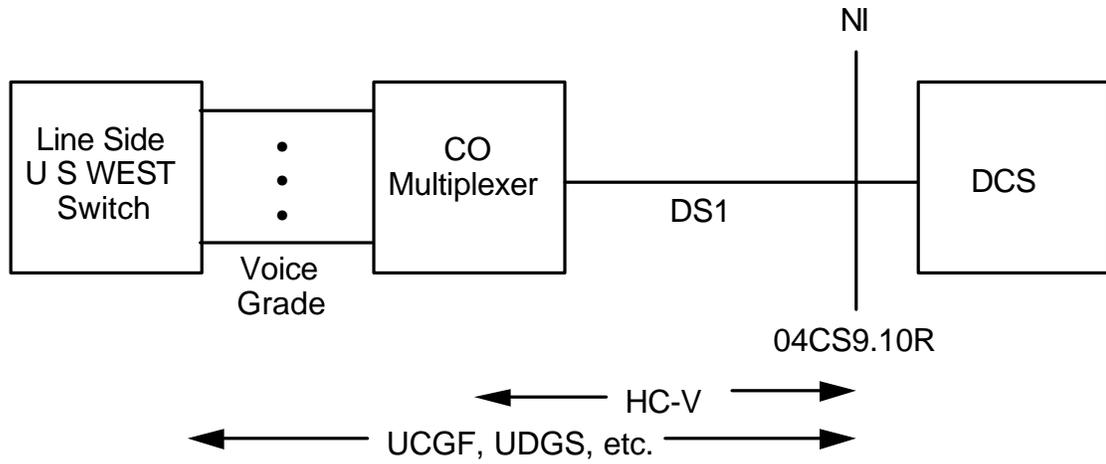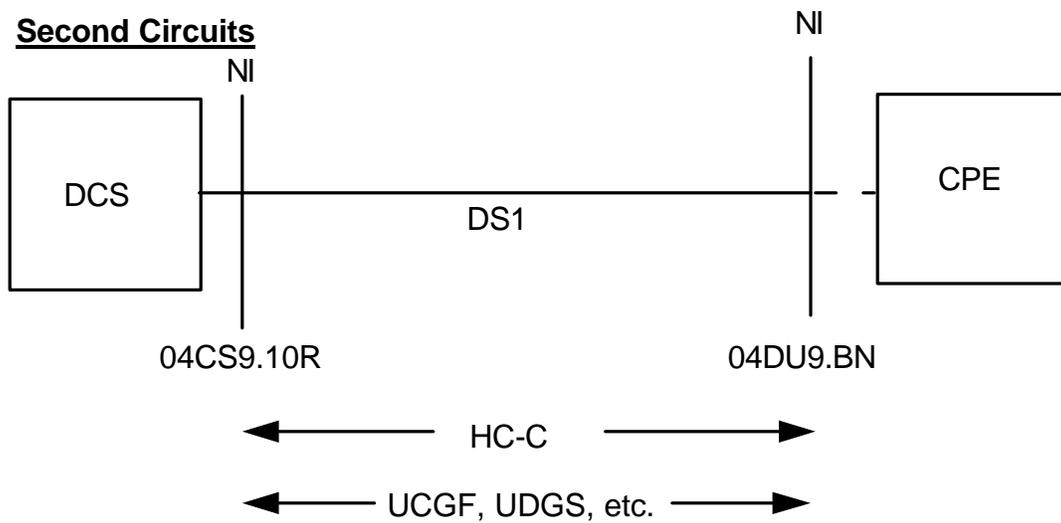
Figure 3-2 Typical Basic DSS Service With COMMAND A LINK[SM]

3.5.2 Advanced DSS Services

Figure 3-3 illustrates a typical Basic DSS Service. Figure 3-4 illustrates the equivalent COMMAND A LINK^{SM} services. The HC_D (i.e., HC-D, HCDD, and HCFD) are split into a HC_C and a HC_D. There is no equivalent to the HC_V replacement with the Advanced service. The HC_D is used.

The UDG_ NC code circuits is split into separate UDG_ circuits. The 04CS9.10R NCI (information) code is used to provide the "Customer Reconfigurable" identification for both the UDG_ and HC_D channels.
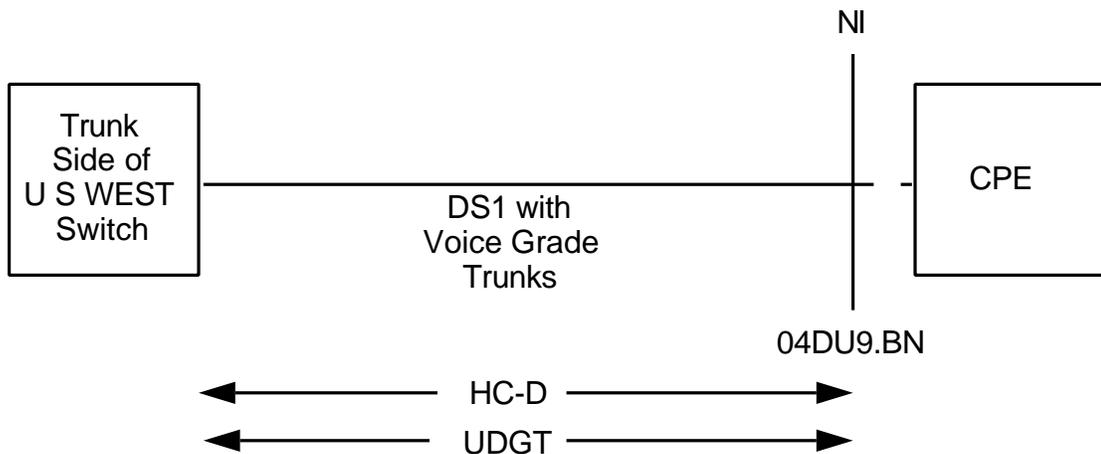
Figure 3-3 Typical Advanced DSS Service

A special case occurs when the U S WEST switch is an analog switch without a digital interface. In this situation, Figures 3-1 and 3-2 would apply but with the appropriate UDG_ codes (e.g., UDGT) being used. Further information can be found in PUB 77319, Chapter 2.

First Circuits

NI

| Trunk Side of U S WEST Switch |

DS1 with
Voice Grade
Trunks

04CS9.10R

| DCS |

←———————— HC-D ————————→

←———————— UDGT ————————→

Second Circuits

NI

NI

| DCS |

DS1 with
Voice Grade
Trunks

| CPE |

04CS9.10R   04DU9.BN

←———————— HC-C ————————→

←———————— UDGT ————————→
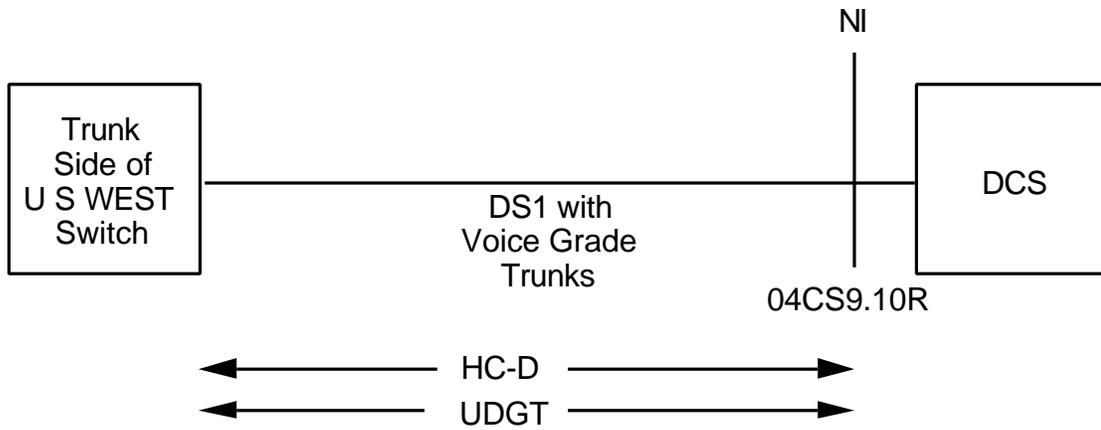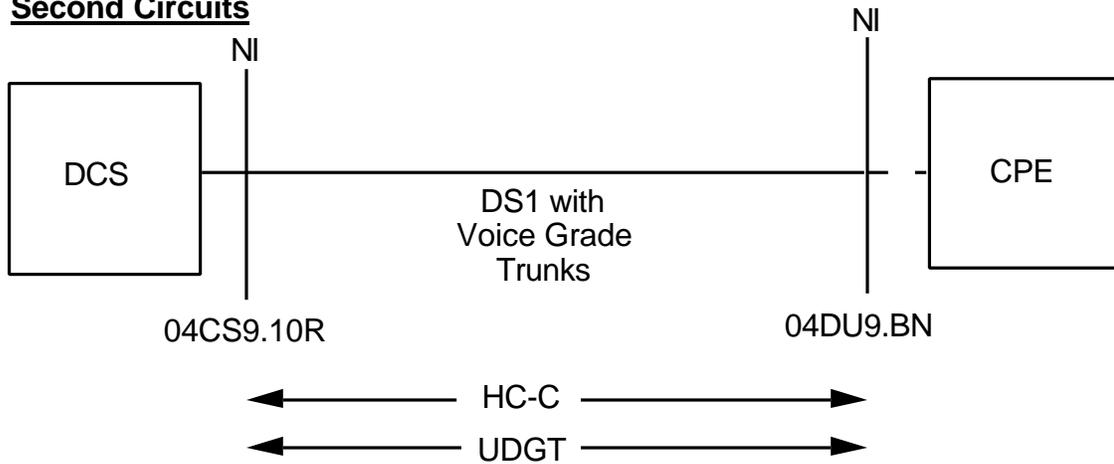
Figure 3-4 Typical Advanced DSS Service With COMMAND A LINK[SM]

3.6 U S WEST Self Healing Network Service

U S WEST Self Healing Network Service (SHNS) offers a premium service arrangement designed to provide high capacity digital services between multiple customer designated premises or between customer designated premises and U S WEST Wire Centers. The SHNS dedicates available bandwidth on the Network exclusively to a single customer. The Technical Publication 77332, *U S WEST Self Healing Network Service (SHNS) (DS1, DS3, OC3, & OC12),* describes the service in greater detail. Figure 3-8 illustrates a typical SHNS network.

The combination of SHNS and COMMAND A LINK[SM] is available with DS1 and DS3 Network Interfaces only . The SHNS interfaces greater than the DS3 interface are not available with COMMAND A LINK[SM]. The available NC/NCI code combinations are listed in Section 4.11.

3.7 Diversity And Avoidance

The U S WEST Diversity and Avoidance Service provides the customer the ability to obtain diverse routing and other topological routing options with many U S WEST services including SHARP and SHNS. The service can be used to provide additional protection by providing diverse routing in both inter-office and central office to customer location loops. Certain geographic areas or central offices can be avoided. These capabilities along with the COMMAND A LINK[SM] rearrangement capabilities will provide the customer with a more reliable service for their critical needs.

This service is described in the U S WEST Technical Publication 77344, *Diversity And Avoidance.* No further information about the service is included in this document since there are no unique Network Channel or Network Channel Interface codes associated with Diversity and Avoidance.

3.8 Self-Healing Alternate Route Protection (SHARP)

Self-Healing Alternate Route Protection (SHARP) is an optional service that improves the reliability of DS1 or DS3 services that are transported over fiber optic facilities. The service is described in PUB 77340, *Self-Healing Alternate Route Protection (SHARP)*.

SHARP provides protection from the customer premises to the Serving Wire Center. SHARP PLUS may be used to also provide protection on interoffice facilities.

U S WEST PRIMARY
WIRE CENTER

NI – – – – – – NI

DS1

DS3

OC-3

0C-12

FOT

CUSTOMER
PREMISES E

NI

CUSTOMER
PREMISES A

DS1

DS1

CPE

DS3

OC-3

FOT

FOT

DS3

OC-3

CPE

0C-12

0C-12

CUSTOMER
PREMISES D

NI

NI

CUSTOMER
PREMISES B

DS1

DS1

CPE

DS3

OC-3

FOT

FOT

DS3

OC-3

CPE

0C-12

0C-12

NI

NI

FOT

NI – – – – – – NI

DS1

DS3

OC-3

0C-12

CPE

CUSTOMER
PREMISES C

LEGEND
FOT =   FIBER OPTIC TERMINAL
NI   =   NETWORK INTERFACE
CPE =   CUSTOMER PROVIDED EQUIPMENT
     =   FIBER FACILITIES

Figure 3-5 Typical Self Healing Network

CONTENTS

CONTENTS (Continued)

4.   Compatible Channel And Interface Combinations

4.1   General Design Criteria

One of the key requirements in designing a network is to insure that the circuits being connected together by the COMMAND A LINK^{SM} option are compatible with each other. There are four criteria that may be used to determine the compatibility of two circuits.

4.1.1 First Criteria

The first criteria is that the NC code of both circuits must be the same or, in a few instances, technically comparable. Tariff and legal issues tend to restrict the channels to be of the same type using the same NC code. Contact your U S WEST representative for specific information.

4.1.2 Second Criteria

The second criteria is that the combination of the two NCI codes for each circuit must appear in the tables of this chapter. This specifically means that the combination of the 04CS_.__R Information code and the NCI code at the customer location must appear in the table for the NC code in Chapter 4. (The underlines indicate that several values may apply.)

4.1.3 Third Criteria

The third criteria is that both of the customer location NCI codes must appear in a comparable NC/NCI combination table for the NC code as if COMMAND A LINK^{SM} was not involved. These tables appear in the specific service reference documents or (if applicable) in the FCC #5 tariff.

4.1.4 Fourth Criteria

The fourth criteria may apply to all types of circuits but typically is a concern only with certain analog circuits. The potential for concern may vary on a case-by-case basis. Each circuit has certain technical parameters which in themselves would meet a customer's needs. However, there is a chance that when two of these circuits are connected together end-to-end, the resulting end-to-end channel will not meet the customer's needs. Should this be the situation, the individual circuits should be ordered with tighter parameters so that when connected together, the end-to-end result is acceptable. This problem can be minimized by ordering Access type of circuits. Access circuits normally have tighter design parameters than Non-Access circuits since they are designed to be connected with another Access circuit and an Interexchange Carrier provided transport channel.

4.1.5 Example

An example may help explain these criteria. This example, illustrated in Figure 4-1, assumes that the circuits are DS1 Access channels using superframe and Alternate Mark Inversion. A customer wishes to connect two locations together with a DS1 for normal use. The customer also wishes to switch to a third location in the event of a disaster. This network will require three DS1 channels. Each would go from the DCS to the customer location. The three DS1 channels would have an NC code of HC-C. All three of the customer locations use either a 04DS9.15 or 04DU9.BN NCI code depending on whether it is a carrier or End-User interface respectively. The Information codes for the DS1 ports at the COMMAND A LINK^{SM} DCS are all 04CS9.10R.
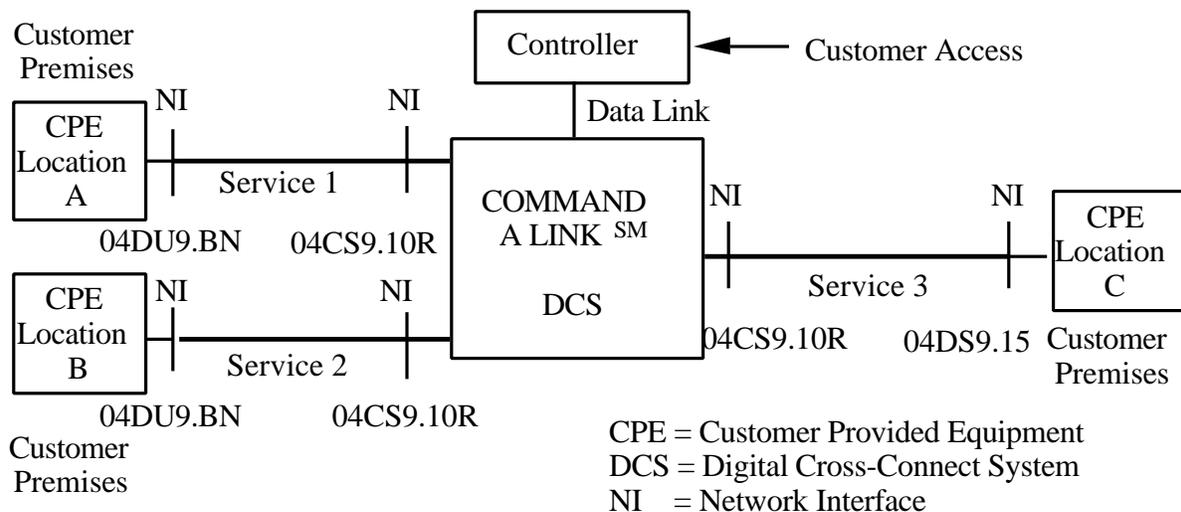
Figure 4-1 COMMAND A LINK^{SM} Network Example

The first criteria is met; all three circuits use the HC-C NC code. An examination of the HC-C portion of Table 4-1 later in this chapter finds that both the 04CS9.10R - 04DS9.15 and the 04CS9.10R - 04DU9.BN combinations are valid. Thus the second criteria is met. The third criteria is also met since a check of PUB 77200 shows that all three possible combinations (04DS9.15 - 04DS9.15, 04DS9.15 - 04DU9.BN, and 04DU9.BN - 04DU9.BN) are valid. The fourth criteria should not apply. Thus the application should be considered to be compatible.

The remainder of this Chapter contains lists of compatible NCI code pairs for each NC code used with the COMMAND A LINK^{SM} option.

Channels and interfaces above the DS3 level may be encountered when transporting the services listed in this document. These higher level services are beyond the scope of this document.

4.2 Generic Configurations

Some generic channel configurations have been developed as an aid in understanding the Network Channel (NC) and Network Channel Interface (NCI) combination tables in the remainder of Chapter 4. These configurations should help design a customer network using COMMAND A LINK^{SM} .

Table 4-2 contains the diagrams and the descriptions of three sizes of COMMAND A LINK^{SM} ports (DS0, DS1 and DS3) as well as the channels that may be encountered using this service. The channel configurations are numbered and appear in the tables (#). Solid lines indicate the channel being described by the NC/NCI code combinations. Dashed lines indicate parts of separately ordered services which, combined with the solid line portion, provide the specified channel. Each line represents one pair or two wires. Thus two lines represent a four wire interface.

An example may help explain the relationship between the configurations and the tables in the latter part of Chapter 4. Assume a 2.4 kbit/s DDS channel is required between the COMMAND A LINK^{SM} DCS and the End-User location. A DS0 port is desired. A brief search of Table 4-2 yields the NC code XA-C (2.4 kbit/s, Two Point, Customer Reconfigurable) and the Information/NCI code combination 04CS9.10R (DCS end) - 04DU5.24 (End-User end). The Configuration Number (#) is 2h. By convention, the higher level of unequal interfaces is listed first.

Configuration 2h in Table 4-1 shows the solid lines from the End-User Network Interface (designated by NCI) to the DS0 port. The DS0 port is indicated by dashed lines since the port was separately ordered. Note that the channel, as indicated by "NC", goes the entire distance between the two Network Interfaces as designated by the Information and NCI codes 04CS9.10R and 04DU5.24.

An alternative explanation of Configuration 2h exists. The dashed portion of Configuration 2h could represent a DS1 with CO multiplexing connected to a COMMAND A LINK^{SM} DS1 port (Configuration 10e).

Should the above mentioned 2.4 kbit/s channel be transported entirely on a customer's (End-User's) DS1 to their location (i.e. no CO multiplexing), Configuration 1b would apply to the DS1. No 2.4 kbit/s channel level NC/NCI combination applies in this situation. Configuration 1c would apply if the customer was an Interexchange Carrier.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK[SM]

#	Configuration *	Description
	NCI DCS	COMMAND A LINK[SM] DS1 or DS3 port.
1		A two point Special Access/Private Line Service where the channel and interfaces have the same "value", e.g. the channel indicates DS1, and both interfaces indicate DS1.
1a		Same as Configuration 1, except that both NCI's are located in the CO, next to the DCS.
1b		Same as Configuration 1, except that the first NCI represents the DCS and the second NCI (SECNCI) represents an End-User.
1c		Same as Configuration 1, except that the first NCI represents an IC and the second NCI (SECNCI) represents the DCS.
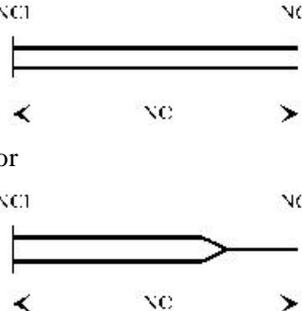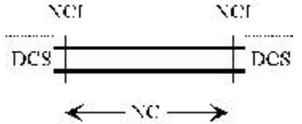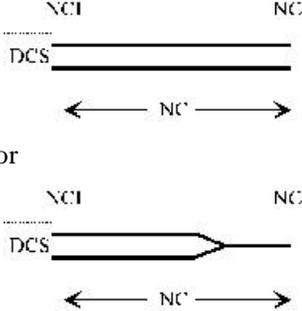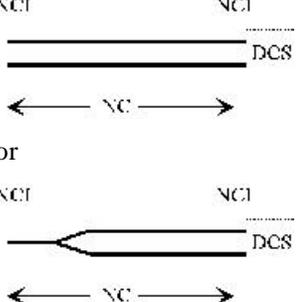
* The NCI code at the DCS is actually an Information code.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK^{SM} (Cont.)

#	Configuration *	Description
1e	 or 	Same as Configuration 1 except the DS1 or DS3 Service has the Self Healing Alternate Route Protection (SHARP) option at ONE END ONLY. CP = Customer Premises S = Protection Switch SWC = Serving Wire Center AWC = Alternate Wire Center
1g		Same as Configuration 1 except the DS1 or DS3 Service has the Self Healing Alternate Rout Protection (SHARP) option at ONE END & INCLUDES INTEROFFICE FACILITIES. (SHARP PLUS) CP = Customer Premises S = Protection Switch SWC = Serving Wire Center AWC = Alternate Wire Center

* The NCI code at the DCS is actually an Information code.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK^{SM} (Cont.)

#	C o n f i g u r a t i o n *	D e s c r i p t i o n
2a	NCI ... NCI ... MUX ... MUX ... NC	A two point Special Access/Private Line Service where both interfaces have a higher "value" (bit rate) than the channel. This Configuration requires additional information showing both relationships to the higher services, i.e. the Configuration 10s, through the use of the Connecting Facility Assignment, (CFA) and Secondary CFA (SCFA).
2b	NCI ... NCI ... MUX ... NC or NCI ... NCI ... MUX ... NC or NCI ... NCI ... MUX ... NC	Same as Configuration 2, except that the first NCI has a lower bit rate than the second NCI (SECNCI). In addition, the SCFA should be used to indicate the relationship between this Configuration and Configuration 10.
2c	NCI ... NCI ... MUX ... DCS ... NC	Same as Configuration 2, except that the second NCI (SECNCI) represents a DCS.
2h	NCI ... NCI ... DCS ... MUX ... NC or NCI ... NCI ... DCS ... MUX ... NC or NCI ... NCI ... DCS ... MUX ... NC	The same as configuration 2 except that the NCI is a DCS. The DCS/MUX combination may be a COMMAND A LINK^{SM} DS0 port.
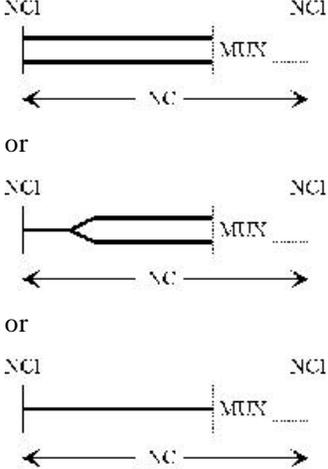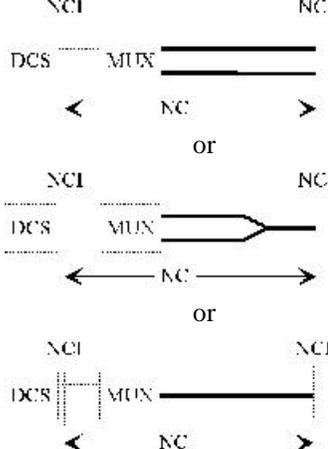
* The NCI code at the DCS is actually an Information code.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK^{SM} (Cont.)

#	Configuration *	Description
2i		The same as configuration 2a except that the NCI is a DCS. The DCS/MUX combination may be a COMMAND A LINK^{SM} DS0 port.
2j		The same as configuration 2a except that the NCI is a DCS. The DCS/MUX combination may be a COMMAND A LINK^{SM} DS0 port.
2k		The same as Configuration 2b except that the second NCI (SECNCI) represents a DCS. The DCS/MUX combination may be a COMMAND A LINK^{SM} DS0 port.
3		A Switched Access Service, Feature Group A, which indicates the connection between the line side of a LEC switch (i.e., first point of switching, or FPOS)) and the interface at a customer premises.
3a		Similar to Configuration 3 only a Basic Digital Switched Service connected to the COMMAND A LINK^{SM} DCS. The interface at a different level than the DCS.

* The NCI code at the DCS is actually an Information code.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK^{SM} (Cont.)

#	C o n f i g u r a t i o n *	D e s c r i p t i o n
3b	NCI — DCS — NC	Similar to Configuration 3 only a Basic Digital Switched Service connected to the COMMAND A LINK^{SM} DCS. The interface at the same level as the DCS.
4	NCI — NC	A Switched Access Service, Feature Groups B, C or D, which indicates the connection between the trunk side of a LEC switch (e.g., first point of switching, or FPOS) and the interface at a customer premises.
4a	NCI — DCS — NC	Similar to Configuration 4 only an Advanced Digital Switched Service connected to the COMMAND A LINK^{SM} DCS..
5	NCI — NC	A WATS Access Line which indicates the connection between a LEC switch ()providing FGC or FGD service for access to 800- or WATS-type services) and the interface at an End-User s premises.
5b	NCI — Mux — DCS — NC	Similar to Configuration 5 only a Basic Digital Switched Service connected to the COMMAND A LINK^{SM} DCS..
7	NCI — BRDG — NC	The portion of a multipoint Special Access/Private Line Service which connects the IC-POT to the U S WEST bridge. The channel (indicating CO bridging) and interface have the same "value", e.g. the channel indicates Voice Grade with CO bridging, and the interface indicates Voice Band.
7c	NCI — DCS — MUX — BRDG — NC	The portion of a multipoint Special Access/Private Line Service which connects the COMMAND A LINK^{SM} DCS to the U S WEST bridge. Similar to Configurations 7 and 8. The DCS/MUX combination may be a COMMAND A LINK^{SM} DS0 port.
8	NCI — BRDG — NC	The portion of a multipoint Special Access/Private Line Service which connects the EU-POT to the U S West bridge. The channel (indicating CO bridging) and interface have the same "value", e.g. the channel indicates Voice Grade with CO bridging, and the interface indicates Voice Band.
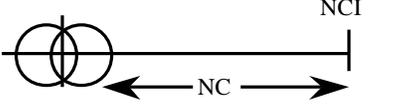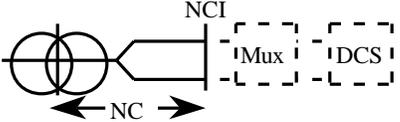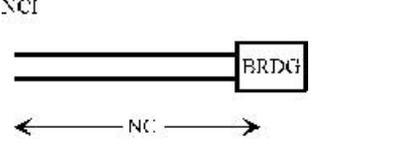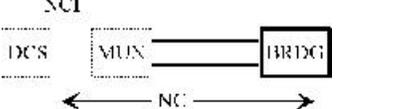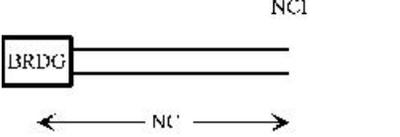
* The NCI code at the DCS is actually an Information code.

Table 4-1 Generic Configurations Encountered With COMMAND A LINK[SM] (Cont.)

#	Configuration *	Description
10	NCI [MUX] NC	A two point Special Access/Private Line Service with one interface and one channel. This Configuration requires a customer specified CO multiplexing location using CLLI. The channel (indicating CO multiplexing) and interface have the same "value." Example: both the channel and the interface indicate HC1. The customer will assign lower bit rate services into the Configuration 10 (e.g. see Configuration 2).
10e	NCI DCS [MUX] NC	Same as Configuration 10, except the high rate side of the multiplexer is connected to the DCS. Does not represent a COMMAND A LINK[SM] DS0 port.
22	NCI NCI NC Node = ■	A two point Special Access/Private line Self-Healing, premium service, utilizing a ring architecture. The two interfaces are at the same level.
22a	NCI [Mux] NC Node = ■	The same as Configuration 22 except that there is only one interface and one channel. This Configuration requires a customer specified CO multiplexing location using CLLI. The channel (indicating CO multiplexing) and interface have the same "value." Example: both the channel and the interface indicate HC3. The customer will assign lower bit rate services into the Configuration 10 (e.g. see Configuration 2).
22b	NCI NCI [DCS] NC Node = ■	The same as Configuration 22 except that the SECNCI represents a connection to a COMMAND A LINK[SM] DCS. The NCI represents an Interexchange carrier.
22c	NCI NCI [DCS] NC Node = ■	The same as Configuration 22 except that the NCI represents a connection to a COMMAND A LINK[SM] DCS. The SECNCI represents an End-User.
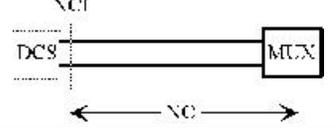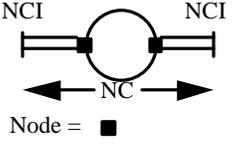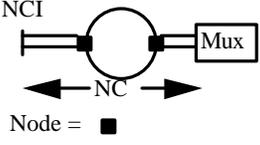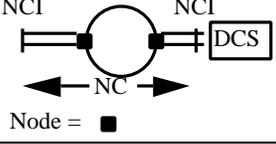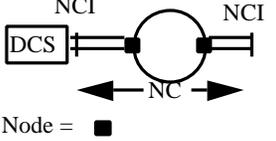
* The NCI code at the DCS is actually an Information code.

4.3   U S WEST Digital Data Service

U S WEST Technical Publications 77204 and 77312 should be consulted for a full service description. Tables 4-2 through 4-13 list the NC/NCI code combinations for the U S WEST Digital Data Service. The "Customer Reconfigurable" function may be found only by looking at the 04CS9.10R NCI code.

4.3.1 Access Service

Table 4-2 Digital Access Service 1 (DA1) - 2.4 kbit/s

NC/NCI Combinations						
NC = **X A - C** Two-point 2.4 kbit/s, Customer Reconfigurable						
NC = **X A - X** Two-point 2.4 kbit/s, Without Error Correction, (Customer Reconfigurable)						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.24	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-2 Digital Access Service 1 (DA1) - 2.4 kbit/s (Continued)

		NC/NCI Combinations
NC =	**X A - V**	Multipoint 2.4 kbit/s, With CO Bridging, Customer Reconfigurable
NC =	**X A - E**	Multipoint 2.4 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)
NC =	**X A - Y**	Multipoint 2.4 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)
NC =	**X A B V**	Multipoint 2.4 kbit/s, With CO Bridging, Secondary Channel, Customer Reconfigurable
NC =	**X A B E**	Multipoint 2.4 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)
NC =	**X A B Y**	Multipoint 2.4 kbit/s, With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable)

Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
7c	04CS9.10R	-	04BD5.24 *				

*   U S WEST currently does not use the 04BD5.24 NCI code in the provisioning process. The code is
   included for technical description purposes.

Table 4-2 Digital Access Service 1 (DA1) - 2.4 kbit/s (Continued)

NC/NCI Combinations						
NC = **X A B C** Two-point 2.4 kbit/s, Secondary Channel, Customer Reconfigurable						
NC = **X A B X** Two-point 2.4 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.24S	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-3 Digital Access Service 2 (DA2) - 4.8 kbit/s

<table>
<tr><td colspan="8" align="center">N C / N C I C o m b i n a t i o n s</td></tr>
<tr><td colspan="8">NC = X B - C   Two-point 4.8 kbit/s, Customer Reconfigurable</td></tr>
<tr><td colspan="8">NC = X B - X   Two-point 4,8 kbit/s, Without Error Correction, (Customer Reconfigurable)</td></tr>
<tr>
<td>Config #</td>
<td>N C I (N C I)</td>
<td>-</td>
<td>N C I (S E C N C I)</td>
<td>Config #</td>
<td>N C I (N C I)</td>
<td>-</td>
<td>N C I (S E C N C I)</td>
</tr>
<tr><td>2h</td><td>04CS9.10R</td><td>-</td><td>04DU5.48</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.BN</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.BX</td></tr>
<tr><td>2j</td><td>04DJ9.15</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.DN</td></tr>
<tr><td>2j</td><td>04DS9.15</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.DX</td></tr>
<tr><td>2j</td><td>04DJ9.15B</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.CN</td></tr>
<tr><td>2j</td><td>04DS9.15B</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.CX</td></tr>
<tr><td>2j</td><td>04DJ9.15K</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.SN</td></tr>
<tr><td>2j</td><td>04DS9.15K</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.SX</td></tr>
<tr><td>2j</td><td>04DJ9.15S</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.1KN</td></tr>
<tr><td>2j</td><td>04DS9.15S</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.1KX</td></tr>
<tr><td>2j</td><td>04DJ9.1K</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.1SN</td></tr>
<tr><td>2j</td><td>04DS9.1K</td><td>-</td><td>04CS9.10R</td><td>2i</td><td>04CS9.10R</td><td>-</td><td>04DU9.1SX</td></tr>
<tr><td>2j</td><td>04DJ9.1S</td><td>-</td><td>04CS9.10R</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2j</td><td>04DS9.1S</td><td>-</td><td>04CS9.10R</td><td></td><td></td><td></td><td></td></tr>
</table>

Table 4-3 Digital Access Service 2 (DA2) - 4.8 kbit/s (Continued)

NC/NCI Combinations		
NC = **X B - V**	Multipoint 4.8 kbit/s, With CO Bridging, Customer Reconfigurable	
NC = **X B - E**	Multipoint 4.8 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)	
NC = **X B - Y**	Multipoint 4.8 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)	
NC = **X B B V**	Multipoint 4.8 kbit/s, With CO Bridging, Secondary Channel, Customer Reconfigurable	
NC = **X B B E**	Multipoint 4.8 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)	
NC = **X B B Y**	Multipoint 4.8 kbit/s, With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable)	

Config #	NCI (NCI) - NCI (SECNCI)	Config #	NCI (NCI) - NCI (SECNCI)
7c	04CS9.10R - 04BD5.48 *		

*   U S WEST currently does not use the 04BD5.48 NCI code in the provisioning process. The code is included for technical description purposes.

Table 4-3 Digital Access Service 2 (DA2) - 4.8 kbit/s (Continued)

NC/NCI Combinations						
NC = **X B B C** Two-point 4.8 kbit/s, Secondary Channel, Customer Reconfigurable						
NC = **X B B X** Two-point 4.8 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.48S	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-4 Digital Access Service 3 (DA3) - 9.6 kbit/s

NC/NCI Combinations						
NC = **X G - C** Two-point 9.6 kbit/s, Customer Reconfigurable						
NC = **X G - X** Two-point 9.6 kbit/s, Without Error Correction, (Customer Reconfigurable)						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DU5.96	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-4 Digital Access Service 3 (DA3) - 9.6 kbit/s (Continued)

NC/NCI Combinations		
NC = **X G - V**	Multipoint 9.6 kbit/s, With CO Bridging, Customer Reconfigurable	
NC = **X G - E**	Multipoint 9.6 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)	
NC = **X G - Y**	Multipoint 9.6 kbit/s, With CO Bridging - Master Leg, No Error Correcting (Customer Reconfigurable)	
NC = **X G B V**	Multipoint 9.6 kbit/s, With CO Bridging, Secondary Channel, Customer Reconfigurable	
NC = **X G B E**	Multipoint 9.6 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)	
NC = **X G B Y**	Multipoint 9.6 kbit/s, With CO Bridging, Secondary Channel - Master Leg, No Error Correcting (Customer Reconfigurable)	

Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
7c	04CS9.10R	-	04BD5.96 *				

*   U S WEST currently does not use the 04BD5.96 NCI code in the provisioning process. The code is included
for technical description purposes.

Table 4-4 Digital Access Service 3 (DA3) - 9.6 kbit/s (Continued)

	NC/NCI Combinations						
NC =	**X G B C**	Two-point 9.6 kbit/s, Secondary Channel, Customer Reconfigurable					
NC =	**X G B X**	Two-point 9.6 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**NCI (NCI)**	**-**	**NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**-**	**NCI (SECNCI)**
2h	04CS9.10R	-	04DU5.96S	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-5 Digital Access Service 4 (DA4) - 56.0 kbit/s

NC/NCI Combinations						
NC = **X H - C**		Two-point 56.0 kbit/s, Customer Reconfigurable				
NC = **X H - X**		Two-point 56.0 kbit/s, Without Error Correction, (Customer Reconfigurable)				
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.56	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-5 Digital Access Service 4 (DA4) - 56.0 kbit/s (Continued)

NC/NCI Combinations
NC = **X H - V**   Multipoint 56.0 kbit/s, With CO Bridging, Customer Reconfigurable
NC = **X H - E**   Multipoint 56.0 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)
NC = **X H - Y**   Multipoint 56.0 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)
NC = **X H B E**   Multipoint 56.0 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)
NC = **X H B V**   Multipoint 56.0 kbit/s, With CO Bridging, Secondary Channel, and Customer Reconfigurable (Customer Reconfigurable)
NC = **X H B Y**   Multipoint 56.0 kbit/s, With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable) *

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
7c	04CS9.10R *	-	04BD5.56 **				

*   The control leg of a 56 kbit/s with Secondary Channel multipoint circuit requires a DS1 with CCC interface.

** U S WEST currently does not use the 04BD5.56 NCI code in the provisioning process. The codes is
   included for technical description purposes.

Table 4-5 Digital Access Service 4 (DA4) - 56.0 kbit/s (Continued)

N C / N C I C o m b i n a t i o n s							
NC =	**X H B C**	Two-point 56 kbit/s, Secondary Channel, Customer Reconfigurable					
NC =	**X H B X**	Two-point 56.0 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.56S	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

The 19.2 kbit/s data rate may not be available in all jurisdictions. This data rate formerly used the XE code set.

Table 4-6 Digital Access Service 5 (DA5) - 19.2 kbit/s

NC/NCI Combinations						
NC = **X C - C** Two-point 19.2 kbit/s, Customer Reconfigurable						
NC = **X C - X** Two-point 19.2 kbit/s, Without Error Correction, (Customer Reconfigurable)						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DU5.19	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

Table 4-6 Digital Access Service 5 (DA5) - 19.2 kbit/s (Continued)

N C / N C I   C o m b i n a t i o n s
NC =   **X C - V**   Multipoint 19.2 kbit/s, With CO Bridging, Customer Reconfigurable
NC =   **X C - E**   Multipoint 19.2 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)
NC =   **X C - Y**   Multipoint 19.2 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)
NC =   **X C B V**   Multipoint 19.2 kbit/s, With CO Bridging, Secondary Channel, Customer Reconfigurable
NC =   **X C B E**   Multipoint 19.2 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)
NC =   **X C B Y**   Multipoint 19.2 kbit/s, With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable)

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
7c	04CS9.10R *	-	04BD5.19 *				

* U S WEST currently does not use the 04BD5.19 NCI code in the provisioning process. The code is included for technical description purposes.

Table 4-6 Digital Access Service 5 (DA5) - 19.2 kbit/s (Continued)

NC/NCI Combinations							
NC =	X C B C	Two-point 19.2 kbit/s, Secondary Channel, Customer Reconfigurable					
NC =	X C B X	Two-point 19.2 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**NCI (NCI)**	**-**	**NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**-**	**NCI (SECNCI)**
2h	04CS9.10R	-	04DU5.19S	2i	04CS9.10R	-	04DU9.BN
				2i	04CS9.10R	-	04DU9.BX
2j	04DJ9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DN
2j	04DS9.15	-	04CS9.10R	2i	04CS9.10R	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CN
2j	04DS9.15B	-	04CS9.10R	2i	04CS9.10R	-	04DU9.CX
2j	04DJ9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SN
2j	04DS9.15K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.SX
2j	04DJ9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KN
2j	04DS9.15S	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1KX
2j	04DJ9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SN
2j	04DS9.1K	-	04CS9.10R	2i	04CS9.10R	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R				
2j	04DS9.1S	-	04CS9.10R				

The 64.0 kbit/s data rate may not be available in all jurisdictions. This data rate formerly used the XE code set.

Table 4-7 Digital Access Service 6 (DA6) - 64.0 kbit/s

NC/NCI Combinations						
NC = **X D - C**		Two-point 64.0 kbit/s, Customer Reconfigurable				
NC = **X C - X**		Two-point 64.0 kbit/s, Without Error Correction, (Customer Reconfigurable)				
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R *	-	04DU5.64	2i	04CS9.10R *	-	04DU9.DN
				2i	04CS9.10R *	-	04DU9.DX
2j	04DJ9.15B	-	04CS9.10R *	2i	04CS9.10R *	-	04DU9.SN
2j	04DS9.15B	-	04CS9.10R *	2i	04CS9.10R *	-	04DU9.SN
2j	04DJ9.15S	-	04CS9.10R *	2i	04CS9.10R *	-	04DU9.1SN
2j	04DS9.15S	-	04CS9.10R *	2i	04CS9.10R *	-	04DU9.1SX
2j	04DJ9.1S	-	04CS9.10R *				
2j	04DS9.1S	-	04CS9.10R *				

*   Requires a DS1 with CCC capable interface.

4.3.2 Non-Access Service

Service Publication 77204 lists the NC codes for the Digital Data Service 31 (DD31) using the same NC codes as the access NC codes. The service DD31 uses the non-access Service Codes listed below. Some states have not converted to using NC and NCI codes for non-access applications.

Data Rate	Service Code	Data Rate	Service Code
2.4	DP, US	19.2 *	DM, US
4.8	DQ, US	56.0	DW, US
9.6	DR, US	64.0 *	DC, US

* These rates may not be available in all jurisdictions.

Table 4-8 Digital Data Service 31 (DD31) - 2.4 kbit/s

NC/NCI Combinations						
NC = **X A - C**		Two-point 2.4 kbit/s, Customer Reconfigurable				
NC = **X A - X**		Two-point 2.4 kbit/s, Without Error Correction, (Customer Reconfigurable)				
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DU5.24				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1KX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1SX

NC/NCI Combinations						
NC = **X A - V**	Multipoint 2.4 kbit/s, With CO Bridging, Customer Reconfigurable					
NC = **X A - E**	Multipoint 2.4 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)					
NC = **X A - Y**	Multipoint 2.4 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
8b	04CS9.10R	-	04BD5.24 *				

* U S WEST currently does not use the 04BD5.24 NCI code in the provisioning process. The code is included for technical description purposes.

Table 4-9 Digital Data Service 31 (DD31) - 4.8 kbit/s

NC =	X B - C	Two-point 4.8 kbit/s, Customer Reconfigurable					
NC =	X B - X	Two-point 4.8 kbit/s, Without Error Correction, (Customer Reconfigurable)					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.48				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1KX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1SX

N C / N C I C o m b i n a t i o n s

NC =	X B - V	Multipoint 4.8 kbit/s, With CO Bridging, Customer Reconfigurable					
NC =	X B - E	Multipoint 4.8 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)					
NC =	X B - Y	Multipoint 4.8 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)					
NC =	X B B V	Multipoint 4.8 kbit/s With CO Bridging, Secondary Channel, Customer Reconfigurable					
NC =	X B B E	Multipoint 4.8 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)					
NC =	X B B Y	Multipoint 4.8 kbit/s With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable)					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
8b	04CS9.10R	-	04BD5.48 *				

* U S WEST currently does not use the 04BD5.48 NCI code in the provisioning process. The code is
included for technical description purposes.

Table 4-9 Digital Data Service 31 (DD31) - 4.8 kbit/s (Continued)

NC/NCI Combinations						
NC = **X B B C**	Two-point 4.8 kbit/s, Secondary Channel, Customer Reconfigurable					
NC = **X B B X**	Two-point 4.8 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.48S				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1SX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1KX

Table 4-10 Digital Data Service 31 (DD31) - 9.6 kbit/s

**N C / N C I C o m b i n a t i o n s**

NC = **X G - C**   Two-point 9.6 kbit/s, Customer Reconfigurable

NC = **X G - X**   Two-point 9.6 kbit/s, Without Error Correction, (Customer Reconfigurable)

Config #	N C I (NCI)	-	N C I (SECNCI)	Config #	N C I (NCI)	-	N C I (SECNCI)
2h	04CS9.10R	-	04DU5.96				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1KX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1SX

**N C / N C I C o m b i n a t i o n s**

NC = **X G - V**   Multipoint 9.6 kbit/s, With CO Bridging, Customer Reconfigurable

NC = **X G - E**   Multipoint 9.6 kbit/s, Leg/Link Without Error Correction
(Customer Reconfigurable)

NC = **X G - Y**   Multipoint 9.6 kbit/s, With CO Bridging - Master Leg, No Error Correction
(Customer Reconfigurable)

NC = **X G B V**   Multipoint 9.6 kbit/s With CO Bridging, Secondary Channel, Customer Reconfigurable

NC = **X G B E**   Multipoint 9.6 kbit/s, Leg/Link Without Error Correction, Secondary Channel
(Customer Reconfigurable)

NC = **X G B Y**   Multipoint 9.6 kbit/s With CO Bridging, Secondary Channel - Master Leg, No Error
Correction (Customer Reconfigurable)

Config #	N C I (NCI)	-	N C I (SECNCI)	Config #	N C I (NCI)	-	N C I (SECNCI)
8b	04CS9.10R	-	04BD5.96 *				

*   U S WEST currently does not use the 04BD5.96 NCI code in the provisioning process. The code is
included for technical description purposes.

Table 4-10 Digital Data Service 31 (DD31) - 9.6 kbit/s (Continued)

NC/NCI Combinations						
NC = **X G B C**	Two-point 9.6 kbit/s, Secondary Channel, Customer Reconfigurable					
NC = **X G B X**	Two-point 9.6 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.96S				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1KX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1SX

The 19.2 kbit/s data rate may not be available in all jurisdictions. This data rate formerly used the XE NC code set.

Table 4-11 Digital Data Service 31 (DD31) - 19.2 kbit/s

NC/NCI Combinations						
NC = **X C - C**	Two-point 19.2 kbit/s, Customer Reconfigurable					
NC = **X C - X**	Two-point 19.2 kbit/s, Without Error Correction, (Customer Reconfigurable)					
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)

Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DU5.19				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1SX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1KX

NC/NCI Combinations						
NC = **X C - V**	Multipoint 19.2 kbit/s, With CO Bridging, Customer Reconfigurable					
NC = **X C - E**	Multipoint 19.2 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)					
NC = **X C - Y**	Multipoint 19.2 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)					
NC = **X C B V**	Multipoint 19.2 kbit/s With CO Bridging, Secondary Channel, Customer Reconfigurable					
NC = **X C B E**	Multipoint 19.2 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)					
NC = **X C B Y**	Multipoint 19.2 kbit/s With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable)					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
8b	04CS9.10R	-	04BD5.19 *				

* U S WEST currently does not use the 04BD5.19 NCI code in the provisioning process. The code is included for technical description purposes.

Table 4-11 Digital Data Service 31 (DD31) - 19.2 kbit/s (Continued)

NC/NCI Combinations						
NC = **X C B C** Two-point 19.2 kbit/s, Secondary Channel, Customer Reconfigurable						
NC = **X C B X** Two-point 19.2 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.19S				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1SX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1KX

Table 4-12 Digital Data Service 31 (DD31) - 56.0 kbit/s

NC/NCI Combinations						
NC = **X H - C** Two-point 56.0 kbit/s, Customer Reconfigurable						
NC = **X H - X** Two-point 56.0 kbit/s, Without Error Correction, (Customer Reconfigurable)						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DU5.56				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1SX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1KX

NC/NCI Combinations						
NC = **X H - V** Multipoint 56.0 kbit/s, With CO Bridging, Customer Reconfigurable						
NC = **X H - E** Multipoint 56.0 kbit/s, Leg/Link Without Error Correction (Customer Reconfigurable)						
NC = **X H - Y** Multipoint 56.0 kbit/s, With CO Bridging - Master Leg, No Error Correction (Customer Reconfigurable)						
NC = **X H B V** Multipoint 56.0 kbit/s With CO Bridging, Secondary Channel, Customer Reconfigurable **						
NC = **X H B E** Multipoint 56.0 kbit/s, Leg/Link Without Error Correction, Secondary Channel (Customer Reconfigurable)						
NC = **X H B Y** Multipoint 56.0 kbit/s With CO Bridging, Secondary Channel - Master Leg, No Error Correction (Customer Reconfigurable) **						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
8b	04CS9.10R	-	04BD5.56 *				

*   U S WEST currently does not use the 04BD5.56 NCI code in the provisioning process. The code is included for technical description purposes.

** The control leg of a 56 kbit/s with Secondary Channel multipoint circuit requires a DS1 with CCC interface.

Table 4-12 Digital Data Service 31 (DD31) - 56.0 kbit/s (Continued)

	NC/NCI Combinations					
NC = **X H B C**	Two-point 56.0 kbit/s, Secondary Channel, Customer Reconfigurable					
NC = **X H B X**	Two-point 56.0 kbit/s Without Error Correction, Secondary Channel, (Customer Reconfigurable)					
Config #	**NCI (NCI)**	**-**	**NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**-**	**NCI (SECNCI)**
2h	04CS9.10R	-	04DU5.56S				
2i	04CS9.10R	-	04DU9.BN	2i	04CS9.10R	-	04DU9.SN
2i	04CS9.10R	-	04DU9.BX	2i	04CS9.10R	-	04DU9.SX
2i	04CS9.10R	-	04DU9.CN	2i	04CS9.10R	-	04DU9.1SN
2i	04CS9.10R	-	04DU9.CX	2i	04CS9.10R	-	04DU9.1SX
2i	04CS9.10R	-	04DU9.DN	2i	04CS9.10R	-	04DU9.1KN
2i	04CS9.10R	-	04DU9.DX	2i	04CS9.10R	-	04DU9.1KX

The 64 kbit/s data rate may not be available in all jurisdictions. This data rate formerly used the XE NC code set.

Table 4-13 Digital Data Service 31 (DD31) - 64.0 kbit/s

N C / N C I C o m b i n a t i o n s						
NC = **X D - C**　　Two-point 64.0 kbit/s, Customer Reconfigurable						
NC = **X D - X**　　Two-point 64.0 kbit/s, Without Error Correction, (Customer Reconfigurable)						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DU5.64	2i	04CS9.10R *	-	04DU9.SN
				2i	04CS9.10R *	-	04DU9.SX
2i	04CS9.10R *	-	04DU9.DN	2i	04CS9.10R *	-	04DU9.1SN
2i	04CS9.10R *	-	04DU9.DX	2i	04CS9.10R *	-	04DU9.1SX

*　Requires a DS1 with CCC capable (i.e., B8ZS) interface.

4.4   U S WEST DS1 Service

A description of the High Capacity Access service may be found in Service Publication 77200, *U S WEST DS1 Service, Network Channel Codes and Network Channel Interface Code Combinations,* and in Technical Publication 77375, *1.544 Mbit/s (DS1) Channels - Technical Specifications for Network Channel Interface Codes Describing Electrical Interfaces at Customer Premises and a U S WEST Communications, Inc. Central Offices and Central Office Multiplexer Options.* The Non-Access HC31 Service may be ordered using the same HC1 Service NC codes (i.e. HC__). The Non-Access Service Code is UH.

Table 4-14 High Capacity Service 1 (HC1)

NC/NCI Combinations						
NC = H C - C Superframe, Alternate Mark Inversion, and Customer Reconfigurable						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.BN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.BX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.BN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.BX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.BN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.BX
1a	04CS9.31R	-	04CS9.10R				
1a	04CS9.31R	-	04CS9.11R	1c	04DJ9.15	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R	1c	04DS9.15	-	04CS9.10R
				1c	04DJ9.15	-	04CS9.11R
2c	Digital *	-	04CS9.10R	1c	04DS9.15	-	04CS9.11R
2c	Digital *	-	04CS9.11R	1c	04DJ9.15	-	04CS9.31R
2c	Digital *	-	04CS9.31R	1c	04DS9.15	-	04CS9.31R

*   The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST.

Table 4-14 High Capacity Service 1 (HC1)(Continued)

NC/NCI Combinations						
NC = **H C - V** Superframe, Alternate Mark Inversion, Customer Reconfigurable, and CO Multiplexing - DS1/Voice and Digital Data						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	-	Multiplexer *
10e	04CS9.11R	-	Multiplexer *				

* The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

NC/NCI Combinations						
NC = **H C D C** ANSI T1.403.1995 Extended Superframe, Alternate Mark Inversion, and Customer Reconfigurable						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.1KN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.1KX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.1KN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.1KX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.1KN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.1KX
1a	04CS9.31R	-	04CS9.10R				
1a	04CS9.31R	-	04CS9.11R	1c	04DJ9.1K	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R	1c	04DS9.1K	-	04CS9.10R
				1c	04DJ9.1K	-	04CS9.11R
2c	Digital *	-	04CS9.10R	1c	04DS9.1K	-	04CS9.11R
2c	Digital *	-	04CS9.11R	1c	04DJ9.1K	-	04CS9.31R
2c	Digital *	-	04CS9.31R	1c	04DS9.1K	-	04CS9.31R

* The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST.

Table 4-14 High Capacity Service 1 (HC1)(Continued)

NC/NCI Combinations						
NC = **H C D V** ANSI T1.403.1995 Extended Superframe, Alternate Mark Inversion, Customer Reconfigurable , and CO Multiplexing - DS1/Voice and Digital Data						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	-	Multiplexer *
10e	04CS9.11R	-	Multiplexer *				

* The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

NC/NCI Combinations							
NC = **H C E C** ANSI T1.403.1995 Extended Superframe, B8ZS & Customer Reconfigurable							
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.1SN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.1SX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.1SN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.1SX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.1SN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.1SX
1a	04CS9.31R	-	04CS9.10R				
1a	04CS9.31R	-	04CS9.11R	1c	04DJ9.1S	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R	1c	04DS9.1S	-	04CS9.10R
				1c	04DJ9.1S	-	04CS9.11R
2c	digital *	-	04CS9.10R	1c	04DS9.1S	-	04CS9.11R
2c	digital *	-	04CS9.11R	1c	04DJ9.1S	-	04CS9.31R
2c	digital *	-	04CS9.31R	1c	04DS9.1S	-	04CS9.31R

* The word "digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST. If this Service is assigned to a DS3 Service, the DS3 must be B8ZS Compatible (e.g., HFZM).

Table 4-14 High Capacity Service 1 (HC1)(Continued)

NC/NCI Combinations						
NC =	**H C E V**	ANSI T1.403.1995 Extended Superframe, B8ZS & Customer Reconfigurable, and CO Multiplexing - DS1/Voice and Digital Data				
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	- NCI (SECNCI)
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	- Multiplexer *
10e	04CS9.11R	-	Multiplexer *			

* The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

NC/NCI Combinations							
NC =	**H C F C**	Non-ANSI Extended Superframe, Alternate Mark Inversion, and Customer Reconfigurable					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.CN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.CX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.CN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.CX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.CN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.CX
1a	04CS9.31R	-	04CS9.10R	1c	04DJ9.15K	-	04CS9.10R
1a	04CS9.31R	-	04CS9.11R	1c	04DS9.15K	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R				
				1c	04DJ9.15K	-	04CS9.11R
2c	digital *	-	04CS9.10R	1c	04DS9.15K	-	04CS9.11R
2c	digital *	-	04CS9.11R	1c	04DJ9.15K	-	04CS9.31R
2c	digital *	-	04CS9.31R	1c	04DS9.15K	-	04CS9.31R

* The word "digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST. If this Service is assigned to a DS3 Service, the DS3 must be B8ZS Compatible (e.g., HFZM).

Table 4-14 High Capacity Service 1 (HC1)(Continued)

N C / N C I C o m b i n a t i o n s						
NC = **H C F V** Non-ANSI Extended Superframe, Alternate Mark Inversion, and Customer Reconfigurable, and CO Multiplexing - DS1/Voice and Digital Data						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	-	Multiplexer *
10e	04CS9.11R	-	Multiplexer *				

*   The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

N C / N C I C o m b i n a t i o n s						
NC = **H C G C** Non-ANSI Extended Superframe, B8ZS and Customer Reconfigurable						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.SN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.SX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.SN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.SX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.SN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.SX
1a	04CS9.31R	-	04CS9.10R				
1a	04CS9.31R	-	04CS9.11R	1c	04DJ9.15S	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R	1c	04DS9.15S	-	04CS9.10R
				1c	04DJ9.15S	-	04CS9.11R
2c	Digital *	-	04CS9.10R	1c	04DS9.15S	-	04CS9.11R
2c	Digital *	-	04CS9.11R	1c	04DJ9.15S	-	04CS9.31R
2c	Digital *	-	04CS9.31R	1c	04DS9.15S	-	04CS9.31R

*   The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST. If this Service is assigned to a DS3 Service, the DS3 must be B8ZS Compatible (e.g., HFZM).

Table 4-14 High Capacity Service 1 (HC1)(Continued)

NC/NCI Combinations						
NC = **H C G V** Non-ANSI Extended Superframe, B8ZS and Customer Reconfigurable, and CO Multiplexing - DS1/Voice and Digital Data						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	-	Multiplexer *
10e	04CS9.11R	-	Multiplexer *				

* The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

NC/NCI Combinations						
NC = **H C Z C** Superframe, B8ZS, and Customer Reconfigurable						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1a	04CS9.10R	-	04CS9.10R	1b	04CS9.10R	-	04DU9.DN
1a	04CS9.10R	-	04CS9.11R	1b	04CS9.10R	-	04DU9.DX
1a	04CS9.10R	-	04CS9.31R	1b	04CS9.11R	-	04DU9.DN
1a	04CS9.11R	-	04CS9.10R	1b	04CS9.11R	-	04DU9.DX
1a	04CS9.11R	-	04CS9.11R	1b	04CS9.31R	-	04DU9.DN
1a	04CS9.11R	-	04CS9.31R	1b	04CS9.31R	-	04DU9.DX
1a	04CS9.31R	-	04CS9.10R				
1a	04CS9.31R	-	04CS9.11R	1c	04DJ9.15B	-	04CS9.10R
1a	04CS9.31R	-	04CS9.31R	1c	04DS9.15B	-	04CS9.10R
				1c	04DJ9.15B	-	04CS9.11R
2c	Digital *	-	04CS9.10R	1c	04DS9.15B	-	04CS9.11R
2c	Digital *	-	04CS9.11R	1c	04DJ9.15B	-	04CS9.31R
2c	Digital *	-	04CS9.31R	1c	04DS9.15B	-	04CS9.31R

* The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g. 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST. If this Service is assigned to a DS3 Service, the DS3 Service must be B8ZS Compatible (e.g. HFZM).

Table 4-14 High Capacity Service 1 (HC1)(Continued)

N C / N C I Combinations						
NC = **H C Z V** Superframe, B8ZS, Customer Reconfigurable and CO Multiplexing - DS1/Voice and Digital Data						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
10e	04CS9.10R	-	Multiplexer *	10e	04CS9.31R	-	Multiplexer *
10e	04CS9.11R	-	Multiplexer *				

* The word "Multiplexer" is used to indicate the channelized function performed at this end of the service.

4.5   U S WEST DS3 Service

The U S WEST DS3 Service is described in Technical Publication 77324, *U S WEST DS-3 Service.* This issue corresponds with Issue C or later of PUB 77324.

The DS3 level NC codes do not denote "Customer Reconfigurable" as in the DDS and DS1 services. The 04CS6.33R and 04CS6.31R Information codes do denote this function.

C-bit parity is available in limited locations.

Table 4-15 High Capacity Service 3 (HC3)

NC/NCI Combinations						
NC = **H F - -** One DS3 (44.736 Mbit/s) using M23 application .						
NC = **H F C -** One DS3 (44.736 Mbit/s) using M23 application with C-bit parity.						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
1b	04CS6.31R	-	04DS6.44 *	1c	04DS6.44 *	-	04CS6.31R
1b	04CS6.33R **	-	04DS6.44 *	1c	04DS6.44 *	-	04CS6.33R **
1a	04CS6.31R	-	04CS6.31R	2c	Digital [†]	-	04CS6.31R
1a	04CS6.31R	-	04CS6.33R	2c	Digital [†]	-	04CS6.33R **
1a	04CS6.33R **	-	04CS6.33R				

[†]   The word "Digital" is used to indicate any NCI code describing a digital interface above the DS3 rate (e.g. 02FCF.54 or 02RFZ.AF) offered by U S WEST.

*   See Chapter 4 of PUB 77324, Issue C or later, for the appropriate code to be realized.

**   The DS3 channel to a 04CS6.33R interface may be unchannelized without M23 format.

Table 4-15 High Capacity Service 3 (HC3) (Continued)

N C / N C I C o m b i n a t i o n s							
NC =	**H F - 1**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for one DS1 Clear Channel at a time per slot using B8ZS line code.					
NC =	**H F C 1**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for one DS1 Clear Channel at a time per slot using B8ZS line code and C-bit parity.					
NC =	**H F - 4**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for four DS1 Clear Channels at a time per slot using B8ZS line code.					
NC =	**H F C 4**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for four DS1 Clear Channels at a time per slot using B8ZS line code and C-bit parity.					
NC =	**H F - 7**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for seven DS1 Clear Channels at a time per slot using B8ZS line code.					
NC =	**H F C 7**	DS3 Channel with Central Office Multiplexing and M23 Multiplexer Framing Format per ANSI T1.107-1995 and can be optioned for seven DS1 Clear Channels at a time per slot using B8ZS line code and C-bit parity.					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
10e	04CS6.31R	-	Multiplexer *	10e	04CS6.33R	-	Multiplexer *

*   The word "Multiplexer" indicates the channelized function performed at this end of the service.

4.6   U S WEST Analog Private Line Service

A full description of this service may be found in PUB 77310, *Private Line Voice Grade Analog Channels For Access Service,* (VG1 - VG10) and in PUB 77311, *Analog Channels for Non-Access Service,* (VG32, VG33, and VG36). Information on these documents may be found in Chapter 7. The information that denotes that the "Customer Reconfigurable" function with Voice Grade services is included in the 04CS9.10R Information code.

Table 4-16 Voice Grade 1 Service (VG1)

NC/NCI Combinations						
NC = **L B - -** No Network Channel Options						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	02GO2	-	04CS9.10R	2h	04CS9.10R	-	02GO2
2k	02GS2	-	04CS9.10R	2h	04CS9.10R	-	02GS2
2k	02LO2	-	04CS9.10R	2h	04CS9.10R	-	02LO2
2k	02LS2	-	04CS9.10R	2h	04CS9.10R	-	02LS2
2k	02NO2	-	04CS9.10R	2h	04CS9.10R	-	02NO2
2k	04GO2	-	04CS9.10R	2h	04CS9.10R	-	04NO2
2k	04GS2	-	04CS9.10R				
2k	04LO2	-	04CS9.10R	2j	04DS9.GO	-	04CS9.10R
2k	04LS2	-	04CS9.10R	2j	04DS9.GS	-	04CS9.10R
2k	04NO2	-	04CS9.10R	2j	04DS9.LO	-	04CS9.10R
				2j	04DS9.LS	-	04CS9.10R
				2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations						
NC = **L B - A** Effective 4 wire						
NC = **L B B -** ELEPL-2						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02GO2	2h	04CS9.10R	-	02GS2
2h	04CS9.10R	-	02LO2	2h	04CS9.10R	-	02LS2
2h	04CS9.10R	-	02NO2				

Table 4-16 Voice Grade 1 Service (VG1)(Continued)

NC/NCI Combinations						
NC = **L B - L** Improved Termination at EU-POT						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04NO2			

NC/NCI Combinations						
NC = **L B - R** Improved Termination at IC-POT						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	04GO2	-	04CS9.10R	2k	04LS2	-	04CS9.10R
2k	04GS2	-	04CS9.10R	2k	04NO2	-	04CS9.10R
2k	04LO2	-	04CS9.10R			

Table 4-17 Voice Grade 2 Service (VG2)

N C / N C I Combinations						
NC = L C - - No Network Channel Options						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02LA2	2j	04DS9.LO	-	04CS9.10R
2h	04CS9.10R	-	02LB2	2j	04DS9.LS	-	04CS9.10R
2h	04CS9.10R	-	02LC2	2j	04DS9.NO	-	04CS9.10R
2h	04CS9.10R	-	02LS2	2k	04LO2	-	04CS9.10R
2h	04CS9.10R	-	02LS3	2k	04LS2	-	04CS9.10R
2h	04CS9.10R	-	02NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	04LS2	2k	04SF2.LO	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04SF2.LS	-	04CS9.10R

N C / N C I Combinations						
NC = L C - A Effective 4 wire						
NC = L C - C Improved Return Loss						
NC = L C B - ELEPL-2						
NC = L C B C ELEPL-2 and Improved Return Loss						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02LA2	2h	04CS9.10R	-	02LS2
2h	04CS9.10R	-	02LB2	2h	04CS9.10R	-	02LS3
2h	04CS9.10R	-	02LC2	2h	04CS9.10R	-	02NO2

N C / N C I Combinations						
NC = L C - L Improved Termination at EU-POT						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04LS2	2h	04CS9.10R	-	04NO2

Table 4-17 Voice Grade 2 Service (VG2) (Continued)

NC/NCI Combinations						
NC = **L C - R** Improved Termination at IC-POT						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	04LO2	-	04CS9.10R	2k	04SF2.LO	-	04CS9.10R
2k	04LS2	-	04CS9.10R	2k	04SF2.LS	-	04CS9.10R

NC/NCI Combinations						
NC = **L C - B** Bridging						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
7c	04CS9.10R	-	BRIDGE				

Table 4-18 Voice Grade 3 Service (VG3)

NC/NCI Combinations							
NC =	L D - -	No Network Channel Options					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02GS2	2k	04GO2	-	04CS9.10R
2h	04CS9.10R	-	02LS2	2k	04LO2	-	04CS9.10R
2h	04CS9.10R	-	02NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	04EA2.E	2k	04SF2.EA	-	04CS9.10R
2h	04CS9.10R	-	04EA2.M	2k	04SF2.GO	-	04CS9.10R
2h	04CS9.10R	-	04GS2	2k	04SF2.GS	-	04CS9.10R
2h	04CS9.10R	-	04LS2	2k	04SF2.LO	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04SF2.LS	-	04CS9.10R
2h	04CS9.10R	-	06EA2.E	2k	06EA2.E	-	04CS9.10R
2h	04CS9.10R	-	06EA2.M	2k	06EA2.M	-	04CS9.10R
2h	04CS9.10R	-	06EB2.E	2k	08EB2.E	-	04CS9.10R
2h	04CS9.10R	-	06EB2.M	2k	08EB2.M	-	04CS9.10R
2h	04CS9.10R	-	08EB2.E				
2h	04CS9.10R	-	08EB2.M				
2j	04DS9.EA	-	04CS9.10R	2j	04DS9.LO	-	04CS9.10R
2j	04DS9.GO	-	04CS9.10R	2j	04DS9.LS	-	04CS9.10R
2j	04DS9.GS	-	04CS9.10R	2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations							
NC =	L D - A	Effective 4 wire					
NC =	L D - C	Improved Return Loss					
NC =	L D B -	ELEPL-2					
NC =	L D B C	ELEPL-2 and Improved Return Loss					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02GS2	2h	04CS9.10R	-	02NO2
2h	04CS9.10R	-	02LS2				

Table 4-18 Voice Grade 3 Service (VG3) (Continued)

N C / N C I C o m b i n a t i o n s							
NC = **L D - L** Improved Termination at EU-POT							
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04GS2	2h	04CS9.10R	-	06EA2.M
2h	04CS9.10R	-	04LS2	2h	04CS9.10R	-	08EB2.E
2h	04CS9.10R	-	04NO2	2h	04CS9.10R	-	08EB2.M
2h	04CS9.10R	-	06EA2.E				

N C / N C I C o m b i n a t i o n s							
NC = **L D - R** Improved Termination at IC-POT							
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2k	04SF2.EA	-	04CS9.10R	2k	06EA2.E	-	04CS9.10R
2k	04SF2.GO	-	04CS9.10R	2k	06EA2.M	-	04CS9.10R
2k	04SF2.GS	-	04CS9.10R	2k	08EB2.E	-	04CS9.10R
2k	04SF2.LO	-	04CS9.10R	2k	08EB2.M	-	04CS9.10R
2k	04SF2.LS	-	04CS9.10R				

Table 4-19 Voice Grade 4 Service (VG4)

N C / N C I C o m b i n a t i o n s						
NC = L E - - No Network Channel Options						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2j	04DS9.NO	-	04CS9.10R				

N C / N C I C o m b i n a t i o n s						
NC = L E - L Improved Termination at EU-POT						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2				

Table 4-20 Voice Grade 5 Service (VG5)

N C / N C I C o m b i n a t i o n s						
NC = **L F - -** No Network Channel Options						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
---	---	---	---	---	---	---	---
2h	04CS9.10R	-	02DA2	2k	04DB2	-	04CS9.10R
2h	04CS9.10R	-	02DE2	2k	04DD2	-	04CS9.10R
2h	04CS9.10R	-	02NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	04DA2				
2h	04CS9.10R	-	04DE2	2j	04DS9.NO	-	04CS9.10R
2h	04CS9.10R	-	04NO2				
2h	04CS9.10R	-	06DA2				

N C / N C I C o m b i n a t i o n s						
NC = **L F C -** C-Conditioning						
NC = **L F F -** Improved Envelope Delay Distortion						
NC = **L F G -** Improved Attenuation Distortion						
NC = **L F J -** Improved Envelope Delay Distortion and Improved Attenuation Distortion						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
---	---	---	---	---	---	---	---
2h	04CS9.10R	-	04DA2	2k	04DB2	-	04CS9.10R
2h	04CS9.10R	-	04DE2	2k	04DD2	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06DA2				

Table 4-20 Voice Grade 5 Service (VG5) (Continued)

NC/NCI Combinations						
NC = **L F - A**	Effective 4 wire					
NC = **L F C A**	C-Conditioning and Effective 4 wire					
NC = **L F F A**	Improved Envelope Delay Distortion and Effective 4 Wire					
NC = **L F G A**	Improved Attenuation Distortion and Effective 4 wire					
NC = **L F J A**	Improved Attenuation Distortion and Improved Envelope Delay Distortion and Effective 4 Wire					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**N C I (S E C N C I)**
2h	04CS9.10R	-	02DA2	2h	04CS9.10R	02NO2

NC/NCI Combinations						
NC = **L F - L**	Improved Termination at EU-POT					
NC = **L F C L**	C Conditioning and Improved Termination at EU-POT					
NC = **L F F L**	Improved Envelope Delay Distortion & Improved Termination at EU-POT					
NC = **L F G L**	Improved Attenuation Distortion and Improved Termination at EU-POT					
NC = **L F J L**	Improved Attenuation Distortion and Improved Envelope Delay Distortion and Improved Termination at EU-POT					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2			

NC/NCI Combinations						
NC = **L F - R**	Improved Termination at IC-POT					
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**N C I (S E C N C I)**
2k	04DB2	-	04CS9.10R	2k	04NO2	04CS9.10R

Table 4-20 Voice Grade 5 Service (VG5) (Continued)

N C / N C I C o m b i n a t i o n s						
NC = **L F C R**		C Conditioning and Improved Termination at IC-POT				
NC = **L F F R**		Improved Envelope Delay Distortion and Improved Termination at IC-POT				
NC = **L F G R**		Improved Attenuation Distortion and Improved Termination at IC-POT				
NC = **L F J R**		Improved Attenuation Distortion and Improved Envelope Delay Distortion and Improved Termination at IC-POT				
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**	
2k	04DB2	- 04CS9.10R	2k	04NO2	- 04CS9.10R	

N C / N C I C o m b i n a t i o n s						
NC = **L F B -**		ELEPL-2				
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**	
2h	04CS9.10R	- 02DA2	2h	04CS9.10R	- 02NO2	

N C / N C I C o m b i n a t i o n s						
NC = **L F - B**		ELEPL-2				
NC = **L F C B**		C Conditioning and Bridging				
NC = **L F T B**		Improved Envelope Delay Distortion and Bridging				
NC = **L F U B**		Improved Attenuation Distortion and Bridging				
NC = **L F V B**		Improved Attenuation Distortion and Improved Envelope Delay Distortion and Bridging				
NC = **L F F B**		Telemetry/Alarm Bridging Service Split Band Active Bridging				
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**	
7c	04CS9.10R	- BRIDGE				

Table 4-21 Voice Grade 6 Service (VG6)

NC/NCI Combinations						
NC = **L G - -** No Network Channel Options						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04DA2	2k	04DB2	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06DA2				
				2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations			
NC = **L G - L** Improved Termination at EU-POT			
NC = **L G C L** C- Conditioning and Improved Termination at EU-POT			
NC = **L G D L** Data Capability and Improved Termination at EU-POT			
NC = **L G E L** C-Conditioning and Data Capability and Improved Termination at EU-POT			
NC = **L G F L** Improved Termination at EU-POT and Improved Envelope Delay Distortion			
NC = **L G G L** Improved Termination at EU-POT and Improved Attenuation Distortion			
NC = **L G J L** Improved Termination at EU-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion			
NC = **L G M L** Data Capability and Improved Termination at EU-POT and Improved Attenuation Distortion			
NC = **L G N L** Data Capability and Improved Termination at EU-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion			
NC = **L G Q L** Data Capability and Improved Termination at EU-POT and Improved Envelope Delay Distortion			
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	04NO2				

Table 4-21 Voice Grade 6 Service (VG6) (Continued)

		NC/NCI Combinations
NC =	**L G - R**	Improved Termination at IC-POT
NC =	**L G C R**	C - Conditioning and Improved Termination at IC-POT
NC =	**L G D R**	Data Capability and Improved Termination at IC-POT
NC =	**L G E R**	C - Conditioning and Data Capability and Improved Termination at IC-POT
NC =	**L G F R**	Improved Termination at IC-POT and Improved Envelope Delay Distortion
NC =	**L G G R**	Improved Termination at IC-POT and Improved Attenuation Distortion
NC =	**L G J R**	Improved Termination at IC-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion
NC =	**L G M R**	Data Capability and Improved Termination at IC-POT and Improved Attenuation Distortion
NC =	**L G N R**	Data Capability and Improved Termination at IC-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion
NC =	**L G Q R**	Data Capability and Improved Termination at IC-POT and Improved Envelope Delay Distortion

Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	04DB2	-	04CS9.10R	2k	04NO2	-	04CS9.10R

Table 4-21 Voice Grade 6 Service (VG6) (Continued)

NC/NCI Combinations						
NC = **L G C -** C - Conditioning						
NC = **L G D -** Data Capability						
NC = **L G E -** C - Conditioning and Data Capability						
NC = **L G F -** Improved Envelope Delay Distortion						
NC = **L G G -** Improved Attenuation Distortion						
NC = **L G J -** Improved Attenuation Distortion and Improved Envelope Delay Distortion						
NC = **L G M -** Data Capability and Improved Attenuation Distortion						
NC = **L G N -** Data Capability and Improved Envelope Delay Distortion and Improved Attenuation Distortion						
NC = **L G Q -** Data Capability and Improved Envelope Delay Distortion						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DA2	2k	04DB2	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06DA2				

Table 4-21 Voice Grade 6 Service (VG6) (Continued)

NC/NCI Combinations		
NC = **L G - B**	Bridging	
NC = **L G C B**	Bridging and C - Conditioning	
NC = **L G D B**	Bridging and Data Capability	
NC = **L G E B**	Bridging and C-Conditioning and Data Capability	
NC = **L G F B**	Bridging and Improved Envelope Delay Distortion	
NC = **L G G B**	Bridging and Improved Attenuation Distortion	
NC = **L G J B**	Bridging and Improved Attenuation Distortion and Improved Envelope Delay Distortion	
NC = **L G M B**	Bridging and Improved Attenuation Distortion and Data Capability	
NC = **L G N B**	Bridging and Improved Attenuation Distortion and Improved Envelope Delay Distortion and Data Capability	
NC = **L G Q B**	Bridging and Improved Envelope Delay Distortion and Data Capability	

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
7c	04CS9.10R	-	BRIDGE				

Table 4-22 Voice Grade 7 Service (VG7)

NC/NCI Combinations						
NC = L H - - No Network Channel Options						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	02GS2	2j	04DS9.EA	-	04CS9.10R
2h	04CS9.10R	-	02LA2	2j	04DS9.GO	-	04CS9.10R
2h	04CS9.10R	-	02LB2	2j	04DS9.GS	-	04CS9.10R
2h	04CS9.10R	-	02LC2	2j	04DS9.LO	-	04CS9.10R
2h	04CS9.10R	-	02LS2	2j	04DS9.LS	-	04CS9.10R
2h	04CS9.10R	-	02LS3	2j	04DS9.NO	-	04CS9.10R
2h	04CS9.10R	-	02NO2	2k	04GO2	-	04CS9.10R
2h	04CS9.10R	-	04EA2.E	2k	04LO2	-	04CS9.10R
2h	04CS9.10R	-	04EA2.M	2k	04LS2	-	04CS9.10R
2h	04CS9.10R	-	04GS2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	04LS2	2k	04SF2.EA	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04SF2.GO	-	04CS9.10R
2h	04CS9.10R	-	06EA2.E	2k	04SF2.GS	-	04CS9.10R
2h	04CS9.10R	-	06EA2.M	2k	04SF2.LO	-	04CS9.10R
2h	04CS9.10R	-	06EB2.E	2k	04SF2.LS	-	04CS9.10R
2h	04CS9.10R	-	06EB2.M	2k	06EA2.E	-	04CS9.10R
2h	04CS9.10R	-	08EB2.E	2k	06EA2.M	-	04CS9.10R
2h	04CS9.10R	-	08EB2.M	2k	08EB2.E	-	04CS9.10R
2h	04CS9.10R	-	08EC2	2k	08EB2.M	-	04CS9.10R
				2k	08EC2	-	04CS9.10R

Table 4-22 Voice Grade 7 Service (VG7) (Continued)

N C / N C I C o m b i n a t i o n s		

NC = **L H - A** Effective 4-Wire

NC = **L H C A** C - Conditioning and Effective 4-Wire

NC = **L H D A** Data Capability and Effective 4-Wire

NC = **L H E A** C - Conditioning and Data Capability and Effective 4-Wire

NC = **L H F A** Improved Envelope Delay Distortion and Data Capability and Effective 4-Wire

NC = **L H G A** Improved Attenuation Distortion and Data Capability and Effective 4-Wire

NC = **L H J A** Improved Attenuation Distortion and Improved Envelope Delay Distortion and Effective 4 Wire

NC = **L H M A** Data Capability and Improved Attenuation Distortion and Effective 4-Wire

NC = **L H N A** Data Capability and Improved Envelope Delay Distortion and Improved Attenuation Distortion and Effective 4-Wire

NC = **L H C S** Data Capability and Improved Envelope Delay Distortion and Effective 4-Wire

NC = **L H B -** ELEPL-2

NC = **L H - C** Improved Return Loss

NC = **L H B C** ELEPL-2 and Improved Return Loss

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	02GS2	2h	04CS9.10R	-	02LC2
2h	04CS9.10R	-	02LA2	2h	04CS9.10R	-	02LS2
2h	04CS9.10R	-	02LB2	2h	04CS9.10R	-	02NO2

Table 4-22 Voice Grade 7 Service (VG7) (Continued)

	N C / N C I C o m b i n a t i o n s	
NC =	**L H - L**	Improved Termination at EU-POT
NC =	**L H C L**	C - Conditioning and Improved Termination at EU-POT
NC =	**L H D L**	Data Capability and Improved Termination at EU-POT
NC =	**L H E L**	C - Conditioning and Data Capability and Improved Termination at EU-POT
NC =	**L H F L**	Improved Termination at EU-POT and Improved Envelope Delay Distortion
NC =	**L H G L**	Improved Termination at EU-POT and Improved Attenuation Distortion
NC =	**L H J L**	Improved Termination at EU-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion
NC =	**L H M L**	Data Capability and Improved Termination at EU-POT and Improved Attenuation Distortion
NC =	**L H N L**	Data Capability and Improved Termination at EU-POT and Improved Envelope Delay Distortion and Improved Attenuation Distortion
NC =	**L H Q L**	Data Capability and Improved Termination at EU-POT and Improved Envelope Delay Distortion

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	04GS2	2h	04CS9.10R	-	06EA2.M
2h	04CS9.10R	-	04LS2	2h	04CS9.10R	-	08EB2.E
2h	04CS9.10R	-	04NO2	2h	04CS9.10R	-	08EB2.M
2h	04CS9.10R	-	06EA2.E	2h	04CS9.10R	-	08EC2

Table 4-22 Voice Grade 7 Service (VG7) (Continued)

N C / N C I C o m b i n a t i o n s		
NC =	**L H - R**	Improved Termination at IC-POT
NC =	**L H C R**	C - Conditioning and Improved Termination at IC-POT
NC =	**L H D R**	Data Capability and Improved Termination at IC-POT
NC =	**L H E R**	C - Conditioning and Data Capability and Improved Termination at IC-POT
NC =	**L H F R**	Improved Termination at IC-POT and Improved Envelope Delay Distortion
NC =	**L H G R**	Improved Termination at IC-POT and Improved Attenuation Distortion
NC =	**L H J R**	Improved Termination at IC-POT and Improved Envelope Delay Distortion and Improved Attenuation Distortion
NC =	**L H M R**	Data Capability and Improved Termination at IC-POT and Improved Attenuation Distortion
NC =	**L H N R**	Data Capability and Improved Termination at IC-POT and Improved Envelope Delay Distortion and Improved Attenuation Distortion
NC =	**L H Q R**	Data Capability and Improved Termination at IC-POT and Improved Envelope Delay Distortion

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2k	04GO2	-	04CS9.10R	2k	04SF2.LO	-	04CS9.10R
2k	04LO2	-	04CS9.10R	2k	04SF2.LS	-	04CS9.10R
2k	04LS2	-	04CS9.10R	2k	06EA2.E	-	04CS9.10R
2k	04NO2	-	04CS9.10R	2k	06EA2.M	-	04CS9.10R
2k	04SF2.EA	-	04CS9.10R	2k	08EB2.E	-	04CS9.10R
2k	04SF2.GO	-	04CS9.10R	2k	08EB2.M	-	04CS9.10R
2k	04SF2.GS	-	04CS9.10R	2k	08EC2	-	04CS9.10R

Table 4-22 Voice Grade 7 Service (VG7) (Continued)

N C / N C I C o m b i n a t i o n s							
NC =	**L H C -**	C - Conditioning					
NC =	**L H D -**	Data Capability					
NC =	**L H E -**	C-Conditioning and Data Capability					
NC =	**L H F -**	Improved Envelope Delay Distortion					
NC =	**L H G -**	Improved Attenuation Distortion					
NC =	**L H J -**	Improved Attenuation Distortion and Improved Envelope Delay Distortion					
NC =	**L H M -**	Data Capability and Improved Attenuation Distortion					
NC =	**L H N -**	Data Capability and Improved Attenuation Distortion and Improved Envelope Delay Distortion					
NC =	**L H Q -**	Data Capability and Improved Envelope Delay Distortion					

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	04EA2.E	2h	04CS9.10R	-	06EA2.M
2h	04CS9.10R	-	04EA2.M	2h	04CS9.10R	-	06EB2.E
2h	04CS9.10R	-	04GS2	2h	04CS9.10R	-	06EB2.M
2h	04CS9.10R	-	04LS2	2h	04CS9.10R	-	08EB2.E
2h	04CS9.10R	-	04NO2	2h	04CS9.10R	-	08EB2.M
2h	04CS9.10R	-	06EA2.E	2h	04CS9.10R	-	08EC2
2k	04GO2	-	04CS9.10R	2k	04SF2.LO	-	04CS9.10R
2k	04LO2	-	04CS9.10R	2k	04SF2.LS	-	04CS9.10R
2k	04LS2	-	04CS9.10R	2k	06EA2.E	-	04CS9.10R
2k	04SF2.EA	-	04CS9.10R	2k	06EA2.M	-	04CS9.10R
2k	04SF2.GO	-	04CS9.10R	2k	08EB2.E	-	04CS9.10R
2k	04SF2.GS	-	04CS9.10R	2k	08EB2.M	-	04CS9.10R
2k	04NO2	-	04CS9.10R	2k	08EC2	-	04CS9.10R

Table 4-23 Voice Grade 8 Service (VG8)

N C / N C I C o m b i n a t i o n s						
NC = **L J - -** No Network Channel Options						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	02LS2	2k	04SF2.EA	-	04CS9.10R
2h	04CS9.10R	-	04EA2.E	2k	06EA2.E	-	04CS9.10R
2h	04CS9.10R	-	04EA2.M	2k	06EA2.M	-	04CS9.10R
2h	04CS9.10R	-	06EA2.E	2k	06EB2.E	-	04CS9.10R
2h	04CS9.10R	-	06EA2.M	2k	06EB2.M	-	04CS9.10R
2h	04CS9.10R	-	06EB2.E	2k	08EC2	-	04CS9.10R
2h	04CS9.10R	-	06EB2.M				
2h	04CS9.10R	-	08EB2.E	2j	04DS9.EA	-	04CS9.10R
2h	04CS9.10R	-	08EB2.M				
2h	04CS9.10R	-	08EC2				

N C / N C I C o m b i n a t i o n s						
NC = **L J C -** C - Conditioning						
NC = **L J F -** Improved Envelope Delay Distortion						
NC = **L J J -** Improved Attenuation Distortion						
NC = **L J J -** Improved Envelope Delay Distortion and Improved Attenuation Distortion						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	02LS2	2h	04CS9.10R	-	06EB2.E
2h	04CS9.10R	-	04EA2.E	2h	04CS9.10R	-	06EB2.M
2h	04CS9.10R	-	04EA2.M	2h	04CS9.10R	-	08EB2.E
2h	04CS9.10R	-	06EA2.E	2h	04CS9.10R	-	08EB2.M
2h	04CS9.10R	-	06EA2.M	2h	04CS9.10R	-	08EC2
2k	04SF2.EA	-	04CS9.10R	2k	06EB2.E	-	04CS9.10R
2k	06EA2.E	-	04CS9.10R	2k	06EB2.M	-	04CS9.10R
2k	06EA2.M	-	04CS9.10R	2k	08EC2	-	04CS9.10R

Table 4-24 Voice Grade 9 Service (VG9)

N C / N C I C o m b i n a t i o n s							
NC =	**L K - -**		No Network Channel Options				
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06EA2.E	2k	04SF2.EA	-	04CS9.10R
2h	04CS9.10R	-	06EA2.M	2k	06EA2.E	-	04CS9.10R
2h	04CS9.10R	-	08EB2.E	2k	06EA2.M	-	04CS9.10R
2h	04CS9.10R	-	08EB2.M	2k	08EB2.E	-	04CS9.10R
2h	04CS9.10R	-	08EC2	2k	08EB2.M	-	04CS9.10R
				2k	08EC2	-	04CS9.10R
2j	04DS9.EA	-	04CS9.10R				
2j	04DS9.NO	-	04CS9.10R				

N C / N C I C o m b i n a t i o n s							
NC =	**L K - L**		Improved Termination at EU-POT				
NC =	**L K C L**		C - Conditioning and Improved Termination at EU-POT				
NC =	**L K F L**		Improved Termination at EU-POT and Improved Envelope Delay Distortion				
NC =	**L K G L**		Improved Termination at EU-POT and Improved Attenuation Distortion				
NC =	**L K J L**		Improved Termination at EU-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion				
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2	2h	04CS9.10R	-	08EB2.E
2h	04CS9.10R	-	06EA2.E	2h	04CS9.10R	-	08EB2.M
2h	04CS9.10R	-	06EA2.M	2h	04CS9.10R	-	08EC2

Table 4-24 Voice Grade 9 Service (VG9) (Continued)

N C / N C I C o m b i n a t i o n s						
NC = **L K - R**	Improved Termination at IC-POT					
NC = **L K C R**	C - Conditioning and Improved Termination at IC-POT					
NC = **L K F R**	Improved Termination at IC-POT and Improved Envelope Delay Distortion					
NC = **L K G R**	Improved Termination at IC-POT and Improved Attenuation Distortion					
NC = **L K J R**	Improved Termination at IC-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion					
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2k	04NO2	-	04CS9.10R	2k	08EB2.E	-	04CS9.10R
2k	04SF2.EA	-	04CS9.10R	2k	08EB2.M	-	04CS9.10R
2k	06EA2.E	-	04CS9.10R	2k	08EC2	-	04CS9.10R
2k	06EA2.M	-	04CS9.10R				

N C / N C I C o m b i n a t i o n s						
NC = **L K C -**	C - Conditioning					
NC = **L K F -**	Improved Envelope Delay Distortion					
NC = **L K G -**	Improved Attenuation Distortion					
NC = **L K J -**	Improved Envelope Delay Distortion and Improved Attenuation Distortion					
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	04NO2				

Table 4-25 Voice Grade 10 Service (VG10)

N C / N C I C o m b i n a t i o n s						
NC = **L N - -** No Network Channel Options						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04DA2	2k	04DB2	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06DA2				
				2j	04DS9.NO	-	04CS9.10R

N C / N C I C o m b i n a t i o n s						
NC = **L N - L** Improved Termination at EU-POT						
NC = **L N C L** C - Conditioning and Improved Termination at EU-POT						
NC = **L N D L** Data Capability and Improved Termination at EU-POT						
NC = **L N E L** C - Conditioning and Data Capability and Improved Termination at EU-POT						
NC = **L N F L** Improved Termination at EU-POT and Improved Envelope Delay Distortion						
NC = **L N G L** Improved Termination at EU-POT and Improved Attenuation Distortion						
NC = **L N J L** Improved Termination at EU-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion						
NC = **L N M L** Data Capability and Improved Termination at EU-POT and Improved Attenuation Distortion						
NC = **L N N L** Data Capability and Improved Termination at EU-POT and Improved Envelope Delay Distortion and Improved Attenuation Distortion						
NC = **L N Q L** Data Capability and Improved Termination at EU-POT and Improved Envelope Delay Distortion						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	04NO2				

Table 4-25 Voice Grade 10 Service (VG10) (Continued)

<table>
<tr><td colspan="3" align="center">N C / N C I   C o m b i n a t i o n s</td></tr>
<tr><td>NC =</td><td>L N - R</td><td>Improved Termination at IC-POT</td></tr>
<tr><td>NC =</td><td>L N C R</td><td>C - Conditioning and Improved Termination at IC-POT</td></tr>
<tr><td>NC =</td><td>L N D R</td><td>Data Capability and Improved Termination at IC-POT</td></tr>
<tr><td>NC =</td><td>L N E R</td><td>C - Conditioning and Data Capability and Improved Termination at IC-POT</td></tr>
<tr><td>NC =</td><td>L N F R</td><td>Improved Termination at IC-POT and Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N G R</td><td>Improved Termination at IC-POT and Improved Attenuation Distortion</td></tr>
<tr><td>NC =</td><td>L N J R</td><td>Improved Termination at IC-POT and Improved Attenuation Distortion and Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N M R</td><td>Data Capability and Improved Termination at IC-POT and Improved Attenuation Distortion</td></tr>
<tr><td>NC =</td><td>L N N R</td><td>Data Capability and Improved Termination at IC-POT & Improved Attenuation Distortion and Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N Q R</td><td>Data Capability and Improved Termination at IC-POT and Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N C -</td><td>C - Conditioning</td></tr>
<tr><td>NC =</td><td>L N D -</td><td>Data Capability</td></tr>
<tr><td>NC =</td><td>L N E -</td><td>C - Conditioning and Data Capability</td></tr>
<tr><td>NC =</td><td>L N F -</td><td>Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N F -</td><td>Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N G -</td><td>Improved Data Capability</td></tr>
<tr><td>NC =</td><td>L N J -</td><td>Improved Envelope Delay Distortion and Improved Attenuation Distortion</td></tr>
<tr><td>NC =</td><td>L N M -</td><td>Data Capability and Improved Attenuation Distortion</td></tr>
<tr><td>NC =</td><td>L N N -</td><td>Data Capability and Improved Attenuation Distortion and Improved Envelope Delay Distortion</td></tr>
<tr><td>NC =</td><td>L N Q -</td><td>Data Capability and Improved Envelope Delay Distortion</td></tr>
</table>

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2k	04DB2	-	04CS9.10R	2k	04NO2	-	04CS9.10R

Table 4-25 Voice Grade 10 Service (VG10) (Continued)

NC/NCI Combinations		
NC = **L N - B**	CO Bridging	
NC = **L N C B**	CO Bridging and C - Conditioning	
NC = **L N D B**	CO Bridging and Data Capability	
NC = **L N E B**	CO Bridging and C-Conditioning and Data Capability	
NC = **L N F B**	CO Bridging and Improved Envelope Delay Distortion	
NC = **L N G B**	CO Bridging and Improved Attenuation Distortion	
NC = **L N J B**	CO Bridging and Improved Attenuation Distortion and Improved Envelope Delay Distortion	
NC = **L N M B**	CO Bridging and Improved Attenuation Distortion and Data Capability	
NC = **L N N B**	CO Bridging and Improved Attenuation Distortion and Improved Envelope Delay Distortion and Data Capability	
NC = **L N Q B**	CO Bridging and Improved Envelope Delay Distortion and Data Capability	

Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
7c	04CS9.10R	-	BRIDGE				

Table 4-26 Voice Grade 32 Service (VG32)

NC/NCI Combinations						
NC = UC - -	No Network Channel Options					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)

Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	02LA2	-	04CS9.10R	2h	04CS9.10R	-	02LS2
2k	02LB2	-	04CS9.10R	2h	04CS9.10R	-	02NO2
2k	02LC2	-	04CS9.10R	2h	04CS9.10R	-	04NO2
2k	02LG2	-	04CS9.10R				
2k	02LO2	-	04CS9.10R	2i	04CS9.10R	-	04DS9.LS
2k	02NO2	-	04CS9.10R	2i	04CS9.10R	-	04DS9.NO
2k	04NO2	-	04CS9.10R				
				2j	04DS9.LO	-	04CS9.10R
				2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations						
NC = UC - B	CO Bridging					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
7c	04CS9.10R	-	02BL2	7c	04CS9.10R	-	04BR2

NC/NCI Combinations						
NC = UCD -	Data Enhancement					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2k	02LA2.DB	-	04CS9.10R	2k	02LG2.DB	-	04CS9.10R
2k	02LB2.DB	-	04CS9.10R	2k	02LO2.DB	-	04CS9.10R
2k	02LC2.DB	-	04CS9.10R				

Table 4-27 Voice Grade 33 Service (VG33)

NC/NCI Combinations						
NC = U D - - No Network Channel Options						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02GS2	2k	02GO2	-	04CS9.10R
2h	04CS9.10R	-	04EA2.E	2k	04EA2.E	-	04CS9.10R
2h	04CS9.10R	-	04EA2.M	2k	04EA2.M	-	04CS9.10R
2h	04CS9.10R	-	04NO2	2k	04NO2	-	04CS9.10R
2h	04CS9.10R	-	06EA2.E	2k	06EA2.E	-	04CS9.10R
2h	04CS9.10R	-	06EA2.M	2k	06EA2.M	-	04CS9.10R
2h	04CS9.10R	-	06EB2.E	2k	06EB2.E	-	04CS9.10R
2h	04CS9.10R	-	06EB2.M	2k	06EB2.M	-	04CS9.10R
2h	04CS9.10R	-	08EB2.E	2k	08EB2.E	-	04CS9.10R
2h	04CS9.10R	-	08EB2.M	2k	08EB2.M	-	04CS9.10R
2i	04CS9.10R	-	04DS9.EA	2j	04DS9.EA	-	04CS9.10R
2i	04CS9.10R	-	04DS9.GS	2j	04DS9.GO	-	04CS9.10R
2i	04CS9.10R	-	04DS9.NO	2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations						
NC = U D D - Data Enhancement						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
2h	04CS9.10R	-	02GS2.MDD	2k	02GO2.MDD	-	04CS9.10R
2h	04CS9.10R	-	04EA2.EDD	2k	04EA2.EDD	-	04CS9.10R
2h	04CS9.10R	-	04EA2.MDD	2k	04EA2.MDD	-	04CS9.10R
2h	04CS9.10R	-	06EA2.EDD	2k	06EA2.EDD	-	04CS9.10R
2h	04CS9.10R	-	06EA2.MDD	2k	06EA2.MDD	-	04CS9.10R
2h	04CS9.10R	-	06EB2.EDD	2k	06EB2.EDD	-	04CS9.10R
2h	04CS9.10R	-	06EB2.MDD	2k	06EB2.MDD	-	04CS9.10R
2h	04CS9.10R	-	08EB2.EDD	2k	08EB2.EDD	-	04CS9.10R
2h	04CS9.10R	-	08EB2.MDD	2k	08EB2.MDD	-	04CS9.10R

Table 4-28 Voice Grade 36 Service (VG36)

NC/NCI Combinations						
NC = U G - - No Network Channel Options						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	02DA2	2k	02DA2	-	04CS9.10R
2h	04CS9.10R	-	04DA2	2k	04DA2	-	04CS9.10R
2h	04CS9.10R	-	06DA2	2k	06DA2	-	04CS9.10R
2i	04CS9.10R	-	04DS9.NO	2j	04DS9.NO	-	04CS9.10R

NC/NCI Combinations						
NC = U G - B CO Bridging						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
7c	04CS9.10R	-	04BR2.CF	7c	04CS9.10R	-	04BR2.SP

NC/NCI Combinations						
NC = U G C - C Conditioning						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
2h	04CS9.10R	-	02DA2.C1	2k	02DA2.C1	-	04CS9.10R
2h	04CS9.10R	-	02DA2.C2	2k	02DA2.C2	-	04CS9.10R
2h	04CS9.10R	-	02DA2.C3	2k	02DA2.C3	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C1	2k	04DA2.C1	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C2	2k	04DA2.C2	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C3	2k	04DA2.C3	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C1	2k	06DA2.C1	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C2	2k	06DA2.C2	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C3	2k	06DA2.C3	-	04CS9.10R

Table 4-28 Voice Grade 36 Service (VG36) (Continued)

NC/NCI Combinations						
NC = **U G D -** D Conditioning						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	02DA2.D1	2k	02DA2.D1	-	04CS9.10R
2h	04CS9.10R	-	04DA2.D1	2k	04DA2.D1	-	04CS9.10R
2h	04CS9.10R	-	06DA2.D1	2k	06DA2.D1	-	04CS9.10R

NC/NCI Combinations						
NC = **U G E -** C - Conditioning and D - Conditioning						
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**-**	**N C I (S E C N C I)**
2h	04CS9.10R	-	02DA2.C11	2k	02DA2.C11	-	04CS9.10R
2h	04CS9.10R	-	02DA2.C21	2k	02DA2.C21	-	04CS9.10R
2h	04CS9.10R	-	02DA2.C41	2k	02DA2.C41	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C11	2k	04DA2.C11	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C21	2k	04DA2.C21	-	04CS9.10R
2h	04CS9.10R	-	04DA2.C41	2k	04DA2.C41	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C11	2k	06DA2.C11	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C21	2k	06DA2.C21	-	04CS9.10R
2h	04CS9.10R	-	06DA2.C41	2k	06DA2.C41	-	04CS9.10R

4.7   U S WEST Frame Relay Service

The U S WEST Frame Relay Service is described in Technical Publication 77372, *Frame Relay Service.* The publication should be consulted for a full description of the service. References to the HC1, HC31, DA4, DA6, and DD31 services may be found in Sections 4.4 and 4.3 respectively.

Two types of channels will be required to use COMMAND A LINK[SM] with Frame Relay. The first is a channel connecting the COMMAND A LINK[SM] DCS to the Frame Relay network. The NC and NCI code combinations for this channel are listed in this section. The second type of channel is used to connect the DCS to the customer. Normal DS3, DS1, or 56 or 64 kbit/s DDS channels would be used. Code combinations for these channels may be found in other sections of this chapter.

Table 4-29 Frame Relay - High Capacity Service 1 and 31 (HC1 and HC31)

NC/NCI Combinations						
NC = HCER Fast Packet, DS1 Channel Service, ANSI T1.403-1989 Extended Superframe, B8ZS						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1b	04CS9.10R	-	04DU9.1SN	1c	04DJ9.1S	-	04CS9.10R
1b	04CS9.10R	-	04DU9.1SX	1c	04DS9.1S	-	04CS9.10R
1b	04CS9.11R	-	04DU9.1SN	1c	04DJ9.1S	-	04CS9.11R
1b	04CS9.11R	-	04DU9.1SX	1c	04DS9.1S	-	04CS9.11R
1b	04CS9.31R	-	04DU9.1SN	1c	04DJ9.1S	-	04CS9.31R
1b	04CS9.31R	-	04DU9.1SX	1c	04DS9.1S	-	04CS9.31R
2c	Digital *	-	04CS9.10R	2c	Digital *	-	04CS9.31R

*   The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate (e.g., 04DS6.44, 02FCF.54, 02RFZ.AF) offered by U S WEST.

Table 4-30 Frame Relay - Digital Access Service 4 (DA4) - 56 kbit/s

NC/NCI Combinations						
NC = **X H - R** Fast Packet, 56.0 kbit/s, Two-point						
Config #	**NCI (NCI)**	**-**	**NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**- NCI (SECNCI)**
2h	04CS9.10R	-	04DU5.56			

Table 4-31 Frame Relay - Digital Access Service 6 (DA6) - 64 kbit/s

NC/NCI Combinations						
NC = **X D - R** Fast Packet, 64.0 kbit/s, Two-point						
Config #	**NCI (NCI)**	**-**	**NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**- NCI (SECNCI)**
2h	04CS9.10R	-	04DU5.64 *			

* This data rate may not be currently available in all jurisdictions.
Formerly used the XE-R NC code.

4.8   Digital Switched Services

The basic concept of Digital Switched Services (DSS) was discussed briefly in
Section 3.5. Figures 3-1 through 3-4 should be consulted for an understanding of the
DSS/COMMAND A LINK^{SM} channels. Further information about DSS may be found in
PUB 77319, *U S WEST Digital Switched Services*.

4.8.1 Basic Service

The NC/NCI combinations for the DS1 channels may be found in Table 4-14. The NC
codes are of the type HC_C and HC_V where the underline represents several
values. Valid NC/NCI code combinations for the voice grade circuits are in
Table 4-32.

Table 4-32 Basic Digital Switched Service - Voice Grade Channels

NC/NCI Combinations					
NC = **U C G F** CO Switching Function, Loop Start, DTMF, 2-Way					
NC = **U C G R** CO Switching Function, Loop Start, DTMF, Terminate Only					
NC = **U C G U** CO Switching Function, Loop Start, Originate Only					
Config #	**NCI (NCI)**	**- NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**- NCI (SECNCI)**
3a	04CS9.10R	- Switch *			

*   U S WEST does not use NCI codes at the switch.

NC/NCI Combinations					
NC = **U D G G** CO Switching Function, Ground Start, DTMF, 2-Way					
NC = **U D G S** CO Switching Function, Ground Start, DTMF, Terminate Only					
NC = **U D G V** CO Switching Function, Ground Start, Originate Only					
Config #	**NCI (NCI)**	**- NCI (SECNCI)**	**Config #**	**NCI (NCI)**	**- NCI (SECNCI)**
3a	04CS9.10R	- Switch *			

*   U S WEST does not use NCI codes at the switch.

4.8.2 Advanced Service

The NC/NCI combinations for the DS1 channels may be found in Tables 4-14 and 4-33. The NC codes are of the type HC_C and HC_D respectively. Valid NC/NCI code combinations for the voice grade circuits are in Table 4-34.

Table 4-33 DS1 Channels for Advanced Digital Switched Services

NC/NCI Combinations					
NC = **H C - D** Superframe, Alternate Mark Inversion, and Direct Digital Connection to a Switch					
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**
4a	04CS9.10R	- Switch *			

*   U S WEST does not use NCI codes at the switch.

NC/NCI Combinations					
NC = **H C D D** ANSI T1.403.1995 Extended Superframe, Alternate Mark Inversion, and Direct Digital Connection to a Switch [†]					
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**
4a	04CS9.10R	- Switch *			

*   U S WEST does not use NCI codes at the switch.

[†]   The ESF option may not be available due to the particular switch limitation in the serving CO.

NC/NCI Combinations					
NC = **H C F D** Non-ANSI Extended Superframe, Alternate Mark Inversion, and Direct Digital Connection to a Switch					
Config #	**N C I (N C I)**	**- N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**
4a	04CS9.10R	- Switch *			

*   U S WEST does not use NCI codes at the switch.

Chapter 5 of PUB 77319 should be consulted for further information about the voice grade trunks.

Table 4-34 Advanced Digital Switched Service - Voice Grade Channels

N C / N C I Combinations						
NC =	**U D G T**	CO Switching Function, DID Trunk				
NC =	**U D G Y**	CO Switching Function, DOD Trunk with Answer Supervision				
NC =	**U D G M**	CO Switching Function, 2-Way DID/DOD Trunk With Answer Supervision				
Config #	**N C I (N C I)**	**-**	**N C I (S E C N C I)**	**Config #**	**N C I (N C I)**	**- N C I (S E C N C I)**
4a	04CS9.10R	-	Switch *			

*   U S WEST does not use NCI codes at the switch.

4.9   Simultaneous Voice Data Service

The U S WEST Simultaneous Voice Data Service (SVDS) is an end-to-end digital data transport service which provides simultaneous voice and full duplex data transmission of up to 19.2 kbit/s over a single, non-loaded subscriber cable pair. This service will operate in conjunction with switched voice services such as POTS, Centrex, etc. The voice channel connects to the subscriber line side of a Class 5 Central Office switch and the derived data channel extends dedicated digital transport on the same cable pair used to deliver switched voice services. Further information about SVDS may be found in PUB 77331, *Simultaneous Voice Data Service (SVDS) (Digital Data Over Voice Technology)*.

COMMAND A LINK^{SM} applies only to the derived data channel of this service. This channel is end-to-end compatible with the U S WEST Digital Data Service. Only the customer end is discussed in this section. Figure 4-2 illustrates the application.
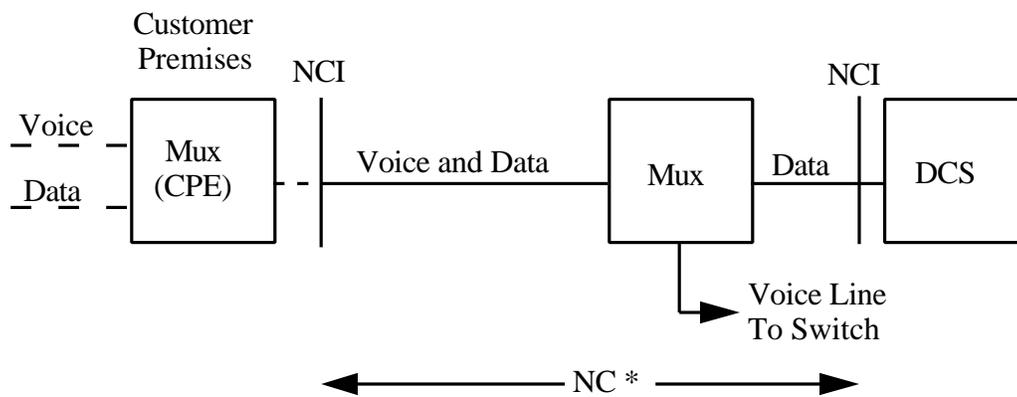
* NC applies to data channel

Figure 4-2 Simultaneous Voice Data Service (SVDS)

Valid SVDS data NC/NCI combinations are listed in Table 4-35.

Table 4-35 Simultaneous Voice Data Service (SVDS)

NC/NCI Combinations					
NC = **X A - C** Two-point 2.4 kbit/s, Customer Reconfigurable					
Config #	NCI (NCI)	- NCI (SECNCI)	Config #	NCI (NCI)	- NCI (SECNCI)
2h	04CS9.10R	- 04DV5.BA			

NC/NCI Combinations					
NC = **X B - C** Two-point 4.8 kbit/s, Customer Reconfigurable					
Config #	NCI (NCI)	- NCI (SECNCI)	Config #	NCI (NCI)	- NCI (SECNCI)
2h	04CS9.10R	- 04DV5.BB			

NC/NCI Combinations					
NC = **X G - C** Two-point 9.6 kbit/s, Customer Reconfigurable					
Config #	NCI (NCI)	- NCI (SECNCI)	Config #	NCI (NCI)	- NCI (SECNCI)
2h	04CS9.10R	- 04DV5.BC			

NC/NCI Combinations					
NC = **X E - C** Two-point 19.2 kbit/s, Customer Reconfigurable					
Config #	NCI (NCI)	- NCI (SECNCI)	Config #	NCI (NCI)	- NCI (SECNCI)
2h	04CS9.10R	- 04DV5.BL			

4.10   U S WEST Self Healing Network Service

U S WEST Self Healing Network Service (SHNS) is described in PUB 77332, *U S WEST Self-Healing Network Service (DS1 & DS3).* The SHNS alternatives available with COMMAND A LINK^SM are limited to DS1 or DS3 interfaces. The standard service is represented by Configuration 22 in Table 4-1. With COMMAND A LINK^SM, the channel is split into two circuits. The first circuit remains a SHNS circuit represented by Configuration 22b or 22c. The second circuit becomes a standard circuit represented by Configurations 1b or 1c.

Central Office multiplexing is also available with SHNS using the NC codes HCPQ and HFPQ. These two are illustrated in Configuration 22a. Applying COMMAND A LINK^SM to the circuit results in a Configuration 22b or 22c (HCPS or HFPS) and a Configuration 10e. The latter is a standard non-SHNS service.

Tables 4-36 through 4-38 contain the applicable NC/NCI code combinations for SHNS.

Table 4-36 Self-Healing Network Service (SHNS) - DS3

NC/NCI Combinations							
NC = **H F P S** DS1 Channel, Premium Service, Self-Healing Network							
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
22b	04DS6.44	-	04CS6.31R	22c	04CS6.31R	-	04DS6.44
22b	04DS6.44	-	04CS6.33R	22c	04CS6.33R	-	04DS6.44
22b	04DS6.44A *	-	04CS6.31R	22c	04CS6.31R	-	04DS6.44A *
22b	04DS6.44A *	-	04CS6.33R	22c	04CS6.33R	-	04DS6.44A *
22b	04DS6.44G *	-	04CS6.31R	22c	04CS6.31R	-	04DS6.44G *
22b	04DS6.44G *	-	04CS6.33R	22c	04CS6.33R	-	04DS6.44G *
22b	04DS6.44N *	-	04CS6.31R	22c	04CS6.31R	-	04DS6.44N *
22b	04DS6.44N *	-	04CS6.33R	22c	04CS6.33R	-	04DS6.44N *
22b	Digital †	-	04CS6.31R	22c	04CS6.31R	-	Digital †
22b	Digital †	-	04CS6.33R	22c	04CS6.33R	-	Digital †

*   These NCI codes represent multiples of the 04DS6.44 interface. This is done for billing and provisioning purposes only and has no technical meaning. See PUB 77324 for further information. The last characters of the codes represent the following values:

    A = 1
    G = 12
    N = 24

†   Digital in this application means that the DS3 channels may be further multiplexed to a higher level to be delivered to the Network Interface.

Table 4-37 Self-Healing Network Service (SHNS) - DS1

NC / NCI Combinations						
NC = H C P S DS1 Channel, Premium Service, Self-Healing Network						
Config #	N C I (N C I)	-	N C I (S E C N C I)	Config #	N C I (N C I)	-	N C I (S E C N C I)
22b	04DS9.15	-	04CS9.10R	22c	04CS9.10R	-	04DU9.BN
22b	04DS9.15B	-	04CS9.10R	22c	04CS9.10R	-	04DU9.BX
22b	04DS9.15K	-	04CS9.10R	22c	04CS9.10R	-	04DU9.CN
22b	04DS9.15S	-	04CS9.10R	22c	04CS9.10R	-	04DU9.CX
22b	04DS9.1K	-	04CS9.10R	22c	04CS9.10R	-	04DU9.DN
22b	04DS9.1S	-	04CS9.10R	22c	04CS9.10R	-	04DU9.DX
22b	04DS9.15	-	04CS9.11R	22c	04CS9.10R		04DU9.SN
22b	04DS9.15B	-	04CS9.11R	22c	04CS9.10R	-	04DU9.SX
22b	04DS9.15K	-	04CS9.11R	22c	04CS9.10R	-	04DU9.1KN
22b	04DS9.15S	-	04CS9.11R	22c	04CS9.10R	-	04DU9.1KX
22b	04DS9.1K	-	04CS9.11R	22c	04CS9.10R	-	04DU9.1SN
22b	04DS9.1S	-	04CS9.11R	22c	04CS9.10R	-	04DU9.1SX
22b	04DS9.15	-	04CS9.31R	22c	04CS9.11R	-	04DU9.BN
22b	04DS9.15B	-	04CS9.31R	22c	04CS9.11R	-	04DU9.BX
22b	04DS9.15K	-	04CS9.31R	22c	04CS9.11R	-	04DU9.CN
22b	04DS9.15S	-	04CS9.31R	22c	04CS9.11R	-	04DU9.CX
22b	04DS9.1K	-	04CS9.31R	22c	04CS9.11R	-	04DU9.DN
22b	04DS9.1S	-	04CS9.31R	22c	04CS9.11R	-	04DU9.DX
22b	Digital [†]	-	04CS9.10R	22c	04CS9.11R	-	04DU9.SN
22b	Digital [†]	-	04CS9.11R	22c	04CS9.11R	-	04DU9.SX
22b	Digital [†]	-	04CS9.31R	22c	04CS9.11R	-	04DU9.1KN
22c	04CS9.10R	-	Digital *	22c	04CS9.11R	-	04DU9.1KX
22c	04CS9.11R	-	Digital *	22c	04CS9.11R	-	04DU9.1SN
22c	04CS9.31R	-	Digital *	22c	04CS9.11R	-	04DU9.1SX
22c	04CS9.31R	-	04DU9.BN	22c	04CS9.31R	-	04DU9.SN
22c	04CS9.31R	-	04DU9.BX	22c	04CS9.31R	-	04DU9.SX
22c	04CS9.31R	-	04DU9.CN	22c	04CS9.31R	-	04DU9.1KN
22c	04CS9.31R	-	04DU9.CX	22c	04CS9.31R	-	04DU9.1KX
22c	04CS9.31R	-	04DU9.DN	22c	04CS9.31R	-	04DU9.1SN
22c	04CS9.31R	-	04DU9.DX	22c	04CS9.31R	-	04DU9.1SX

†   The word "Digital" is used to indicate any NCI code describing a digital interface above the DS1 rate
     offered by U S WEST.

4.11   Self-Healing Alternate Route Protection

Self-Healing Alternate Route Protection is described in PUB 77340, *Self-Healing Alternate Route Protection (SHARP).* SHARP and SHARP PLUS are available with COMMAND A LINK[SM] in the "One-End-Only" configurations. Applying COMMAND A LINK[SM] to an "End-To-End" configuration would split the channel into two "One-End-Only" configurations.

SHARP and SHARP PLUS are available with COMMAND A LINK[SM] at the DS1 (Table 4-38) and DS3 (Table 4-39) level. Interoffice Only protection, also known as "Transport Alternate Path Protection", is available only at the DS3 level.

Higher level customer interfaces are available with SHARP. These would involve the use of CO multiplexing. However, the resulting lower level channels would be identified as standard DS1 or DS3 channels and would not use the SHARP NC codes. See the DS1 or DS3 sections of this chapter for appropriate codes.

Table 4-38 Self-Healing Alternate Route Protection (SHARP) - DS1

NC/NCI Combinations						
NC = H C H A DS1 Self Healing & Disaster Recovery (SHARP): Loop Protection, One End Only.						
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1e	04CS9.10R	-	04DU9.BN	1e	04DS9.15	-	04CS9.10R
1e	04CS9.10R	-	04DU9.BX	1e	04DS9.15	-	04CS9.11R
1e	04CS9.11R	-	04DU9.BN	1e	04DS9.15	-	04CS9.31R
1e	04CS9.11R	-	04DU9.BX	1e	04DS9.15K	-	04CS9.10R
1e	04CS9.31R	-	04DU9.BN	1e	04DS9.15K	-	04CS9.11R
1e	04CS9.31R	-	04DU9.BX	1e	04DS9.15K	-	04CS9.31R
				1e	04DS9.15S	-	04CS9.10R
				1e	04DS9.15S	-	04CS9.11R
				1e	04DS9.15S	-	04CS9.31R
1e	04CS9.10R	-	04DU9.CN	1e	04CS9.10R	-	04DU9.SN
1e	04CS9.10R	-	04DU9.CX	1e	04CS9.10R	-	04DU9.SX
1e	04CS9.11R	-	04DU9.CN	1e	04CS9.11R	-	04DU9.SN
1e	04CS9.11R	-	04DU9.CX	1e	04CS9.11R	-	04DU9.SX
1e	04CS9.31R	-	04DU9.CN	1e	04CS9.31R	-	04DU9.SN
1e	04CS9.31R	-	04DU9.CX	1e	04CS9.31R	-	04DU9.SX

Table 4-38 Self-Healing Alternate Route Protection (SHARP) - DS1 (Continued)

N C / N C I C o m b i n a t i o n s						
NC = **H C H D**	DS1 Self Healing & Disaster Recovery (SHARP): Loop Protection, (One End) and Interoffice Facilities Protection (i.e. Serving Wire Center Protection).					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1g	04CS9.10R	-	04DU9.BN	1g	04DS9.15	-	04CS9.10R
1g	04CS9.10R	-	04DU9.BX	1g	04DS9.15	-	04CS9.11R
1g	04CS9.11R	-	04DU9.BN	1g	04DS9.15	-	04CS9.31R
1g	04CS9.11R	-	04DU9.BX	1g	04DS9.15K	-	04CS9.10R
1g	04CS9.31R	-	04DU9.BN	1g	04DS9.15K	-	04CS9.11R
1g	04CS9.31R	-	04DU9.BX	1g	04DS9.15K	-	04CS9.31R
				1g	04DS9.15S	-	04CS9.10R
				1g	04DS9.15S	-	04CS9.11R
				1g	04DS9.15S	-	04CS9.31R
1g	04CS9.10R	-	04DU9.CN	1g	04CS9.10R	-	04DU9.SN
1g	04CS9.10R	-	04DU9.CX	1g	04CS9.10R	-	04DU9.SX
1g	04CS9.11R	-	04DU9.CN	1g	04CS9.11R	-	04DU9.SN
1g	04CS9.11R	-	04DU9.CX	1g	04CS9.11R	-	04DU9.SX
1g	04CS9.31R	-	04DU9.CN	1g	04CS9.31R	-	04DU9.SN
1g	04CS9.31R	-	04DU9.CX	1g	04CS9.31R	-	04DU9.SX

Table 4-39   Self-Healing Alternate Route Protection (SHARP) - DS3

N C / N C I C o m b i n a t i o n s						
NC = **H F H A**	DS3 Self Healing & Disaster Recovery (SHARP): Loop Protection, (One End) and Interoffice Facilities Protection					
NC = **H F H -**	DS3 Self Healing & Disaster Recovery (SHARP): Loop Protection, (One End) and Interoffice Facilities Protection Including Interoffice Protection (i.e. Serving Wire Center Protection)					
NC = **H F H T**	DS3 Self Healing & Disaster Recovery (SHARP): Interoffice Protection only. (Transport Alternate Path Protection)					
Config #	NCI (NCI)	-	NCI (SECNCI)	Config #	NCI (NCI)	-	NCI (SECNCI)
1g	04CS6.31R	-	04DS6.44	1g	04DS6.44	-	04CS6.31R
1g	04CS6.33R	-	04DS6.44	1g	04DS6.44	-	04CS6.33R

CONTENTS

5.   Customer Controller

5.1   General

The Customer Controller is the device which the customer accesses and uses to control the connections in the Digital Cross-connect System (DCS) or other Intelligent Network Element device.

Network control is provided by the FLEXCOM™/linc software. This software provides the partitioning to separate different customer's networks so that one customer can not access another customer's network. Connections between different customer's networks may be made only by using the Virtual Ports as described in Chapter 2. Virtual ports are permitted only with the two customer's mutual consent.

The FLEXCOM™/linc software provides a menu-driven means of using the Customer Controller and controlling the connections within the DCSs. On-line Help is available to aid in answering questions.

One of the primary functions of the FLEXCOM™/linc software is to convert customer names and commands into the proper syntax for operating the DCS.

5.2   Features

The Customer Controller resides on a highly reliable fault tolerant computer. The design objective of the system is to provide continuous system availability by isolating single failures and corrupted data.

The system has redundant hardware with self-checking components.

The system software supports fault tolerance in both hardware and system software. Automatic multiprocessor load balancing is supported. Additional hardware may be added without disrupting the system.

5.3   Customer Access

There are two methods of accessing the Customer Controller: dial-up and via an attendant.

The dial-up method is available using an analog asynchronous ASCII modem using a terminal or personal computer that can emulate a VT100 terminal. The dial-up data link operates at data rates from 1200 to 9600 baud. Security is maintained by User ID and password protection. The dial-up method is available twenty-four hours a day.

Customers may also have an attendant make needed changes in the network cross-connects. Attendant access is available during normal working hours.

CONTENTS

Chapter and Section   **Page**

6.   Definitions

There are terms used in this document that are not defined in this chapter. It is suggested that the reader go to the Technical Publication about the service being discussed for a better understanding.

6.1   Acronyms

AMI	Alternate Mark Inversion
ANSI	America National Standards Institute
B8ZS	Bipolar with 8 Zero Substitution
CCC	Clear Channel Capability
CO	Central Office
CPE	Customer Provided Equipment
DCS	Digital Cross-Connect System
DDS	Digital Data Service
DID	Direct Inward Dialing
DOD	Direct Outward Dialing
DSS	Digital Switched Service
DS0	Digital Signal Level 0 (64 kbit/s) (1 voice channel)
DS1	Digital Signal Level 1 (1.544 Mbit/s)
DS3	Digital Signal Level 3 (44.736 Mbit/s)
DTMF	Dual Tone Multifrequency Signaling
EU-POT	End-User-Point of Termination
FCC	Federal Communications Commission
FLEXCOM	Flexible Network Control (Formerly FLEX-NET)
IC/IEC	Interexchange Carrier
kbit/s	kilobits per second (1,000 bit/s)
LEC	Local Exchange Carrier
NC	Network Channel
NCI	Network Channel Interface
NI	Network Interface
SHARP	Self-Healing Alternate Route Protection
SHNS	Self-Healing Network Services

SVDS	Simultaneous Voice and Data Service
WATS	Wide Area Telecommunications Service

6.2   Glossary

Alternate Mark Inversion (AMI)

A one (mark) pulse which is the opposite polarity as its predecessor.

American National Standard Institute (ANSI)

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

Bipolar With 8 Zero Substitution (B8ZS)

Bipolar 8 Zero Substitution is an application of BPRZ and is an exception to the Alternate Mark Inversion (AMI) line-code rule. It is one method for providing bit independence for digital transmission by providing a minimum 1s density of 1 in 8 bits.

Bridging (Multipoint Service)

Denotes the process of connecting three or more customer locations.

Carrier

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

Central Office (CO)

A local switching system (or a portion thereof) and it's associated equipment locate 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.

Clear Channel Capability (CCC)

A characteristic of a transmission path in which the bit positions allocated for customer data may represent any combination of zeroes and ones.

Conditioning

Denotes an enhancement to the transmission performance of a voice band channel. Parameter(s) affected are attenuation distortion, envelope delay distortion and noise.

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 interexchange services for hire for others, and (2) End-Users, who request services only for their own use.

Customer Installation (CI)

Equipment and wiring at the customer's location on the customer side of the Network Interface.

Customer Interface

The interface with a customer at a point of termination.

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. In the U S WEST Digital Data Service application, CPE typically includes the DSU (CSU/DSU) and data terminal equipment which are connected to the channel.

Data Enhancement (End-Link, Mid-Link Applications)

This option provides improved attenuation distortion requirements and establishes limits for envelope delay distortion, phase jitter, and intermodulation distortion.

Digital Cross-Connect System (DCS)

An intelligent (processor controlled) digital terminal that provides the capability to perform electronic cross-connects on digital channels operating at or below the bit rate of the transport systems terminated on the unit. This unit may also provide other features, e.g., bridging.

Digital Hierarchy Level

The level in the digital hierarchy. The levels and the respective bit rates are:

Level	Bit Rate	Level	Bit Rate
DS0	64.0 kbit/s	DS3	44.736 Mbit/s
DS1	1.544 Mbit/s	DS4NA	139.264 Mbit/s
DS1C	3.152 Mbit/s	DS4	274.176 Mbit/s
DS2	6.312 Mbit/s		

DS1 Clear Channel

Denotes that 1.535 Mbit/s of a 1.544 Mbit/s DS1 facility are available for customer information. The remaining 8 kilobits, or overhead, are for error correction, framing, and network performance/status/information.

Dual tone Multifrequency Signaling (DTMF)

A signaling method that employs signals consisting of two sinusoidal voice frequency components, one from a group of four low frequencies and the other from a group of four high frequencies.

E&M Signaling Arrangements

Denotes a method of transmitting supervisory information between a switching machine or an End-User and a signaling system.

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.)

End-User POT (EU-POT)

The Network Interface at the End-User's premises at which U S WEST Communication, Inc.'s responsibility for the provision of service ends.

Equal Level Echo Path Loss (ELEPL)

The measure of echo path loss at a 4-Wire interface which is corrected by the difference between the transmit and receive Transmission Level Points (TLPs).

$$ELEPL = TLP_{transmit} + TLP_{receive}$$

Equalization

The process of correcting frequency and/or phase distortion of a circuit by the introduction of networks to compensate for the difference in attenuation and or time delay at the various frequencies in the transmission band.

Error Correction - DDS

Error correction is a technique used with "dataport" provisioning methods to improve transmission quality. The subrate DS0-A dataport signal contains multiple copies which are used to employ a "voting" scheme to minimize errors. the use of error correction above the 19.2 kbit/s rate requires a second DS0 channel.

Extended Superframe (ESF) Format

An Extended Superframe consists of twenty-four consecutive DS1 frames. Bit one of each frame (the F-bit) is time shared during the 24 frames to describe a 6 bit frame pattern, a 6 bit Cyclic Redundancy Check (CRC) remainder, and a 12 bit data link. The transfer rate of each is 2 kbit/s, 2 kbit/s, and 4 kbit/s respectively.

Feature Group (FG)

A feature Group defines for Switched Access Service the type of connection to a U S WEST switching system (i.e., line side or trunk side) and the access calling pattern (e.g., 950-0XXX, 10XXX, NXX-XXXX).

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

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

Line-Side Connection

Denotes a connection of a transmission path to the dial tone side of a switching system.

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)

The regulated entity providing Access and Intra-LATA services.

Loop Signaling

Loop signaling uses a DC path, or loop, to convey address and supervisory signaling information.

Multiplexer (Mux)

An equipment unit to multiplex, or do multiplexing: Multiplexing is a technique of modulating (analog) or interleaving (digital) multiple, relatively narrow bandwidth channels into a single channel having a wider bandwidth (analog) or higher bit-rate (digital). the term Multiplexer implies the demultiplexing function is present to reverse the process so it is not usually stated.

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 (TLPs). (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.

Packet

A unit of data, consisting of binary digits including data and call-control signals, that is switched and transmitted as a composite whole.

Packet Switched Network

A switched network which provides connection for forwarding standard data packets between user parties.

Port

A place at which energy or signals enter or leave a device, circuit, etc.

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.

Point of Termination (POT)

The physical telecommunications interface that establishes the technical interface, the test point(s) and the point(s) of operational responsibility. (See Network Interface).

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).]

Serving Wire Center

The term "Serving Wire Center" denotes a U S WEST Central Office from which dial tone for the local Exchange Service would normally be provided to the demarcation point on the property at which the customer is served.

Signaling

The transmission of information to establish, monitor, or release connections and/or provide Network Control.

Single Frequency Signaling (SF)

The use of a voice frequency tone (between 300 and 3300 Hz), keyed on and off, to transport dial pulse signaling, on-hook and off-hook supervision, or a combination of signaling and supervision over a carrier channel or 4-wire metallic facility.

Superframe Format (SF)

A superframe consists of 12 consecutive DS1 frames. Bit one of each frame (the F-bit) is used to describe a 12-bit framing pattern during the 12 frames.

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.

Trunk

A communications path connecting two switching systems in a network, used in the establishment of an end-to-end connection.

Voice Grade (VG)

A term used to describe a channel, circuit, facility or service that is suitable for the transmission of speech, digital or analog data or facsimile, generally with a frequency range of about 300 to 3000 Hz.

Wire Center

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

CONTENTS

7.   References

The documents listed in this section were either specifically referenced in this document or may be encountered while designing a COMMAND A LINK^{SM} network. Later editions of these documents may be available.

7.1   American National Standards Institute Documents

ANSI T1.102-1993   *American National Standard for Telecommunications - Digital Hierarchy - Electrical Interfaces.*

ANSI T1.107-1995   *American National Standard for Telecommunications - Digital Hierarchy - Formats Specifications.*

ANSI 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.*

ANSI T1.403-1995   *American National Standard for Telecommunications - Carrier-to-Customer Installation - DS1 Metallic Interface.*

ANSI T1.404-1994   *American National Standard for Telecommunications - Carrier-to-Customer Installation - DS3 metallic Interface Specification.*

7.2   U S WEST Technical Publications

PUB 77200   *U S WEST DS1 Service -and U S WEST DS1 Rate Synchronization Service, Network Channel and Network Channel Interface Code Combinations.* Issue D, October, 1995.

PUB 77204   *U S WEST Digital Data Service, Product Description, Applications, and Interface Combinations.* Issue C, April, 1997.

PUB 77310   *Private Line Voice Grade Analog Channels For Access Service.* Issue A, April, 1997.

PUB 77311   *Analog Channels For Non-Access Service.* Issue C, March, 1993.

PUB 77312   *U S WEST Digital Data Service, Technical Description,*   Issue E, April, 1997.

PUB 77319   *U S WEST Digital Switched Services.* Issue C, June, 1996.

PUB 77324   *U S WEST DS3 Service.* Issue C, April, 1993.

PUB 77331   *Simultaneous Voice Data Service (SVDS) (Digital Data Over Voice Technology).* Issue D, July, 1995.

PUB 77332   *U S WEST Self Healing Network Service (SHNS) (DS1, DS3, OC3, & OC12).* Issue I, March, 1997.

PUB 77340   *Self-Healing Alternate Route Protection (SHARP).* Issue E, June, 1994.

PUB 77344   *U S WEST Diversity and Avoidance.* Issue A, November, 1990.

PUB 77359   *U S WEST DIGIPAC® Service Interface Specifications for Public Packet Switching Network.* Issue E, May, 1994.

PUB 77372   *Frame Relay Service.* Issue E, March, 1997.

PUB 77375   *1.544 Mbit/s Channel Interfaces - Technical Specifications for Network Channel Interface Codes Describing Electrical Interfaces at Customer Premises and as USWC Central Offices.* Issue D, October, 1995.

PUB 77386   *Expanded Interconnection and Collocation for Private Line Transport and Switched Access Services.* Issue B, April, 1997.

7.3   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 U S WEST employees may order;

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