ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes

9.1 Local Transport Interface Groups

Ten Interface Groups are provided for terminating the Local Transport at the customer's premises. Each Interface Group provides a specified premises interface code (e.g., two-wire, four-wire, DS1, etc.). At the option of the customer and where transmission facilities permit, the individual transmission path between the customer's premises and the first point of switching may be provided with optional features as set forth in 6.3.1 preceding.

As a result of the customer's access order and the type of Telephone Company transport facilities serving the customer's premises, the need for signaling conversions or two-wire to four-wire conversions, or the need to terminate digital or high frequency facilities in channel bank equipment may require that Telephone Company equipment be placed at the customer's premises. For example, if a voice frequency interface is ordered by the customer and the Telephone Company facilities serving the customers premises are digital, then Telephone Company channel bank equipment must be placed at the customer's premises in order to provide the voice frequency interface ordered by the customer.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.1 Local Transport Interface Groups (Cont'd)

Interface Group 1 is provided with Type C Transmission Specifications, and Interface Groups 2 through 10 are provided with Type A or B Transmission Specifications, depending on the Feature Group or Basic Serving Arrangement and whether the Access Service is routed directly or through an access tandem. All Interface Groups are provided with Data Transmission Parameters.

Only certain premises interfaces are available at the customer's premises. The premises interfaces codes associated with the Interface Groups may vary among Feature Groups and Basic Serving Arrangements. The various premises interfaces codes which are available with the Interface Groups or Basic Serving Arrangements, and the Feature Groups with which they may be used, are set forth in 9.1.11 following.

For each of the ten Interface Groups described following, the transmission path between the point of termination at the customer's premises and the first point of switching may be comprised of any form or configuration of plant and equipment capable of and typically used in the telecommunications industry for the transmission of voice and associated telephone signals within the frequency bandwidth of 300 to 3000 Hz.

9.1.1 Interface Group 1 (USOC TPP1X)

Interface Group 1 provides a two-wire voice frequency transmission path at the point of termination at the customer's premises. Interface Group 1 is not provided in association with FGD and BSA-D when the first point of switching is an access tandem. In addition, Interface Group 1 is not provided in association with FGB, FGD. BSA-B or BSA-D when the first point of switching can only provide four-wire terminations. (D) (D)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.1 Local Transport Interface Groups (Cont'd)

9.1.1 Interface Group 1 (USOC TTP1X) (Cont'd)

The interface is provided with loop supervisory signaling. When the interface is associated with FGA or BSA-A, such signaling will be loop start or ground start signaling. When the interface is associated with FGB, FGD, BSA-B or BSA-D, such signaling will be reverse battery signaling. When FGB, FGD, BSA-B, or BSA-D access service is associated with a two-way calling interface, E&M signaling shall be used. (D) (D)

9.1.2 Interface Group 2 (USOC TTP2X)

Interface Group 2 provides four-wire voice frequency transmission at the point of termination at the customer's premises. The interface is provided with loop supervisory signaling. When the interface is associated with FGA or BSA-A, such signaling will be loop start or ground start signaling. When the interface is associated with FGB, FGD, BSA-B or BSA-D such signaling, except for two-way calling which is E&M signaling, will be reverse battery signaling. (D) (D)

9.1.3 Reserved for Future Use

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.1 **Local Transport Interface Groups** (Cont'd)

9.1.4 **Reserved for Future Use** (C)

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9.1.5 **Reserved for Future Use** (C)

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ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.1 Local Transport Interface Groups (Cont'd)

9.1.6 Interface Group 6 (USOC TPP6X)

Interface Group 6 provides DS1 level digital transmission at the point of termination at the customer's premises. The interface is capable of transmitting electrical signals at a nominal 1.544 Mbps, with the capability to channelize up to 24 voice frequency transmission paths. Before the first point of switching, when analog switching utilizing analog terminations is provided, the Telephone Company will provide multiplex and channel bank equipment to derive 24 transmission paths with a frequency bandwidth of approximately 300 to 3000 Hz. When digital switching or analog switching with digital carrier terminations is provided, the Telephone Company will provide, at the first point of switching, a DS1 signal in D3/D4 format.

The interface is provided with bit stream supervisory signaling for each individual transmission channel.

9.1.7 Reserved for Future Use (C)

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ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.1. **Local Transport Interface Groups** (Cont'd)

9.1.8 **(Reserved for Future Use)** (C)

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9.1.9 **Interface Group 9** (USOC TPP9X)

Interface Group 9 provides DS3 level digital transmission at the point of termination at the customer's premises. The interface is capable of transmitting electrical signals at a nominal 44.736 Mbps, with the capability to channelize up to 672 voice frequency transmission paths. Before the first point of switching, when analog switching utilizing analog terminations is provided, the Telephone Company will provide multiplex and channel bank equipment to derive up to 672 transmission paths with a frequency bandwidth of approximately 300 to 3000 Hz. When digital switching, or analog switching with digital carrier terminations is provided, the Telephone Company will provide, at the first point of switching, DS1 signals in D3/D4 format.

The interface is provided with bit stream supervisory signaling for each individual transmission channel.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.1 Local Transport Interface Groups (Cont'd)

9.1.10 (Reserved for Future Use) (C)

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9.1.11 Available Premises Interface Codes

Following is a matrix showing which premises interface codes are available for each Interface Group as a function of the Telephone Company switch supervisory signaling and Feature Group. For explanations of these codes, see the Glossary of Channel Interface Codes in 9.3.1 following.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.1 **Local Transport Interface Groups** (Cont'd)

9.1.11 **Available Premises Interface Codes** (Cont'd)

Interface Group	Telephone Company Switch Supervisory Signaling	Premises Interface Code	Feature Group A	B	D	
1	LO	2LS2	X			
	LO	2LS3	X			
	GO	2GS2	X			
	GO	2GS3	X			
	LO, GO	2DX3	X			
	LO, GO	4EA3-E	X			
	LO, GO	4EA3-M	X			
	LO, GO	6EB3-E	X			
	LO, GO	6EB3-M	X			
	RV, EA, EB, EC	2DX3		X	X	(D)
	RV, EA, EB, EC	4EA3-E		X	X	|
	RV, EA, EB, EC	4EA3-M		X	X	|
	RV, EA, EB, EC	6EB3-E		X	X	|
	RV, EA, EB, EC	6EB3-M		X	X	|
	EA, EB, EC	6EC3			X	|
	RV	2RV3-O		X	X	|
	RV	2RV3-T		X	X	(D)
2	LO, GO	4SF2	X			
	LO, GO	4SF3	X			
	LO	4LS2	X			
	LO	4LS3	X			
	LO	6LS2	X			
	GO	4GS2	X			
	GO	4GS3	X			
	GO	6GS2	X			
	LO, GO	4DX2	X			
	LO, GO	4DX3	X			
	LO, GO	6EA2-E	X			
	LO, GO	6EA2-M	X			
	LO, GO	8EB2-E	X			
	LO, GO	8EB2-M	X			
	LO, GO	6EX2-B	X			

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.1 Local Transport Interface Groups (Cont'd)

9.1.11 Available Premises Interface Codes (Cont'd)

Interface Group	Telephone Company Switch Supervisory Signaling	Premises Interface Code	Feature Group A	B	D	
2(Cont'd)	RV, EA, EB, EC	4SF2		X	X	(D)
	RV, EA, EB, EC	4SF3		X		|
	RV, EA, EB, EC	4DX2		X	X	|
	RV, EA, EB, EC	4DX3		X	X	|
	RV, EA, EB, EC	6DX2				|
	RV, EA, EB, EC	6EA2-E		X	X	|
	RV, EA, EB, EC	6EA2-M		X	X	|
	RV, EA, EB, EC	8EB2-E		X	X	|
	RV, EA, EB, EC	8EB2-M		X	X	|
	EA, EB, EC	8EC2-M			X	|
	RV	4RV2-O		X	X	|
	RV	4RV2-T		X	X	|
	RV	4RV3-O		X		|
	RV	4RV3-T		X		(D)
6	LO, GO	4DS9-15	X			
	LO, GO	4DS9-15L	X			
	RV, EA, EB, EC	4DS9-15		X	X	(D)
	RV, EA, EB, EC	4DS9-15L		X	X	(D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.1 **Local Transport Interface Groups** (Cont'd)

9.1.11 **Available Premises Interface Codes** (Cont'd)

Interface Group	Telephone Company Switch Supervisory Signaling	Premises Interface Code	Feature Group A	B	D	
8	LO, GO	4DSO-63	X			
	LO, GO	4DSO-63L	X			
	RV, EA, EB, EC	4DSO-63		X	X	(D)
	RV, EA, EB, EC	4DSO-63L		X	X	(D)
9	LO, GO	4DS6-44	X			
	LO, GO	4DS6-44L	X			
	RV, EA, EB, EC	4DS6-44		X	X	(D)
	RV, EA, EB, EC	4DS6-44L		X	X	(D)
10	LO, GO	4DS6-27	X			
	LO, GO	4DS6-27L	X			
	RV, EA, EB, EC	4DS6-27		X	X	(D)
	RV, EA, EB, EC	4DS6-27L		X	X	(D)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service

The Telephone Company will maintain existing transmission specifications on functioning service configurations installed prior to the effective date of this tariff except that service configurations having performance specifications exceeding the standards listed in this provision will be maintained at performance levels specified in this tariff.

The transmission specifications contained in this Section are immediate action limits. Acceptance limits are set forth in Technical Reference GR-334-CORE, Issue 1. This Technical Reference also provides the basis for determining (C)(x) Switched Access Service maintenance limits.

9.2.1 Standard Transmission Specifications

Following are descriptions of the three Standard Transmission Specifications available with Switched Access Services. The specific applications in terms of the Switched Access Arrangements and Interface Groups with which the Switched Access Arrangement Standard Transmission Specifications are provided are set forth in 6.2 preceding.

(A) Type A Transmission Specifications

Type A Transmission Specifications is provided with the following parameters:

(1) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is ± 2.0 dB.

(x) GR-334-CORE, Issue 1, replaces TR-NPL-000334 in its entirety.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.1 Standard Transmission Specifications (Cont'd)

(A) Type A Transmission Specifications (Cont'd)

(2) Attenuation Distortion

The maximum Attenuation Distortion in the 404 to 2804 Hz frequency band relative to the loss 1004 Hz is -1.0 dB to +3.0 dB.

(3) C-Message Noise

The maximum C-Message Noise for the transmission path at the route miles listed is less than or equal to:

Route Miles	C-Message Noise
less than 50	32 dBrnCO
51 to 100	34 dBrnCO
101 to 200	37 dBrnCO
201 to 400	40 dBrnCO
401 to 1000	42 dBrnCO

(4) C-Notch Noise

The maximum C-Notch Noise, utilizing a -16 dBmO holding tone, is less than or equal to 45 dBrnCO.

(5) Echo Control

Echo Control, identified as Equal Level Echo Path Loss, and expressed as Echo Return Loss and Singing Return Loss, is dependent on the routing, i.e., whether the service is routed directly from the customer's point of termination (POT) to the end office or via an access tandem. It is equal to or greater than the following:

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.1 Standard Transmission Specifications (Cont'd)

(A) Type A Transmission Specifications (Cont'd)

(5) Echo Control (Cont'd)

	Echo Return Loss	Singing Return Loss
POT to Access Tandem	21 dB	14 dB
POT to End Office		
- Direct	N/A	N/A
- Via Access Tandem	16 dB	11 dB

(6) Standard Return Loss

Standard Return Loss expressed as Echo Return Loss and Singing Return Loss on two-wire ports of a four-wire point of termination shall be equal to or greater than:

Echo Return Loss	Singing Return Loss
5 dB	2.5 dB

(B) Type B Transmission Specifications

Type B Transmission Specifications is provided with the following parameters:

(1) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is± 2.5 dB.

(2) Attenuation Distortion

The maximum Attenuation Distortion is the 404 to 2804 Hz frequency band relative to loss at 1004 Hz is -2.0 dB to +4.0 dB.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.1 Standard Transmission Specifications (Cont'd)

(B) **Type B Transmission Specifications** (Cont'd)

(3) **C-Message Noise**

The maximum C-Message Noise for the transmission path at the route miles listed is less than or equal to:

	C-Message Noise *	
Route Miles	Type B1	Type B2
less than 5	32 dBrnCO	35 dBrnCO
51 to 100	33 dBrnCO	37 dBrnCO
101 to 200	35 dBrnCO	40 dBrnCO
201 to 400	37 dBrnCO	43 dBrnCO
401 to 1000	39 dBrnCO	45 dBrnCO

(4) C-Notch Noise

The maximum C-Notch Noise, utilizing a -16 dBmO holding tone is less than or equal to 47 dBrnCO.

(5) Echo Control

Echo Control, identified as Impedance Balance for FGA, FGB, BSA-A and BSA-B and Equal Level Echo Path Loss for FGD and BSA-D and expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), is dependent on the routing, i.e., whether the service is routed directly from the customer's point of termination (POT) to the end office or via an access tandem. The ERL and SRL also differ by Switched Access Service, type of termination, and type of transmission path. They are greater than or equal to the following: (D)

* For FGD and BSA-D only Type B2 will be provided. For FGA, FGB, BSA-A and BSA-B, Type B1 or B2 will be provided as set forth in Technical Reference GR-334-CORE, Issue 1. (D)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.1 Standard Transmission Specifications (Cont'd)

(B) Type B Transmission Specifications (Cont'd)

(5) Echo Control (Cont'd)

	Echo Return Loss	Singing Return Loss
POT to Access Tandem - Terminated in 4-Wire trunk	21 dB	14 dB
POT to End Office - Terminated in 2-Wire trunk	16 dB	11 dB
POT to End Office - Direct	16 dB	11 dB
-Via Access Tandem ▪ For FGB and BSA-B access	8 dB	4 dB

(D)

(D)

(6) Standard Return Loss

Standard Return Loss, expressed as Echo Return Loss and Singing return Loss, on two-wire ports of a four-wire point of termination shall be equal to or greater than:

Echo Return Loss	Singing Return Loss
5 dB	2.5 dB

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.1 Standard Transmission Specifications (Cont'd)

(C) Type C Transmission Specification

Type C Transmission Specifications is provided with the following parameters:

(1) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is ± 3.0 dB.

(2) Attenuation Distortion

The maximum Attenuation Distortion in the 404 to 2804 Hz frequency band relative to loss at 1004 Hz is -2.0 dB to +5.5 dB.

(3) C-Message Noise

The maximum C-Message Noise for the transmission path at the route miles listed is less than or equal to:

	C-Message Noise*	
Route Miles	Type B1	Type B2
less than 50	32 dBrnCO	38 dBrnCO
51 to 100	33 dBrnCO	39 dBrnCO
101 to 200	35 dBrnCO	41 dBrnCO
201 to 400	37 dBrnCO	43 dBrnCO
401 to 1000	39 dBrnCO	45 dBrnCO

(4) C-Notch Noise

The maximum C-Notch Noise, utilizing a -16 dBmO holding tone is less than or equal to 47 dBrnCO.

* For FGD and BSA-D only Type C2 will be provided. For FGA, FGB, BSA-A and BSA-B, Type C1 or C2 will be provided set forth in Technical Reference GR-334-CORE, Issue 1. (D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications, and Channel Codes** (Cont'd)

9.2 **Transmission Specifications for Switched Access Service** (Cont'd)

9.2.1 **Standard Transmission Specifications** (Cont'd)

(C) Type C Transmission Specifications (Cont'd)

(5) Echo Control

Echo Control, identified as Return Loss and expressed as Echo Return Loss and Singing Return Loss is dependent on the routing, i.e., whether the service is routed directly from the customer's point of termination (POT) to the end office or via an access tandem. It is equal to or greater than the following:

	Echo Return Loss	Singing Return Loss
POT to Access Tandem	13 dB	6 dB
POT to End Office		
- Direct	13 dB	6 dB
- Via Access Tandem (for FGB and BSA-B only)	8 dB	4 dB

ACCESS SERVICE

9. Interface Groups, Transmission Specifications, and Channel Codes (Cont'd)

9.2 Transmission Specifications for Switched Access Service (Cont'd)

9.2.2 Data Transmission Parameters

Two types of Data Transmission Parameters, i.e., Type DA and Type DB, are provided for the Switched Access Service arrangements. The specific applications in terms of the Feature Groups with which they are provided are set forth in 6.2 preceding. In addition, the Combined Access Service Arrangement is provided with Data Transmission Parameters. Following are descriptions of each parameter.

(A) Data Transmission Parameters Type DA

(1) Signal to C-Notched Noise Ratio

The Signal to C-Notched Noise Ratio is equal to or greater than 33 dB.

(2) Envelope Delay Distortion

The maximum envelope Delay Distortion for the frequency bands and route miles specified is:

	604 to 2804 Hz
less than 30 route miles	500 microseconds
equal to or greater than 30 route miles	900 microseconds

	1004 to 2404 Hz
less than 50 route miles	200 microseconds
equal to or greater than 50 route miles	400 microseconds

(3) Impulse Noise Counts

The Impulse Noise Counts exceeding a 65 dBrnCO threshold in 15 minutes is no more than 15 counts.

(4) Intermodulation Distortion

The Second Order (R2) and Third Order (R3) Intermodulation Distortion products are equal to or greater than:

Second Order (R2)	33 dB
Third Order (R3)	37 dB

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications, and Channel Codes** (Cont'd)

9.2 **Transmission Specifications for Switched Access Service** (Cont'd)

9.2.2 **Data Transmission Parameters** (Cont'd)

(A) Data Transmission Parameters Type DA (Cont'd)

(5) Phase Jitter

The Phase Jitter over the 4-300 Hz frequency band is less than or equal to 5° peak-to-peak.

(6) Frequency Shift

The maximum Frequency Shift does not exceed -2 to +2 Hz.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications, and Channel Codes** (Cont'd)

9.2 **Transmission Specifications for Switched Access Service** (Cont'd)

9.2.2 **Data Transmission Parameters** (Cont'd)

(B) Data Transmission Parameters Type DB

(1) Signal to C-Notched Noise Ratio

The signal to C-Notched Noise Ratio is equal to or greater than 30 dB.

(2) Envelope Delay Distortion

The maximum Envelope Delay Distortion for the frequency bands and route miles specified is:

	604 to 2804 Hz
less than 50 route miles	800 microseconds
equal to or greater than 50 route miles	1000 microseconds

	1004 to 2404 Hz
less than 50 route miles	320 microseconds
equal to or greater than 50 route miles	500 microseconds

(3) Impulse Noise Counts

The Impulse Noise Counts exceeding a 67 dBrnCO threshold in 15 minutes is no more than 15 counts.

(4) Intermodulation Distortion

The Second Order (R2) and Third Order (R3) Intermodulation Distortion products are equal to or greater than:

Second Order (R2)	31 dB
Third Order (R3)	34 dB

(5) Phase Jitter

The Phase Jitter over the 4-300 Hz frequency band is less than or equal to 7° peak-to-peak.

(6) Frequency Shift

The maximum frequency Shift does not exceed -2 to +2 Hz.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes

This section explains the Channel Interface codes and Network Channel codes that the customer must specify when ordering Special Access Service. Included is an example which explains the specific characters of the code, a glossary of Channel Interface codes, impedance levels, Network Channel codes and compatible Channel Interfaces.

Example: If the customer specifies a NT Network Channel Code and a 2DS8-3 Channel Interface at the customer's premises, the following is being requested:

NT =	Metallic Circuit with a Predefined Technical Specification Package (1)
2 =	Number of physical wires at customer premises
DS =	Facility interface for direct current or voltage
8 =	Variable impedance level
3 =	Metallic facilities (DC continuity) for direct current/low frequency control signals or slow speed data (30 baud)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.1 Glossary of Channel Interface Codes and Options

Code	Option	Definition	
			(D)
			(D)
AC -		accepts 20 Hz ringing signal at customer's end user's point of termination	
CT -		Centrex Tie Trunk Termination	
DA -		data stream in VF frequency band at customer's end user's point of termination	
			(D)
			|
			(D)
-	1	monitoring interface with series RC combination (McCulloh format)	
-	2	Telephone Company energized alarm channel	
DD -		DATAPHONE Select-A-Station (and TABS) interface at customer's point of termination	
DE -		DATAPHONE Select-A-Station (and TABS) interface at the customer's end user's point of termination	
DS -		digital hierarchy interface	
-	15	1.544 Mbps (DS1) format per PUB 41451 plus D4	
-	15E	8-bit PCM encoded in one 64 kbps of the DS1 signal	
-	15F	8-bit PCM encoded in two 64 kbps of the DS1 signal	
-	15G	8-bit PCM encoded in three 64 kbps of the DS1 signal	
-	15H	14/11-bit PCM encoded in six 64 kbps of the DS1 signal	
-	15J	1.544 Mbps format per PUB 41451	

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.1 Glossary of Channel Interface Codes and Options (Cont'd)

Code	Option	Definition	
DS (Cont'd)			
-	15K	1.544 Mbps format per PUB 41451 plus extended framing format	(D)
-	15L	1.544 Mbps (DS1) with SF signaling	(D)
-	44	44.736 Mbps (DS3)	
-	44L	44.736 Mbps (DS3) with SF signaling	(D)
DU -		digital access interface	(D)
-	19	19.2 kbps	
-	24	2.4 kbps	
-	48	4.8 kbps	
-	56	56.0 kbps	
-	64	64 kbps	
-	96	9.6 kbps	
-	A	1.544 Mbps format per PUB 41451	
-	B	1.544 Mbps format per PUB 41451 plus D4	
-	C	1.544 Mbps format per PUB 41451 plus extended framing format	(D)
DY -		duplex signaling interface at customer's end user's point of termination	(D)
EA -		E type I E&M Lead Signaling. Customer's end user at POT originates on E Lead.	(D)
EA -	M	Type I E&M Lead Signaling. Customer's end user at POT originates on M Lead.	
EB -		E Type II E&M Lead Signaling. Customer's end user at POT originates on E Lead.	(D)
EB -	M	Type II E&M Lead Signaling. Customer's end user at POT originates on M Lead.	(D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.1 **Glossary of Channel Interface Codes and Options** (Cont'd)

Code	Option	Definition
EC -		Type III E&M signaling at customer POT
EX -	A	tandem channel unit signaling for loop start or ground start and customer supplies open end (dial tone, etc.) functions.
EX -	B	tandem channel unit signaling for loop start or ground start and customer supplies closed end (dial pulsing,etc.) functions.
GO -		ground start loop signaling - open end function by customer or customer's end user.
GS -		ground start loop signaling - closed end function by customer or customer's end user
IA -		E.I.A. (25 pin RS-232)
LA -		end user loop start loop signaling - Type A OPS registered port open end
LB -		end user loop start loop signaling - Type B OPS registered port open end
LC -		end user loop start loop signaling - Type C OPS registered port open end
LO -		loop start loop signaling - open end function by customer or customer's end user
LR -		20 Hz automatic ringdown interface at customer with Telephone Company provided PLAR
LS -		loop start loop signaling - closed end function by customer or customer's end user
NO -		no signaling interface, transmission only

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ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.1 Glossary of Channel Interface Codes and Options (Cont'd)

Code	Option	Definition
PR		protective relaying*
RV -	O	reverse battery signaling, one way operation, originate by customer
	-T	reverse battery signaling, one way operation, terminate function by customer or customer's end user
SF -		single frequency signaling with VF band at either customer POT or customer's end user POT
TF -		telephotograph interface

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* Available only for the transmission of audio tone protective relaying signals used in the protection of electric power systems during fault conditions.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

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Certain material previously found on this page can now be found on 2nd Revised Page 9-25.

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.2 Impedance

The nominal reference impedance with which the channel will be terminated for the purpose of evaluating transmission performance:

Value (ohms)	Code(s)
110	0
150	1
600	2
900	3+
135	5
75	6
124	7
Variable	8
100	9

\+ For those interface codes with a 4-wire transmission path at the customer's POT, rather than a standard 900 ohm impedance the code (3) denotes a customer provided transmission equipment termination. Such terminations were provided to customers in accordance with the F.C.C. Docket No. 20099 Settlement Agreement.

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9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.3 Digital Hierarchy Channel Interface Codes (4DS)

Customers selecting the multiplexed four-wire DSX-1 or higher facility interface option at the customer designated premises will be requested to provide subsequent system and channel assignment data. The various digital bit rates in the digital hierarchy employ the channel interface code 4DS8, 4DS0 or 4DS6 plus the speed options indicated below:

Interface Code and Speed Option	Nominal Bit Rate (Mbps)	Digital Hierarchy Level	
4DS8-15	1.544	DS1	(D)
4DS6-44	44.736	DS3	(D)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.4 Service Designator/Network Channel Code Conversion Table

The purpose of this table is to show the relationship between the service designator codes (e.g. VGC, VG1, etc.) and the network channel codes that are used for various administrative purposes.

Service Designator Code	Network Channel Code
VGC	LQ
VG1	LB
VG2	LC
VG3	LD
VG4	LE
VG5	LF
VG6	LG
VG7	LH
VG8	LJ
VG9	LK
VG10	LN
VG11	LP
VG12	LR

(D)
(D)
(D)
(D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.4 **Service Designator/Network Channel Code Conversion Table** (Cont'd)

Service Designator Code	Network Channel Code	
DA1	XA	
DA2	XB	
DA3	XG	
DA4	XH	
HCO	HS	
HC1	HC	(D)
HC3	HF	(D)

ACCESS SERVICE

9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.5 Compatible Channel Interfaces

The following tables show the channel interface codes (CIs) which are compatible:

(A) (Reserved for Future Use) (C)

(D)

(D)

(B) (Reserved for Future Use) (S)(x)

(S)(x)

(S)(x)

(D)

(x) Reissued material filed under Transmittal No. 1117 effective on November 19, 2010.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade

Compatible CIs		Compatible CIs		Compatible CIs	
4AB2	4AB2				
4AB2	4AC2	4AH5-B	6DA2	4AH6-D	2DY2
4AB3	4AC2	4AH5-B	4DA2	4AH6-C	9DY2
4AB2	2AC2	4AH5-B	2DA2	4AHG-C	9DY3
4AB3	2AC2			4AH6-C	6DY2
2AB2	2AC2	4AH6-D	4DE2	4AH6-C	6DY3
2AB3	2AC2	4AH6-C	4DE2	4AH6-C	4DY2
		4AH5-B	4DE2	4AH6-C	2DY2
4AB2	4SF2	4AH6-D	2DE2	4AH5-B	9DY2
4AB3	4SF2	4AH6-C	2DE2	4AH5-B	9DY3
		4AH5-B	2DE2	4AH5-B	6DY2
4AH6-D	4AC2			4AH5-B	6DY3
4AH6-D	2AC2	4AH6-D	4DX3	4AH5-B	4DY2
4AH6-C	4AC2	4AH6-C	4DX3	4AH5-B	2DY2
4AH6-C	2AC2	4AH5-B	4DX3		
4AH5-B	4AC2	4AH6-D	4DX2	4AH6-D	9EA2
4AH5-B	2AC2	4AH6-C	4DX2	4AH6-D	9EA3
		4AH5-B	4DX2	4AH6-D	6EA2-E
4AH6-D	2CT3			4AH6-D	6EA2-M
				4AH6-D	4EA2-E
4AH6-C	2CT3			4AH6-D	4EA2-M
4AH5-B	2CT3			4AH6-C	9EA2
4AH6-D	6DA2			4AJ7-C	9EA3
4AH6-D	4DA2	4AH6-D	9DY2	4AH6-C	6EA2-E
4AH6-D	2DA2	4AH6-D	9DY3		
4AH6-C	6DA2	4AH6-D	6DY2		
4AH6-C	4DA2	4AH6-D	6DY3		
4AH6-C	2DA2	4AH6-D	4DY2		

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
4AH6-C	6EA2-M	4AH6-D	6GS2	4AH6-D	2LO2
4AH6-C	4EA2-E	4AH6-D	4GS2	4AH6-C	2LO3
4AH6-C	4EA2-M	4AH6-D	2GS3	4AH6-C	2LO2
4AH5-B	9EA2	4AH6-D	2GS2	4AH5-B	2LO3
4AH5-B	9EA3	4AH6-C	6GS2	4AH5-B	2LO2
4AH5-B	6EA2-E	4AH6-C	4GS2		
4AH5-B	6EA2-M	4AH6-C	2GS3	4AH6-B	4LR2
4AH5-B	4EA2-E	4AH6-C	2GS2	4AH6-D	2LR2
4AH5-B	4EA2-M	4AH5-B	6GS2	4AH6-C	4LR2
		4AH5-B	4GS2	4AH6-C	2LR2
4AH6-D	8EB2-E	4AH5-B	2GS3	4AH5-B	4LR2
4AH6-D	8EB2-M	4AH5-B	2GS2	4AH5-B	2LR2
4AH6-D	6EB2-E				
4AH6-D	6EB2-M	4AH6-D	2LA2	4AH6-D	6LS2
4AH6-C	8EB2-E	4AH6-C	2LA2	4AH6-D	4LS2
4AH6-C	8EB2-M	4AH5-B	2LA2	4AH6-D	2LS2
4AH6-C	6EB2-E			4AH6-D	2LS3
4AH6-C	6EB2-M	4AH6-D	2LB2	4AH6-C	6LS2
4AH5-B	8EB2-E	4AHG-C	2LB2	4AH6-C	4LS2
4AH5-B	8EB2-M	4AH5-B	2LB2	4AH6-C	2LS2
4AH5-B	6EB2-E			4AH6-C	2LS3
4AH5-B	6EB2-M	4AH6-D	2LC2	4AH5-B	6LS2
		4AH6-C	2LC2	4AH5-B	4LS2
4AH6-D	2GO2	4AH5-B	2LC2	4AH5-B	2LS2
4AH6-D	2GO3				
4AH6-C	2GO2				
4AH6-C	2GO2			4AH5-B	2LS3
4AH5-B	2GO2	4AH6-D	2LO3		
4AH5-B	2GO3				

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		
		2CT3	8EB2-E	(D)
4AJ7-D	2TF2	2CT3	8EB2-M	|
		2CT3	6482-E	|
		2CT3	6EB2-M	|
				(D)
		2CT3	6EB3-E	
	2CT3	4DS9 *		
		2CT3	8EC2	
2CT3	6DX2			
2CT3	4DX2	2CT3	4SF2	
2CTS	4DX3	2CT3	4SF3	
2CT3	9DY3	6DA2	6DA2	(D)
2CT3	6DY3	6DA2	4DA2	|
2CT3	9DT2	4DA2	4DA2	|
2CT3	6DY2			|
2CT3	4DY3	4DB2	6DA2	|
2CT3	2DY2	4DB2	4DA2	(D)
		4DB2	2DA2	
2CT3	9EA3			(D)
2CT3	9EA2	2DB2	2DA2	|
2CT3	6EA2-E	4DB2	4DB2	|
2CT3	6EA2-M	4DB2	4NO2	|
2CT3	4EA2-E	4DB2	2NO2	|
2CT3	4EA2-M	2DB2	2NO2	(D)
		4DB2	4PR2	
		4DB2	2PR2	
		2DB2	2PR2	

* See 9.3.3 preceding for explanation.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs	
4DD3	4DE2	4DS8-*	9DY3
4DD3	2DE2	4DS8-*	9DY2
		4DS8-*	6DY3
4DS8-*	4AC2	4DS8-*	6DY2
4DS8-*	2AC2	4DS8-*	4DY2
		4DS8-*	2DY2
4DS8-*	6DA2		
4DS8-*	4DA2		
4DS8-*	2DA2	4DS8-*	9EA2
		4DS8-*	9EA3
4DS8-*	4DE2	4DS8-*	6EA2-E
4DS8-*	EDE2	4DS8-*	6EA2-M
		4DS8-*	4EA2-E
4DS8-*	4DX3	4DS8-*	4EA2-E
4DS8-*	4DX2		

* See 9.3.3 preceding for explanation.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
4DS8-*	8EB2-E	4DS8-*	4NO2	4DX3	9DY2
4DS8-*	8EB2-M	4DS8-*	2NO2	4DX2	6DY3
4DS8-*	6EB2-E			4DX3	6DY3
4DS8-*	6EB2-M	4DS8-*	4PR2	4DX2	6DY2
		4DS8-*	2PR2	4DX3	6DY2
4DS8-*	2GO2			4DX2	4DY2
4DS8-*	2GO3	4DS8-*	4RV2-T	4DX3	4DY2
4DS8-*	6GS2	4DS8-*	2RV2-T	4DX2	2DY2
4DS8-*	4GS2			4DX3	2DY2
4DS8-*	2GS2	4DS8-*	4SF2		
4DS8-*	2GS3	4DS8-*	4SF3	6DX2	9EA3
				6DX2	9EA2
4DS8-*	2LA2	4DS8-*	4TF2	6DX2	6EA2-E
		4DS8-*	2TF2	6DX2	6EA2-M
4DS8-*	2LB2			6DX2	4EA2-E
		4DX2	4DX2	6DX2	4EA2-M
8DS8-*	2LC2	4DX3	4DX2	4DX2	9EA2
		4DX3	4DX3	4DX3	9EA2
4DS8-*	2LO2			4DX2	9EA3
4DS8-*	2LO3	6DX2	9DY3	4DX3	9EA3
		6DX2	9DY2	4DX2	6EA2-E
4DS8-*	4LR2	6DX2	6DY3	4DX3	6EA2-E
4DS8-*	2LR2	6DX2	6DY2	4DX2	6EA2-M
		6DX2	4DY2	4DX3	6EA2-M
4DS8-*	6LS2	6DX2	2DY2	4DX2	4EA2-E
4DS8-*	4LS2	4DX2	9DY3	4DX3	4EA2-E
4DS8-*	2LS2	4DX3	9DY3	4DX2	4EA2-M
4DS8-*	2LS3	4DX2	9DY2	4DX3	4EA2-M

*

See 9.3.3 preceding for explanation.

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9. Interface Groups, Transmission Specifications and Channel Codes (Cont'd)

9.3 Channel Interface and Network Channel Codes (Cont'd)

9.3.5 Compatible Channel Interfaces (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
6DX2	8EB2-E	4DX2	6LS2	9DY2	6DY3
6DX2	8EB2-M	4DX3	6LS2	9DY3	4DY2
6DX2	6EB2-E	4DX3	4LS2	9DY2	4DY2
6DX2	6EB2-M	4DX2	4LS2	9DY2	2DY2
4DX2	8EB2-E	4DX3	2LS3	9DY3	2DY2
4DX2	8EB2-M	4DX2	2LS3	6DY3	6DY3
4DX3	8EB2-E	4DX3	2LS2	6DY3	6DY2
4DX3	8EB2-M	4DX2	2LS2	6DY2	6DY2
4DX2	6EB2-E	2DX3	2LS2	6DY3	4DY2
4DX2	6EB2-M	2DX3	2LS3	6DY3	2DY2
4DX3	6E82-E			6DY2	4DY2
4DX3	6EB2-M	4DX3	4RV2-T	6DY2	2DY2
		4DX2	4RV2-T	4DY2	2DY2
4DX2	2LA2	4DX3	2RV2-T	4DY2	4DY2
4DX3	2LA2	4DX2	2RV2-T		
2DX3	2LA2			6EA2-E	4AC2
		6DX2	4SF2	6EA2-M	4AC2
4DX2	2LB2	4DX2	4SF2	6EA2-E	2AC2
4DX3	2LB2	4DX3	4SF2	6EA2-M	2AC2
2DX3	2LB2	4DX2	4SF3		
		4DX3	4SF3	9EA2	9DY3
4DX2	2LC2			9EA2	9DY2
4DX3	2LC2	9DY3	9DY3	9EA2	6DY3
2DX3	2LC2	9DY3	9DY2	9EA2	6DY2
		9DY2	9DY2	9EA2	4DY2
4DX2	2LO3	9DY3	6DY3	9EA2	2DY2
4DX3	2LO3	9DY3	6DY2	9EA3	9DY3
2DX3	2LO3	9DY2	6DY2		

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9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
9EA3	9DY2	4EA2-M	9DY2	4EA3-E	9EA2
9EA3	6DY3	4EA2-M	6DY3	4EA3-E	9EA3
9EA3	6DY2	4EA2-M	6DY2	4EA2-M	4EA2-M
9EA3	4DY2	4EA2-M	4DY2		
9EA3	2DY2	4EA2-M	2DY2	9EA2	8EB2-E
6EA2-E	9DY3			9EA2	8EB2-M
6EA2-E	9DY2	9EA2	9EA2	9EA2	6EB2-E
6EA2-E	6DY3	9EA2	9EA3	9EA2	6EB2-M
6EA2-E	6DY2	9EA2	6EA2-E	9EA3	8EB2-E
6EA2-E	4DY2	9EA2	6EA2-M	9EA3	8E82-M
6EA2-E	2DY2	9EA2	4EA2-E	9EA3	6EB2-E
6EA2-M	9DY3	9EA2	4EA2-M	9EA3	6EB2-M
6EA2-M	9DY2	9EA3	9EA3	6EA2-E	8EB2-E
6EA2-M	6DY3	9EA3	6EA2-E	6EA2-E	8EB2-M
6EA2-M	6DY2	9EA3	6EA2-M	6EA2-E	6EB2-E
6EA2-M	4DY2	9EA3	4EA2-E	6EA2-E	6EB2-M
6EA2-M	2DY2	9EA3	4EA2-M	6EA2-M	8EB2-E
4EA2-E	9DY3	6EA2-E	6EA2-E	6EA2-M	8E82-M
4EA2-E	9DY2	6EA2-E	6EA2-M	6EA2-M	6EB2-E
4EA3-E	9DY3	6EA2-M	6EA2-M	6EA2-M	6EB2-M
4EA3-E	9DY2	6EA2-E	4EA2-E	4EA2-E	8EB2-E
4EA3-E	6DY3	6EA2-E	4EA2-M	4EA2-E	8EB2-M
4EA3-E	6DY2	6EA2-M	4EA2-E	4EA3-E	8EB2-E
4EA3-E	4DY2	6EA2-M	4EA2-M	4EA3-E	8E82-M
4EA3-E	2DY2	4EA2-E	4EA2-E	4EA2-E	6EB2-E
4EA2-E	6DY3	4EA3-E	6EA2-E	4EA2-E	6EB2-M
4EA2-E	6DY2	4EA3-E	6EA2-M	4EA3-E	6EB2-E
4EA2-E	4DY2	4EA3-E	4EA2-E	4EA3-E	6EB2-M
4EA2-E	2DY2	4EA3-E	4EA2-M	4EA2-M	8EB2-E
4EA2-M	9DY3	4EA2-E	4EA2-M		

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9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
4EA2-M	8EB2-M	9EA3	43F2	6EB3-E	9DY2
4EA2-M	6EB2-E	9EA2	4SF2	6EB3-E	9DY3
4EA2-M	6EB2-M	6EA2-E	4SF3	6EB2-E	6DY2
		6EA2-M	4SF3	6EB3-E	6DY2
6EA2-E	2LA2	6EA2-E	4SF2	6EB2-E	6DY3
6EA2-M	2LA2	6EA2-M	4SF2	6EB3-E	6DY3
		4EA3-E	4SF2	6EB2-E	4DY2
6EA2-E	2LB2	4EA2-E	4SF2	6EB3-E	2DY2
6EA2-M	2LB2	4EA2-M	4SF2	6EB3-E	4DY2
				6EB2-M	9DY2
6EA2-E	2LC2	8EB2-E	4AC2	6EB2-M	9DY3
6EA2-M	2LC2	8EB2-M	4AC2	6EB2-M	6DY2
		8EB2-E	2AC2	6EB2-M	6DY3
6EA2-E	2LO3	8EB2-M	2AC2	6EB2-M	4DY2
6EA2-M	2LO3			6EB2-E	2DY2
		8EB2-E	9DY3	6EB2-M	2DY2
6EA2-E	6LS2	8EB2-E	9DY2		
6EA2-M	6LS2	8EB2-E	6DY3	6EB3-E	9EA2
6EA2-E	4LS2	8EB2-E	6DY2	6EB3-E	9EA3
6EA2-M	4LS2	8EB2-E	4DY2	6EB3-E	6EA2-E
6EA2-E	2LS2	8EB2-E	2DY2	6EB3-E	6EA2-M
6EA2-M	2LS2	8EB2-M	9DY3	6EB3-E	4EA2-E
6EA2-E	2LS3	8EB2-M	9DY2	6EB3-E	4EA2-M
6EA2-M	2LS3	8EB2-M	6DY3		
		8EB2-M	6DY2	8EB2-E	8EB2-E
6EA2-E	4RV2-T	8EB2-M	4DY2	8EB2-E	8EB2-M
6EA2-M	4RV2-T	8EB2-M	2DY2	8EB2-M	8EB2-M
6EA2-E	2RV2-T	6EB2-E	9DY2	8EB2-E	6EB2-E
6EA2-M	2RV2-T	6EB2-E	9DY3	8EB2-E	6EB2-M

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

Channel Interface and Network Channel Codes (Cont'd)

9.3

Compatible Channel Interfaces (Cont'd)

9.3.5

Voice Grade (Cont'd)

(C)

Compatible CIs		Compatible CIs		Compatible CIs	
8EB2-M	6EB2-E	8EB2-E	4RV2-T	8EC2	8EB2-M
8EB2-M	6EB2-M	8EB2-M	4RV2-T	8EC2	6EB2-E
6EB2-E	6EB2-E	8EB2-E	2RV2-T	8EC2	6EB2-M
6EB2-E	6EB2-M	8EB2-M	2RV2-T		
6EB3-E	8EB2-E			8EC2	4SF2
6EB3-E	8EB2-M	8EB2-E	4SF2	6EX2-B	2GO3
6EB2-M	6EB2-M	8EB2-M	4SF2	6EX2-A	6GS2
		8EB2-E	4SF3	6EX2-A	4GS2
8EB2-E	2LA2	8EB2-M	4SF3	6EX2-A	2GS2
8EB2-M	2LA2	6EB3-E	4SF2	6EX2-A	2GS3
		6EB2-E	4SF2		
8EB2-E	2LB2	6EB2-M	4SF2	6EX2-B	2LA2
8EB2-M	2LB2				
		8EC2	9DY2	6EX2-B	2LB2
8EB2-E	2LC2	8EC2	9DY3		
8EB2-M	2LC2	8EC2	6DY2	6EX2-B	2LC2
		84C2	6DY3		
8EB2-E	2LO3	8EC2	4DY2	6EX2-B	2LO2
8EB2-M	2LO3	8EC2	2DY2	6EX2-B	2LO3
8EB2-E	6LS2	8EC2	9EA2	6EX2-B	4LR2
8EB2-M	6LS2	8EC2	9EA3	6EX2-B	2LR2
8EB2-E	4LS2	8EC2	6EA2-E		
8EB2-M	4LS2	8EC2	6EA2-M	6EX2-A	6LS2
8EB2-E	2LS2	8EC2	4EA2-E	6EX2-A	4LS2
8EB2-M	2LS2	8EC2	4EA2-M	6EX2-A	2LS2
8EB2-E	2LS3			6EX2-A	2LS3
8EB2-M	2LS3	8EC2	8EB2-E		

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
6EX2-A	4SF2	6LO2	6LS2	4LR2	4SF2
6EX2-B	4SF2	6LO2	4LS2	4LR3	4SF2
		6LO2	2LS2		
6GO2	6GS2	6LO2	2LS3	6LS2	2LA2
6GO2	4GS2	4LO2	6LS2	4LS2	2LA2
6GO2	2GS2	4LO2	4LS2	4LS3	2LA2
6GO2	2GS3	4LO3	6LS2	2LS2	2LA2
4GO2	6GS2	4LO3	4LS2	2LS3	2LA2
4GO3	6GS2	4LO3	2LS3		
4GO2	4GS2	4LO3	2LS2	6LS2	2LB2
4GO3	4GS2	4LO2	2LS2	4LS2	2LB2
4GO2	2GS2	4LO2	2LS3	4LS3	2LB2
4GO2	2GS3	2LO3	2LS3	2LS2	2LB2
4GO3	2GS2	2LO3	2LS2	2LS3	2LB2
4GO3	2GS3	2LO2	2LS2		
2GO2	2GS2	2LO2	2LS3	6LS2	2LC2
2GO3	2GS2			4LS2	2LC2
2GO2	2GS3	6LO2	4SF2	4LS3	2LC2
2GO3	2GS3	4LO2	4SF2	2LS2	2LC2
		4LO3	4SF2	2LS3	2LC2
6GO2	4SF2				
4GO2	4SF2	4LR2	4LR1	6LS2	2LO3
4GO3	4SF2	4LR3	2LR2	6LS2	2LO2
		4LR2	4LR2	4LS2	2LO2
6GS2	2GO2	4LR2	2LR2	4LS2	2LO3
4GS2	2GO2	2LR2	2LR2	4LS3	2LO2
4GS3	2GO2	2LR3	2LR2	4LS3	2LO3
4GS2	2GO3				

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs		Compatible CIs		Compatible CIs	
6LS2	4SF2	4SF3	9DY2	4SF3	2LA2
4LS3	4SF2	4SF2	9DY3		
		4SF3	6DY3	4SF2	2LB2
4NO2	6DA2	4SF2	6DY3	4SF3	2LB2
4NO2	4DA2	4SF2	6DY3		
4NO2	2DA2	4SF3	6DY2	4SF2	2LC2
2NO2	2DA2	4SF2	4DY2	4SF3	2LC2
		4SF3	4DY2		
4NO2	4DE2	4SF3	2DY2	4SF2	2LO3
4NO2	2DE2	4SF2	2DY2	4SF3	2LO3
4NO2	4NO2	4SF3	9EA2	4SF2	2LR2
4NO2	2NO2	4SF3	9EA3	4SF3	4LR2
2NO2	2NO2	4SF3	4EA2-E	4SF3	2LR2
2NO3	2NO2	4SF3	4EA2-M		
				4SF3	6LS2
2NO3	2PR2	4SF3	6EB2-E	4SF2	4LS2
		4SF3	6EB2-M	4SF3	4LS2
4RV2-0	4RV2-T	4SF3	2GO3	4SF2	2LS2
4RV2-0	2RV2-T	4SF3	6GS2	4SF2	2LS3
4RV2-0	2RV2-T	4SF2	6GS2	4SF3	2LS2
		4SF2	6GS2	4SF3	2LS3
4RV2-0	4SF2	4SF3	4GS2		
		4SF2	2GS2	4SF3	4RV2-T
4SF2	4AC2	4SF2	2GS3	4SF2	4RV2-T
4SF2	2AC2	4SF3	2GS2	4SF2	2RV2-T
		4SF3	2GS3	4SF3	2RV2-T
4SF3	9DY3				
4SF2	9DY2	4SF2	2LA2	4SF3	4SF3

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(C) Voice Grade (Cont'd)

Compatible CIs

4SF3	4SF2
4SF2	4SF2
4TF2	4TF2
4TF2	2TF2
2TF3	2TF2

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(D) (Reserved) (C)

(E) (Reserved) (D)

(D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(F) (Reserved for Future Use)

(G) (Reserved for Future Use) (C)

(D)
|
(D)

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

Channel Interface and Network Channel Codes (Cont'd)

9.3

Compatible Channel Interfaces (Cont'd)

9.3.5

Digital Data

(H)

Digital Data

(1)

Compatible CIs		Compatible CIs		Compatible CIs	
			4DS8-15	6DU5-48	
4DS8-15	4DU8-15+	4DS8-15	6DU5-56	4DU5-96	4DU5-96
4DS8-15	4DU8-24	4DS8-15	6DU5-96	6DU5-24	6DU5-24
4DS8-15	4DU8-48	4DU5-24	4DU5-24	6DU5-48	6DU5-48
4DS8-15	4DU8-56	4DU5-48	4DU5-48	6DU5-56	6DU5-56
4DS8-15	6DU5-96	4DU8-56	4DU5-56	6DU5-96	6DU5-96
4DS8-I5	6DU5-24	4DS9-15	4DU5-19	4DS6-44A	4DU5-19
4DS9-15B	4DU5-64	4DS6-44A	4DU5-64		

\+ Available only as a cross connect of two digital circuits at appropriate digital speeds at a Telephone Company hub.

ACCESS SERVICE

9. **Interface Groups, Transmission Specifications and Channel Codes** (Cont'd)

9.3 **Channel Interface and Network Channel Codes** (Cont'd)

9.3.5 **Compatible Channel Interfaces** (Cont'd)

(I) High Capacity

Compatible CIs		Compatible CIs		
		4DS8-15	4DU8-8	
4DSO-63	4DSO-63	4DS8-I5J	6DU8-A	
4DSO-63	6DU8-A,B or C	4DS8-15J	4DU8-A	
4DSO-63	4DU8-A,B or C	4DS8-15K	6DU8-B	
4DS6-27	4DS6-27	4DS8-I5K	4DU8-B	
4DS6-27	6DU8-A,B or C	4DS8-15K	6DU8-C	
4DS6-27	4DU8-A,B or C	4DS8-15K	4D78-C	
4DS6-44	4DS6-44			(D)
4DS6-44	6DU8-A,B or C			(D)
4DS6-44	4DU8-A,B or C	4DS9-	4DU8-A,B or C	
4DS8-15	4DS8-15+	4DU9-A,B or C	4DU8-A,B or C	
4DS8-15	6DU8-B	4DS9-15	4DU5-19	
4DS6-44A	4DU5-19	4DS9-15B	4DU5-64	
4DS6-44A	4DU5-64			

\+ Available only as a cross connect of two individual circuits of 1.544 Mbps facilities at a Telephone Company hub.

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