

ACCESS SERVICE

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15. Access Service Interfaces and Transmission Specifications

15.1 Switched Access Service

Ten Interface Groups are provided for terminating the Local Transport Entrance Facility at the customer's designated premises. Each Interface Group provides a specified premises interface (i.e., two-wire, four-wire, DS1, etc.). Where transmission facilities permit, and at the option of the customer, the Entrance Facility may be provided with optional features as set forth in Section 15.1.1 following.

As a result of the customer's access order and the type of Telephone Company transport facilities serving the customer designated 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 designated premises. For example, if a voice frequency interface is ordered by the customer and the Telephone Company facilities serving the customer designated premises are digital, then Telephone Company channel bank equipment must be placed at the customer designated premises in order to provide the voice frequency interface ordered by the customer.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)15.1 Switched Access Service (Cont'd)15.1.1 Local Transport Interface Groups

Interface Groups are combinations of technical parameters which describe the Telephone Company handoff at the point of termination at the customer designated premises. The technical specifications concerning the available interface groups are set forth in (A) through (D) following.

Interface Group 1 is provided with Type C Transmission Specifications, as set forth in Section 15.1.2(C) following, and Interface Groups 2 through 10 are provided with Type A or B Transmission Specifications, as set forth respectively in Section 15.1.2(E) and (F) following, depending on the Feature Group 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 designated premises. The premises interfaces associated with the Interface Groups may vary among Feature Groups.

(A) Interface Group 1

Interface Group 1, except as set forth in the following, provides two-wire voice frequency transmission at the point of termination at the customer designated premises. The interface is capable of transmission of voice and associated telephone signals within the frequency bandwidth of approximately 300 to 3000 Hz.

Interface Group 1 is not provided in association with FGC and FGD when the first point of switching is an access tandem. In addition, Interface Group 1 is not provided in association with FGB, FGC or FGD when the first point of switching provides only four-wire terminations.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(A) Interface Group 1 (Cont'd)

The transmission path between the point of termination at the customer designated premises and the first point of switching may be comprised of any form or configuration of plant 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.

The interface is provided with loop supervisory signaling. When the interface is associated with FGA, such signaling will be loop start or ground start signaling. When the interface is associated with FGB, FGC or FGD, such signaling, except for two-way calling which is E&M signaling, will be reverse battery signaling.

(B) Interface Group 2

Interface Group 2 provides four-wire voice frequency transmission at the point of termination at the customer designated premises. The interface is capable of transmission of voice and associated telephone signals within the frequency bandwidth of approximately 300 to 3000 Hz.

The transmission path between the point of termination at the customer designated premises and the first point of switching may be comprised of any form or configuration of plant capable of and typically used in the telecommunications industry for the transmission of voice and associated telephone signals within the frequency bandwidth of approximately 300 to 3000 Hz.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(B) Interface Group 2 (Cont'd)

The interface is provided with loop supervisory signaling. When the interface is associated with FGA, such signaling will be loop start or ground start signaling. When the interface is associated with FGB, FGC or FGD, such signaling, except for two-way calling which is E&M signaling, will be reverse battery signaling.

(C) Interface Groups 3 through 5

Interface Groups 3 through 5 provide analog transmission at the point of termination at the customer designated premises. The various interfaces are capable of transmitting electrical signals at the frequencies illustrated following, with the capability to channelize voice frequency transmission paths. Certain frequencies within the bandwidth of the Interface Groups are reserved for Telephone Company use, (i.e., pilot and carrier group alarm tones). Before the first point of switching, the Telephone Company will provide multiplex equipment to derive the transmission paths of frequency bandwidth of approximately 300 to 3000 Hz.

The interfaces are provided with individual transmission path SF supervisory signaling.

<u>Interface Group Identification No.</u>	<u>Transmission Frequency Bandwidth</u>	<u>Analog Hierarchy Level</u>	<u>Maximum No. of Channelized Voice Frequency Trans. Paths</u>
3	60 - 108 kHz	Group	12
4	312 - 552 kHz	Supergroup	60
5	564 - 3084 kHz	Mastergroup	600

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(D) Interface Groups 6 through 10

Interface Groups 6 through 10 provide digital transmission at the point of termination at the customer designated premises. The various interfaces are capable of transmitting electrical signals at the nominal bit rates illustrated following, with the capability to channelize 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 transmission paths of 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(s) in D3/D4 format.

The interfaces are provided with individual transmission path bit stream supervisory signaling.

<u>Interface Group Identification No.</u>	<u>Nominal Bit Rate (Mbps)</u>	<u>Digital Hierarchy Level</u>	<u>Maximum No. of Channelized Voice Frequency Trans. Paths</u>
6	1.544	DS1	24
7	3.152	DS1C	48
8	6.312	DS2	96
9	44.736	DS3	672
10	274.176	DS4	4032

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(E) Local Transport Optional Features

Where transmission facilities permit, the Telephone Company will, at the option of the customer, provide the following features in association with Local Transport.

When Clear Channel Capability optional feature is installed on an existing facility, the addition will be treated as a discontinuance and start of service and all associated nonrecurring charges will apply.

- Customer Specified Entry Switch Receive Level

Customer Specified Entry Switch Receive Level allows the customer to specify the receive transmission level at the first point of switching. The range of transmission levels which may be specified is described in Technical Reference GR-334-CORE. This feature is available with Interface Groups 2 through 10 for FGA and FGB.

- Customer Specification of Local Transport Termination

Customer Specification of Local Transport Termination allows the customer to specify, for FGB routed directly to an end office or access tandem, a four-wire termination of the Local Transport at the first point of switching in lieu of a Telephone Company selected two-wire termination. This option is available only when the FGB arrangement is provided with Type B Transmission Specifications.

- Supervisory Signaling

Supervisory Signaling allows the customer to order an optional supervisory signaling arrangement for each transmission path provided where the transmission parameters permit, and where signaling conversion is required by the customer to meet its signaling capability.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(E) Local Transport Optional Features (Cont'd)

- Supervisory Signaling (Cont'd)

The Interface Groups, as described in (A) through (D) preceding, represent industry standard arrangements. Where transmission parameters permit, the customer may select the following optional signaling arrangements in place of the signaling arrangements standardly associated with the Interface Groups.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(E) Local Transport Optional Features (Cont'd)

- Clear Channel Capability

Clear Channel Capability allows the customer to transport voice or data signals over a 64 Kbps channel with no constraints on the quantity or sequence of ones and zero bits. This option employs the Bipolar 8 Zero Suppression (B8ZS) technique to permit customers to use the full 64 Kbps bandwidth of a DS0 channel. It is only available in suitably equipped electronic end offices as identified in NATIONAL EXCHANGE CARRIER ASSOCIATION, INC. TARIFF F.C.C. NO. 4. Clear Channel Capability, as described in Technical Reference GR-334-CORE, is available with Interface Groups 6 and 9 for FGC and FGD with Signaling System 7 (SS7) signaling.

For Interface Groups 1 and 2 associated with FGB, FGC or FGD:

DX Supervisory Signaling,
E&M Type I Supervisory Signaling,
E&M Type II Supervisory Signaling, or
E&M Type III Supervisory Signaling.

- For Interface Group 2 associated with FGB, FGC or FGD and in addition to the preceding:

SF Supervisory Signaling, or
Tandem Supervisory Signaling.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(E) Local Transport Optional Features (Cont'd)

- For Interface Groups 3 through 5:
Optional Supervisory Signaling Not Available.
- For Interface Groups 6 through 10:

These Interface Groups may, at the option of the customer, be provided with individual transmission path SF supervisory signaling where such signaling is available in Telephone Company central offices. Generally such signaling is available only where the first point of switching provides an analog (i.e., non digital) interface to the transport termination.

These optional Supervisory Signaling arrangements are not available in combination with the SS7 optional feature as described in Section 6.8.2(C)(2), preceding.

Additionally, in (F) following, there is a matrix of available Premises Interface Codes as a function of Interface Group, Telephone Company Switch Supervisory Signaling and Feature Group.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(F) Available Premises Interface Codes

Following is a matrix showing premises interface codes which are available for each Interface Group. Their availability is a function of the Telephone Company switch supervisory signaling and Feature Group. For explanations of these codes, see the Facility Interface Codes and Options as set forth in Section 15.2.3(A) following.

Interface Group	Telephone Company Switched Supervisory Signaling	Premises Interface Code	Feature Group				
			A	B	C	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	X	
	RV, EA, EB, EC	4EA3-E		X	X	X	
	RV, EA, EB, EC	4EA3-M		X	X	X	
	RV, EA, EB, EC	6EB3-E		X	X	X	
	RV, EA, EB, EC	6EB3-M		X	X	X	
	EA, EB, EC	6EC3			X	X	
	RV	2RV3-0		X	X	X	
	RV	2RV3-T		X	X	X	
	SS7	2N02			X	X	
	2	LO, GO	4SF2	X			
		LO, GO	4SF3	X			
LO		4LS2	X				
LO		4LS3	X				
LO		6LS2	X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(F) Available Premises Interface Codes (Cont'd)

Interface Group	Telephone Company Supervisory Signaling	Premises Interface Code	Feature Group				
			A	B	C	D	
2 (Cont'd)	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				
	RV, EA, EB, EC	4SF2		X	X	X	
	RV, EA, EB, EC	4SF3		X	X	X	
	RV, EA, EB, EC	4DX2		X	X	X	
	RV, EA, EB, EC	4DX3		X	X	X	
	RV, EA, EB, EC	6DX2		X	X	X	
	RV, EA, EB, EC	6EA2-E		X	X	X	
	RV, EA, EB, EC	6EA2-M		X	X	X	
	RV, EA, EB, EC	8EB2-E		X	X	X	
	RV, EA, EB, EC	8EB2-M		X	X	X	
	EA, EB, EC	8EC2-M			X	X	
	RV	4RV2-O		X	X	X	
	RV	4RV2-T		X	X	X	
	RV	4RV3-O		X	X	X	
	RV	4RV3-T		X	X	X	
	SS7	4N02			X	X	
	3	LO, GO	4AH5-B	X			
		RV, EA, EB, EC	4AH5-B		X	X	X
SS7		4AH5-B			X	X	
4	LO, GO	4AH6-C	X				
	RV, EA, EB, EC	4AH6-C		X	X	X	
	SS7	4AH6-C			X	X	
5	LO, GO	4AH6-D	X				
	RV, EA, EB, EC	4AH6-D		X	X	X	
	SS7	4AH6-D			X	X	

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.1 Local Transport Interface Groups (Cont'd)

(F) Available Premises Interface Codes (Cont'd)

Interface Group	Telephone Company Switched Supervisory Signaling	Premises Interface Code	Feature Group			
			A	B	C	D
6	LO, GO	4DS9-15	X			
	LO, GO	4DS9-15L	X			
	RV, EA, EB, EC	4DS9-15		X	X	X
	RV, EA, EB, EC	4DS9-15L		X	X	X
	SS7	4DS9-15L			X	X
7	LO, GO	4DS9-31	X			
	LO, GO	4DS9-31L	X			
	RV, EA, EB, EC	4DS9-31		X	X	X
	RV, EA, EB, EC	4DS9-31L		X	X	X
	SS7	4DS9-31			X	X
8	LO, GO	4DS0-63	X			
	LO, GO	4DS0-63L	X			
	RV, EA, EB, EC	4DS0-63		X	X	X
	RV, EA, EB, EC	4DS0-63L		X	X	X
	SS7	4DS0-63			X	X
9	LO, GO	4DS6-44	X			
	LO, GO	4DS6-44L	X			
	RV, EA, EB, EC	4DS6-44		X	X	X
	RV, EA, EB, EC	4DS6-44L		X	X	X
	SS7	4DS6-44			X	X
10	LO, GO	4DS6-27	X			
	LO, GO	4DS6-27L	X			
	RV, EA, EB, EC	4DS6-27		X	X	X
	RV, EA, EB, EC	4DS6-27L		X	X	X
	SS7	4DS6-27			X	X

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications

Descriptions of the transmission specifications available with each Feature Group as a function of the Interface Group selected by the customer, are set forth in (A) through (D) following. Descriptions of each of these Standard Transmission Specifications and the two Data Transmission Parameters mentioned are set forth respectively in (E) through (G) following and Section 15.1.3(A) and (B) following:

(A) Feature Group A (FGA)

FGA is provided with either Type B or Type C Transmission Specifications. The specifications for the associated parameters are guaranteed to the first point of switching. Type C Transmission Specifications are provided with Interface Group 1 and Type B is provided with Interface Groups 2 through 10. Type DB Data Transmission Parameters are provided with FGA to the first point of switching.

(B) Feature Group B (FGB)

FGB is provided with either Type B or Type C Transmission Specifications. The specifications for the associated parameters are guaranteed to the end office when routed directly or to the first point of switching when routed via an access tandem. Type C Transmission Specifications are provided with Interface Group 1 and Type B is provided with Interface Groups 2 through 10. Type DB Data Transmission Parameters are provided with FGB to the first point of switching.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(C) Feature Group C (FGC)

FGC is provided with either Type B or Type C Transmission Specifications as follows:

- When routed directly to the end office either Type B or Type C is provided.
- When routed to an access tandem only Type B is provided.
- Type B or Type C is provided on the transmission path from the access tandem to the end office.

Type C Transmission Specifications are provided with Interface Group 1 when routed directly to an end office. Type B is provided with Interface Groups 2 through 10, whether routed directly to an end office or to an access tandem.

Type DB Data Transmission Parameters are provided with FGC for the transmission path between the customer designated premises and the end office when directly routed to the end office, and between the customer designated premises and the access tandem and between the access tandem and the end office when routed via an access tandem.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(D) Feature Group D (FGD)

FGD is provided with either Type A, Type B or Type C Transmission Specifications as follows:

- When routed to the end office either Type B or C is provided.
- When routed to an access tandem only Type A is provided.
- Type A is provided on the transmission path from the access tandem to the end office.

Type C Transmission Specifications are provided with Interface Group 1. Type A and Type B Transmission Specifications are provided with Interface Groups 2 through 10.

Type DB Data Transmission Parameters are provided with FGD for the transmission path between the customer designated premises and the end office when directly routed to the end office. Type DA Data Transmission Parameters are provided for the transmission path between the customer designated premises and the access tandem and between the access tandem and the end office when routed via an access tandem.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(E) 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.

(2) Attenuation Distortion

The maximum Attenuation Distortion in the 404 to 2804 Hz frequency band relative to the loss at 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:

<u>Route Miles</u>	<u>C-Message Noise</u>
less than 50	32 dBmCO
51 to 100	34 dBmCO
101 to 200	37 dBmCO
201 to 400	40 dBmCO
401 to 1000	42 dBmCO

(4) C-Notched Noise

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

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

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

(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:

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
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:

<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
5 dB	2.5 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(F) Type B Transmission Specifications

Type B Transmission Specifications are 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 in the 404 to 2804 Hz frequency band relative to loss at 1004 Hz is -2.0 dB to +4.0 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:

<u>Route Miles</u>	<u>C-Message Noise*</u>	
	<u>Type B1</u>	<u>Type B2</u>
less than 50	32 dBmCO	35 dBmCO
51 to 100	33 dBmCO	37 dBmCO
101 to 200	35 dBmCO	40 dBmCO
201 to 400	37 dBmCO	43 dBmCO
401 to 1000	39 dBmCO	45 dBmCO

(4) C-Notched Noise

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

* For FGC and FGD only Type B2 will be provided. For FGA and FGB, Type B1 or B2 will be provided as set forth in Technical Reference GR-334-CORE.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

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

(5) Echo Control

Echo Control, identified as Impedance Balance for FGA and FGB and Equal Level Echo Path Loss for FGC and FGD, 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 Feature Group, type of termination, and type of transmission path. They are greater than or equal to the following:

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
POT to Access Tandem		
- Terminated in Four-Wire trunk	21 dB	14 dB
- Terminated in Two-Wire trunk	16 dB	11 dB
POT to End Office		
- Direct	16 dB	11 dB
- Via Access Tandem		
· For FGB access	8 dB	4 dB
· For FGC access (Effective four-wire transmission path at end office)	16 dB	11 dB
· For FGD access (Effective two-wire transmission path at end office)	13 dB	6 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(F) Type B Transmission Specifications (Cont'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:

<u>Echo Return</u>	<u>LossSinging Return Loss</u>
5 dB	2.5 dB

(G) Type C Transmission Specifications

Type C Transmission Specifications are 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 the loss at 1004 Hz is -2.0 dB to +5.5 dB.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(G) Type C 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:

<u>Route Miles</u>	<u>C-Message Noise*</u>	
	<u>Type C1</u>	<u>Type C2</u>
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-Notched Noise

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

* For FGC and FGD only Type B2 will be provided. For FGA and FGB, Type B1 or B2 will be provided as set forth in Technical Reference GR-334-CORE.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.2 Standard Transmission Specifications (Cont'd)

(G) 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:

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
POT to Access Tandem	13 dB	6 dB
POT to End Office		
- Direct	13 dB	6 dB
- Via Access Tandem (or FGB only)	8 dB	4 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.3 Data Transmission Parameters

Two types of Data Transmission Parameters, (i.e., Type DA and Type DB, are provided for the Feature Group arrangements). Type DB is provided with FGA, FGB and FGC and also with FGD when FGD is directly routed to the end office. Type DA is only provided with FGD and only when routed via an access tandem. Following are descriptions of each.

(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 50 route miles 500 microseconds
- equal to or greater than
50 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 dB_{rnCO} threshold in 15 minutes is no more than 15 counts.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.3 Data Transmission Parameters (Cont'd)

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

(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

(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.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.3 Data Transmission Parameters (Cont'd)

(B) Date 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 dB_{rnCO} threshold in 15 minutes is no more than 15 counts.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.1 Switched Access Service (Cont'd)

15.1.3 Data Transmission Parameters (Cont'd)

(B) Date Transmission Parameters Type DB (Cont'd)

(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.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service

This section explains and lists the codes that the customer must specify when ordering Special Access Service, Switched Access Entrance Facilities, Voice Grade and High Capacity Direct Trunked Transport; and outlines the transmission performance requirements for the Switched Access Service and Special Access Service offerings contained in Sections 6 and 7 preceding.

Transmission performance requirements for Switched Access Service and Special Access Service are described in Section 15.2.1 following. Sections 15.2.2 through 15.2.4 following show the relationship between service designator codes and network channel codes, explains the facility interface (FI) codes that the customer can use when ordering Switched Access Service and Special Access Service and details the various combinations and the Switched Access Service and Special Access Service with which they may be ordered.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance

This section describes the transmission performance requirements for Special Access Services described in Sections 7.4 through 7.11 preceding.

(A) Narrowband Services

(1) Narrowband 1 (NB1)

- Leakage

Remedial action will be initiated when the dc resistance between the conductors in each customer pair or the resistance between individual serving pair conductors and ground is observed to be less than 30000 ohms.

(2) Narrowband 2 (NB2)

- Leakage

Remedial action will be initiated when the dc resistance between the conductors in each serving pair and the resistance between individual serving pair conductors and ground is observed to be less than 30000 ohms.

(3) Narrowband 3 (NB3)

Reserved For Future Use.

(4) Narrowband 4 (NB4)

- Telegraph Distortion

Remedial action will be initiated whenever the telegraph distortion is observed to exceed 9%.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(A) Narrowband Services (Cont'd)

(5) Narrowband 5 (NB5)

- Telegraph Distortion

Remedial action will be initiated whenever the telegraph distortion is observed to exceed 12%.

(6) Narrowband 6 (NB6)

- Telegraph Distortion

The terminal equipment shall deliver no more than 8% telegraph distortion and shall be capable of processing received data signals with up to 35% telegraph distortion.

(7) Narrowband 7 (NB7)

- Telegraph Distortion

The terminal equipment shall deliver no more than 5% telegraph distortion and shall be capable of processing received data signals with up to 40% telegraph distortion.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services

(1) Voice Grade 1 (VG1)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(1) Voice Grade 1 (VG1) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Two-Wire Transmission

(Four-wire interface at the IC terminal location, two-wire interface at the end user premises.)

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Standard Return Loss (at Two-Wire Interface)	5 dB	2.5 dB
Four-Wire Interface (Equal Level Echo Path Loss)	16 dB	11 dB

(ii) Effective Four-Wire Transmission

(Two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-Wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in").	20 dB	14 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(1) Voice Grade 1 (VG1) (Cont'd)

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 4.0 dB.

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -2.0 dB and +10.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 504 Hz and 2504 Hz shall be within -2.0 dB and +8.0 dB and between 304 Hz and 3004 Hz shall be within -3.0 dB and +12.0 dB.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(2) Voice Grade 2 (VG2)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(2) Voice Grade 2 (VG2) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Two-Wire Transmission

(Four-wire interface at the IC terminal location, two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Standard Return Loss (at Two-Wire Interface)	5 dB	2.5 dB
Improved Return Loss (at Two-Wire Interface)	13 dB	8 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in")	16 dB	11 dB

(ii) Effective Four-Wire Transmission

(Two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-Wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss)	20 dB	14 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(2) Voice Grade 2 (VG2) (Cont'd)

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +4.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -1.0 dB and +5.0 dB.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(3) Voice Grade 3 (VG3)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBrnC0) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(3) Voice Grade 3 (VG3) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Two-Wire Transmission

(Four-wire interface at the IC terminal location, two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Standard Return Loss (at Two-Wire Interface)	5 dB	2.5 dB
Improved Return Loss (at Two-Wire Interface)	13 dB	8 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in").	16 dB	11 dB

(ii) Effective Four-Wire Transmission

(Two-Wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-Wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss)	20 dB	14 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(3) Voice Grade 3 (VG3) (Cont'd)

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +3.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -1.0 dB and +5.0 dB.

(4) Voice Grade 4 (VG4)

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(5) Voice Grade 5 (VG5)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(5) Voice Grade 5 (VG5) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Two-Wire Transmission

(Four-wire interface at the IC terminal location, two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Standard Return Loss (At Two-Wire Interface)	5 dB	2.5 dB
Four-Wire Interface (Equal Level Echo Path Loss)	16 dB	11 dB

(ii) Effective Four-Wire Transmission

(Two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in").	20 dB	14 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(5) Voice Grade 5 (VG5) (Cont'd)

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +5.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss).

(f) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 26 dB.

(g) Impulse Noise

The number of impulse noise counts exceeding a threshold of 67 dBmCO in 15 minutes shall be less than 15.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(6) Voice Grade 6 (VG6)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(c) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(6) Voice Grade 6 (VG6) (Cont'd)

(d) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +4.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 504 Hz and 2504 Hz shall be within -1.0 dB and +3.0 dB with reference to the loss at 1004 Hz. The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -1.0 dB and +5.0 dB.

(e) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 30 dB.

(f) Envelope Delay Distortion

The Envelope Delay Distortion (EDD) shall not exceed 700 microseconds between 800 and 2600 Hz.

(g) Impulse Noise

The number of impulse noise counts exceeding a threshold of 67 dBmCO in 15 minutes shall be less than 15.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(6) Voice Grade 6 (VG6) (Cont'd)

(h) Intermodulation Distortion

The intermodulation distortion based upon the four-tone method shall be such that R2 is not less than 33 dB and R3 not less than 40 dB.

(i) Phase Jitter

The phase jitter over 20-300 Hz shall not exceed 5° peak-to-peak and over 4-300 Hz shall not exceed 10° peak-to-peak.

(j) Frequency Shift

The frequency shift shall not exceed ± 1 Hz.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(7) Voice Grade 7 (VG7)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(7) Voice Grade 7 (VG7) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Two-Wire Transmission

(Four-wire interface at the IC terminal location, two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Standard Return Loss (at Two-Wire Interface)	5 dB	2.5 dB
Improved Return Loss (at Two-Wire Interface)	13 dB	8 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in")	16 dB	11 dB

(ii) Effective Four-Wire Transmission

(Two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-Wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss)	20 dB	14 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(7) Voice Grade 7 (VG7) (Cont'd)

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +2.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -1.0 dB and +5.0 dB.

(f) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 30 dB.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(7) Voice Grade 7 (VG7) (Cont'd)

(g) Envelope Delay Distortion

The Envelope Delay Distortion (EDD) shall not exceed 700 microseconds between 800 and 2600 Hz.

(h) Impulse Noise

The number of impulse noise counts exceeding a threshold of 67 dBmCO in 15 minutes shall be less than 15.

(i) Intermodulation Distortion

The intermodulation distortion based upon the four-tone method shall be such that R2 is not less than 33 dB and R3 not less than 40 dB.

(j) Phase Jitter

The phase jitter over 20-300 Hz shall not exceed 5° peak-to-peak and over 4-300 Hz shall not exceed 10° peak-to-peak.

(k) Frequency Shift

The frequency shift shall not exceed ± 1 Hz.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(8) Voice Grade 8 (VG8)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBrnC0) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Echo Control

Echo Control, identified as Equal Level Echo Path Loss at four-wire interfaces or Return Loss at two-wire interfaces, and expressed as Echo Return Loss and Singing Return Loss, at either the end user premises or IC terminal location shall not be less than the following limits:

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(8) Voice Grade 8 (VG8) (Cont'd)

(b) Echo Control (Cont'd)

(i) Effective Four-Wire Transmission

(Two-wire interface at the end user premises).

	<u>Echo Return Loss</u>	<u>Singing Return Loss</u>
Two-Wire Interface (Return Loss)	24 dB	18 dB
Four-Wire Interface (Equal Level Echo Path Loss) (For Centrex application, 2 dB pad is "in").	20 dB	14 dB

(c) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB SRL 2.5 dB	ERL 20 dB SRL 13.5 dB

(d) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(8) Voice Grade 8 (VG8) (Cont'd)

(e) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +2.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -1.0 dB and +5.0 dB.

(f) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 32 dB.

(g) Envelope Delay Distortion

The Envelope Delay Distortion (EDD) shall not exceed 700 microseconds between 800 and 2600 Hz.

(h) Impulse Noise

The number of impulse noise counts exceeding a threshold of 67 dBmCO is 15 minutes shall be less than 15.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(8) Voice Grade 8 (VG8) (Cont'd)

(i) Intermodulation Distortion

The intermodulation distortion based upon the four-tone method shall be such that R2 is not less than 45 dB and R3 not less than 48 dB.

(j) Phase Jitter

The phase jitter over 20-300 Hz shall not exceed 4° peak-to-peak and over 4-300 Hz shall not exceed 9° peak-to-peak.

(k) Frequency Shift

The frequency shift shall not exceed ± 1 Hz.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(9) Voice Grade 9 (VG9)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(c) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 1.5 dB.

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

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15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(9) Voice Grade 9 (VG9) (Cont'd)

(d) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -1.0 dB and +2.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -3.0 dB and +12.0 dB.

(e) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 34 dB.

(f) Envelope Delay Distortion

The Envelope Delay Distortion (EDD) shall not exceed 700 microseconds between 800 and 2600 Hz.

(g) Impulse Noise

The number of impulse noise counts exceeding a threshold of 67 dB_{BrnCO} in 15 minutes shall be less than 15.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(9) Voice Grade 9 (VG9) (Cont'd)

(h) Intermodulation Distortion

The intermodulation distortion based upon the four-tone method shall be such that R2 is not less than 50 dB and R3 not less than 54 dB.

(i) Phase Jitter

The phase jitter over 20-300 Hz shall not exceed 3° peak-to-peak and over 4-300 Hz shall not exceed 8° peak-to-peak.

(j) Frequency Shift

The frequency shift shall not exceed ± 1 Hz.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(10) Voice Grade 10 (VG10)

(a) C-Message Noise

The C-Message Noise shall be less than:

<u>Route Miles</u>	<u>Limit (dBmCO) *</u>	
	<u>Type V1</u>	<u>Type V2</u>
0 - 50	32	38
51 - 100	33	39
101 - 200	35	41
201 - 400	37	43
401 - 1000	39	45

(b) Improved Return Loss

The Return Loss (RL), expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), on two-wire ports of a four-wire point of interface shall be equal to or greater than:

<u>Standard RL</u>	<u>Improved RL</u>
ERL 5 dB	ERL 20 dB
SRL 2.5 dB	SRL 13.5 dB

(c) Loss Variation

The long term loss variation from the nominal 1004 Hz EML shall not exceed ± 4 dB.

* Where Facility network conditions will support the parameters, Type V1 will be provided. Where the Type V1 parameters cannot be supported, Type V2 will be provided.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(10) Voice Grade 10 (VG10) (Cont'd)

(d) Attenuation Distortion

The Attenuation Distortion between 404 Hz and 2804 Hz shall be within -2.0 dB and +10.0 dB with reference to the loss at 1004 Hz (minus equals less loss, plus equals more loss). The Attenuation Distortion between 504 Hz and 2504 Hz shall be within -2.0 dB and +8.0 dB with reference to the loss at 1004 Hz. The Attenuation Distortion between 304 Hz and 3004 Hz shall be within -3.0 dB and +12.0 dB.

(e) Signal-to-C-Notched Noise

The Signal-to-C-Notched Noise Ratio shall not be less than 24 dB.

(f) Envelope Delay Distortion

The Envelope Delay Distortion (EDD) shall not exceed 1750 microseconds between 800 and 2600 Hz.

(g) Impulse Noise

The number of impulse noise counts exceeding a threshold of 71 dBmCO is 15 minutes shall be less than 15.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(B) Voice Grade Services (Cont'd)

(10) Voice Grade 10 (VG10) (Cont'd)

(h) Intermodulation Distortion

The intermodulation distortion based upon the four-tone method shall be such that R2 is not less than 27 dB and R3 not less than 32 dB.

(i) Phase Jitter

The phase jitter over 20-300 Hz shall not exceed 10° peak-to-peak and over 4-300 Hz shall not exceed 15° peak-to-peak.

(j) Frequency Shift

The frequency shift shall not exceed ± 3 Hz.

(11) Voice Grade 11 (VG11)

Reserved For Future Use.

(12) Voice Grade 12 (VG12)

Reserved For Future Use.

(13) Voice Grade 13 (VG13)

Reserved For Future Use.

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ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services

(1) Program Audio 1 (AP1)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 10 dB. With the addition of optional gain conditioning, the initial AML will be 0 ± 0.5 dB. Remedial action will be taken when the loss variation at 1004 Hz exceeds the initial AML by ± 4.0 dB.

(b) Gain/Frequency Distortion

Over the frequency band from 200 to 3500 Hz, the gain at any frequency will be within the range from +3.0 dB to -10.0 dB with respect to the gain 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The ratio of received 1004 Hz signal power to the C-message weighted idle circuit noise will be at least 65 dB. The received signal power level is determined by subtracting the channel AML from +18 dBm (the instantaneous peak signal level).

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)15.2 Special Access Service (Cont'd)15.2.1 Transmission Performance (Cont'd)(C) Program Audio Services (Cont'd)(2) Program Audio 2 (AP2)(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB. With the addition of optional gain conditioning, the initial AML will be 0 ± 0.5 dB. Remedial action will be taken when the loss variation at 1004 Hz exceeds the initial AML by ± 4.0 dB.

(b) Gain/Frequency Distortion

Over the frequency band from 100 to 5000 Hz, the gain at any frequency will be 1.0 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The ratio of received 1004 Hz signal power to the 15 kHz flat weighted idle circuit noise will be at least 64 dB. The received signal power level is determined by subtracting the channel AML from +18 dBm (the instantaneous peak signal level).

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(3) Program Audio 3 (AP3)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB. With the addition of optional gain conditioning, the initial AML will be 0 ± 0.5 dB. Remedial action will be taken when the loss variation at 1004 Hz exceeds the initial AML by ± 4.0 dB.

(b) Gain/Frequency Distortion

Over the frequency band from 50 to 8000 Hz, the gain at any frequency will be 1.0 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The ratio of received 1004 Hz signal power to the 15 kHz flat weighted idle circuit noise will be at least 62 dB. The received signal power level is determined by subtracting the channel AML from +18 dBm (the instantaneous peak signal level).

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(4) Program Audio 4 (AP4)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB. With the addition of optional gain conditioning, the initial AML will be 0 ± 0.5 dB. Remedial action will be taken when the loss variation at 1004 Hz exceeds the initial AML by 0 ± 4.0 dB.

(b) Gain/Frequency Distortion

Over the frequency band from 50 to 15000 Hz, the gain at any frequency will be 1.0 dB of the gain 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The ratio of received 1004 Hz signal power to the 15 kHz flat weighted idle circuit noise will be at least 67 dB. The received signal power level is determined by subtracting the channel AML from +18 dBm (the instantaneous peak signal level).

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(5) Program Audio 5 (AP5)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 12 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

For intraexchange channel, the gain at any frequency in the band 200-3000 Hz will be within 1 dB of the gain at 1004 Hz. For interexchange channels, the gain at any frequency will be within 3 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The C-message weighted idle circuit noise will be at least 54 dB below the received power of a 0 dBm 1004 Hz tone transmitted at the far end.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(6) Program Audio 6 (AP6)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

For intraexchange channel, the gain at any frequency in the band 100-5000 Hz will be within 1 dB of the gain at 1004 Hz. For interexchange channels, the gain at any frequency will be within 3 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The 15KC flat weighted circuit noise will be at least 54 dB below the received power of a 0 dBm 1004 Hz test tone transmitted at the far end. For interexchange channels, the noise will be at least 49 dB below the test tone level when T-digital carrier is used or 35 dB below when analog carrier is used.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(7) Program Audio 7 (AP7)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

For intraexchange channel, the gain at any frequency in the band 50-8000 Hz will be within 1 dB of the gain at 1004 Hz. For interexchange channels, the gain at any frequency will be within 3 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The 15KC flat weighted circuit noise will be at least 54 dB below the received power of a 0 dBm 1004 Hz test tone transmitted at the far end. For interexchange channels, the noise will be at least 49 dB below the test tone level when T-digital carrier is used or 35 dB below when analog carrier is used.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(8) Program Audio 8 (AP8)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 32 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

The gain at any frequency in the band from 50 Hz to 15000 Hz will be within 1 dB of the gain at 1004 Hz.

(c) Signal-to-Idle Circuit Noise

The 15KC flat weighted idle circuit noise will be at least 54 dB below the received power of a 0 dBm 1004 Hz test tone transmitted at the far end.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(9) Program Audio 9 (AP9)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 14 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

The gain at any frequency in the band of 200-3000 Hz shall be within 4 dB of 1004 Hz loss.

(c) Signal-to-Idle Circuit Noise

The C-message weighted idle circuit noise will be less than 34 dBrn.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(10) Program Audio 10 (AP10)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 14 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

The gain at any frequency in the band of 100-5000 Hz shall be within 4 dB of 1004 Hz loss.

(c) Signal-to-Idle Circuit Noise

The C-message weighted idle circuit noise will be less than 34 dBm.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(C) Program Audio Services (Cont'd)

(11) Program Audio 11 (AP11)

(a) Actual Measured Loss (AML)

When the service is initiated, the 1004 Hz AML will be less than 14 dB or with the optional gain will be 0 ± 0.5 dB.

(b) Gain/Frequency Distortion

The gain at any frequency in the band of 50-8000 Hz shall be within 9 dB of 1004 Hz loss.

(c) Signal-to-Idle Circuit Noise

The C-message weighted idle circuit noise will be at less than 34 dBm.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(D) Wideband Analog Services

(1) Wideband Analog (WA1)

- Nominal Bandwidth

60 kHz to 108 kHz with pilot slot reserved at 104.08 kHz.

(2) Wideband Analog (WA2)

- Nominal Bandwidth

312 kHz to 552 kHz with pilot slot reserved at 315.92 kHz.

(3) Wideband Analog to Digital (WA1T)

- Transmission Performance

Provides two Special Access WA1 channels each with the performance shown for WA1 in (1) preceding.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(E) WATS Access Line Services

(1) Standard Transmission Performance

(a) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is ± 4.0 dB.

(b) Attenuation Distortion

The maximum Attenuation Distortion in the 404 to 2804 Hz frequency band relative to the loss at 1004 Hz is -3.0 dB to +9.0 dB.

(c) C-Message Noise

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

<u>Route Miles</u>	<u>C-Message Noise</u>
less than 50	35 dBmCO
51 to 100	37 dBmCO
101 to 200	40 dBmCO
201 to 400	43 dBmCO
401 to 1000	45 dBmCO

(d) Echo Path Loss

When provided in association with a two-wire interface, the Echo Path Loss, expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), is equal to or greater than:

ERL	6.0 dB
SRL	3.0 dB

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(E) WATS Access Line Services (Cont'd)

(2) Data Transmission Parameters

(a) Signal-to-C-Notched Noise

The minimum Signal-to-C-Notched Noise Ratio is 30 dB.

(b) Envelope Delay Distortion

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

1000 microseconds	604 to 2804 Hz
500 microseconds	1000 to 2404 Hz

(c) Impulse Noise Counts

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

(d) 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

(e) Phase Jitter

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

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

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15.2.1 Transmission Performance (Cont'd)

(E) WATS Access Line Services (Cont'd)

(2) Data Transmission Parameters (Cont'd)

(f) Frequency Shift

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

(3) Two-Wire Improved Voice Transmission Performance

(a) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is -4.0 dB to +4.0 dB.

(b) 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 +6.0 dB.

(c) C-Message Noise

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

<u>Route Miles</u>	<u>C-Message Noise</u>
less than 50	35 dBrnCO
51 to 100	37 dBrnCO
101 to 200	40 dBrnCO
201 to 400	43 dBrnCO
401 to 1000	45 dBrnCO

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(E) WATS Access Line Services (Cont'd)

(3) Two-Wire Improved Voice Transmission Performance (Cont'd)

(d) Return Loss

The Return Loss, expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), is equal to or greater than:

ERL 13.0 dB
SRL 6.0 dB

(4) Four-Wire Improved Voice Transmission Performance

(a) Loss Deviation

The maximum Loss Deviation of the 1004 Hz loss relative to the Expected Measured Loss (EML) is -4.0 dB to +4.0 dB.

(b) 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 +6.0 dB.

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(E) WATS Access Line Services (Cont'd)

(4) Four-Wire Improved Voice Transmission Performance (Cont'd)

(c) C-Message Noise

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

<u>Route Miles</u>	<u>C-Message Noise</u>
less than 50	35 dBmCO
51 to 100	37 dBmCO
101 to 200	40 dBmCO
201 to 400	43 dBmCO
401 to 1000	45 dBmCO

(d) Echo Path Loss

The Echo Path Loss, expressed as Echo Return Loss (ERL) and Singing Return Loss (SRL), is equal to or greater than:

ERL	16.0 dB
SRL	11.0 dB

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(F) Wideband Digital Services

(1) Wideband Digital (WD1)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 98.75%.

(2) Wideband Digital (WD2)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 98.75%.

(3) Wideband Digital (WD3)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 98.75%.

(4) Wideband Digital (WD4)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 98.75%.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(G) Digital Data Access Services

(1) Digital Data Access 1 (DA1)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 99.875%.

(2) Digital Data Access 2 (DA2)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 99.875%.

(3) Digital Data Access 3 (DA3)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 99.875%.

(4) Digital Data Access 4 (DA4)

- Error-Free Seconds

While in service, the monthly average of the error-free seconds will be equal to or greater than 99.875%.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.1 Transmission Performance (Cont'd)

(H) High Capacity Services

(1) High Capacity 1 (HC1)

- Error-Free Seconds

While in service, 98.75% of the one-second intervals will be error-free measured over a continuous 24 hour period.

(2) High Capacity 2 (HC2)

Reserved For Future Use.

(3) High Capacity 3 (HC3)

Reserved For Future Use.

(4) High Capacity 4 (HC4)

Reserved For Future Use.

(5) High Capacity 1C (HC1C)

Reserved For Future Use.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.2 Service Designator/Network Channel Code Conversion Table

The following table shows the relationship between the service designator codes (i.e. VG1, NB2, etc.) and the network channel codes that are used for various administrative purposes.

<u>Service Designator Code</u>	<u>Network Channel Code</u>
NB1	NT
NB2	NU
NB4	NW
NB5	NY
NB6	TS
NB7	TT
VG1	LB
VG2	LC
VG3	LD
VG5	LF
VG6	LG
VG7	LH
VG8	LJ
VG9	LK
VG10	LN
AP1	PE
AP2	PF
AP3	PJ
AP4	PK
AP5	MT
AP6	MT
AP7	MT
AP8	MT
AP9	MT
AP10	MT
AP11	MT
WA1	WJ
WA1T	WQ
WA2	WL

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

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

<u>Service Designator Code</u>	<u>Network Channel Code</u>
WALS (Standard)	SE
WALS (Improved)	SF
WD1	WB
WD2	WE
WD3	WF
WD4	WH
DA1	XA
DA2	XB
DA3	XG
DA4	XH
SR1	RB
SR2	RC
SR3	RD
HC1	HC
HC1C	HD
HC2	HE
HC3	HF
HC4	HG

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes

This section explains the facility interface codes set forth in Section 15.2.4 following that the IC can specify when ordering Special Access Service. Included is an example which explains the specific characters of the code, a glossary of facility interface codes and impedance levels.

Example: If the IC specifies a 2DC8-3 facility interface at the IC terminal location, it is requesting the following:

- 2 = Number of physical wires at IC terminal location
- DC = 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

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(A) Glossary of Facility Interface Codes and Options

<u>Code</u>	<u>Option</u>	<u>Definition</u>
AB	-	accepts 20 Hz ringing signal at IC point of interface
AC	-	accepts 20 Hz ringing signal at end user network interface
AH	-	analog high capacity interface
	- B	60 kHz to 108 kHz (12 channels)
	- C	312 kHz to 552 kHz (60 channels)
	- D	564 kHz to 3084 kHz (600 channels)
DA	-	data stream in VF frequency band at end user network interface
DB	-	data stream in VF frequency band at IC point of interface location
	- 10	VF for NB4 and NB5
	- 43	VF for 43 Telegraph Carrier type signals, NB4 and NB5
DC	-	direct current or voltage
	- 1	monitoring interface with series RC combination (McCulloch format)
	- 2	Telephone Company energized alarm channel
	- 3	Metallic facilities (DC continuity) for direct current/low frequency control signals or slow speed data (30 baud)
DD	-	DATAPHONE Select-A-Station (and TABS) interface at IC point of interface
DE	-	DATAPHONE Select-A-Station (and TABS) interface at the end user NI
DO	-	digital interface at IC terminal at the digital signal level zero A (DS-OA)

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(A) Glossary of Facility Interface Codes and Options (Cont'd)

<u>Code</u>	<u>Option</u>	<u>Definition</u>
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
	- 15K	1.544 Mbps format per PUB 41451 plus extended framing format
	- 15L	1.544 Mbps (DS1) with SF signaling
	- 27	274.176 Mbps (DS4)
	- 27L	274.176 Mbps (DS4) with SF signaling
	- 31	3.152 Mbps (DS1C)
	- 31L	3.152 Mbps (DS1C) with SF signaling
	- 44	44.736 Mbps (DS3)
	- 44L	44.736 Mbps (DS3) with SF signaling
	- 63	6.312 Mbps (DS2)
	- 63L	6.312 Mbps (DS2) with SF signaling
DU	-	digital access interface
	- 24	2.4 kbps
	- 48	4.8 kbps
	- 56	56.0 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

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(A) Glossary of Facility Interface Codes and Options (Cont'd)

<u>Code</u>	<u>Option</u>	<u>Definition</u>
DX	-	duplex signaling interface at IC POI
DY	-	duplex signaling interface at end user NI
EA	- E	Type I E&M Lead Signaling. IC at POI or end user at NI originates on E Lead.
EA	- M	Type I E&M Lead Signaling. IC at POI or end user at NI originates on M Lead.
EB	- E	Type II E&M Lead Signaling. IC at POI or end user at NI originates on E Lead.
EB	- M	Type II E&M Lead Signaling. IC at POI or end user at NI originates on M Lead.
EC	-	Type III E&M Signaling at IC terminal POI tandem
EX	- A	channel unit signaling for loop start or ground start and IC supplies open end (dial tone, etc.) functions
EX	- B	tandem channel unit signaling for loop start or ground start and IC supplies closed end (dial pulsing, etc.) functions
GO	-	ground start loop signaling - open end function by IC or end user
GS	-	ground start loop signaling - closed end function by IC or 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

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(A) Glossary of Facility Interface Codes and Options (Cont'd)

<u>Code</u>	<u>Option</u>	<u>Definition</u>
LC	-	end user loop start loop signaling - Type C OPS registered port open end
LO	-	loop start loop signaling - open end function by IC or end user
LR	-	20 Hz automatic ringdown interface at IC with Telephone Company provided PLAR
LS	-	loop start loop signaling - closed end function by IC or end user
NO	-	no signaling interface, transmission only
PG	-	program transmission - no dc signaling
	- 1	nominal frequency from 50 to 15000 Hz
	- 3	nominal frequency from 200 to 3500 Hz
	- 5	nominal frequency from 100 to 5000 Hz
	- 8	nominal frequency from 50 to 8000 Hz
RV	- 0	reverse battery signaling, one-way operation, originate by IC
	- T	reverse battery signaling, one-way operation, terminate by IC or end user
SF	-	single frequency signaling with VF band at either IC POI or end user NI
TF	-	telephotograph interface
TT	-	telegraph/teletypewriter interface at either IC POI or end user NI
	- 2	20.0 milliamperes
	- 3	3.0 milliamperes
	- 6	62.5 milliamperes

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(A) Glossary of Facility Interface Codes and Options (Cont'd)

<u>Code</u>	<u>Option</u>	<u>Definition</u>
WA	-	wideband bandwidth interface at end user NI
	- 1	limited bandwidth
	- 2	nominal passband from 29000 to 44000 Hz
WB	-	wideband data interface at IC POI
	- 18S	18.75 kbps, synchronous
	- 19A	up to 19.2 kbps asynchronous
	- 19S	19.2 kbps synchronous
	- 23A	up to 230.4 kbps, asynchronous
	- 23S	230.4 kbps, synchronous
	- 40S	40.8 kbps, synchronous
	- 50A	up to 50.0 kbps, asynchronous
	- 50S	50.0 kbps, synchronous
	- 64	64.0 kbps, restored polar
WC	-	wideband data interface at end user NI
	- 18	18.75 kbps, synchronous
	- 19	for 12-wire interface: 19.1 kbps, synchronous for 10-wire interface: up to 19.2 kbps, asynchronous
	- 23	up to 230.4 kbps, asynchronous
	- 23S	230.4 kbps, synchronous
	- 40	40.8 kbps, synchronous
	- 50	for 12-wire interface: 50.0 kbps, synchronous for 10-wire interface: up to 50.0 kbps, asynchronous
WD	-	wideband bandwidth interface at IC POI
	- 1	nominal passband from 300 to 18000 Hz
	- 2	nominal passband from 28000 to 44000 Hz
	- 3	nominal passband from 29000 to 44000 Hz

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(B) Impedance

The nominal reference impedance with which the IC or end user will terminate the channel for the purpose of evaluation transmission performance:

<u>Value (ohms)</u>	<u>Code(s)</u>
110	0
150	1
600	2
900	3 *
1200	4
135	5
75	6
124	7
Variable	8
100	9

* For those interface codes with a four-wire transmission path at the POI at the IC's terminal location, rather than a standard 900 ohm impedance the code (3) denotes an IC provided transmission equipment termination. Such terminations were provided to ICs in accordance with the F.C.C. Docket No. 20099 Settlement Agreement.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.3 Facility Interface Codes (Cont'd)

(C) Digital Hierarchy Facility Interface Codes (4DS9-)

This facility interface is available only to ICs that select the multiplexed four-wire DSX-1 or higher facility interface option at the IC terminal location and provide subsequent system and channel assignment data. The various digital bit rates in the digital hierarchy employ the facility interface code 4DS9 plus the speed options indicated below:

<u>Interface Code And Speed Option</u>	<u>Nominal Bit Rate (Mbps)</u>	<u>Digital Hierarchy Level</u>
4DS9-15	1.544	DS1
4DS9-15L	1.544	DS1
4DS9-31	3.152	DS1C
4DS9-31L	3.152	DS1C
4DS0-63	6.312	DS2
4DS0-63L	6.312	DS2
4DS6-44	44.736	DS3
4DS6-44L	44.736	DS3
4DS6-27	274.176	DS4
4DS6-27L	274.176	DS4

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations

This section identifies the available Facility Interface (FI) Combinations for Special Access Services described in Sections 7.4 through 7.11 preceding.

(A) Narrowband Services

The following table shows the available Facility Interface (FI) Combinations and the Narrowband Services with which they may be ordered.

<u>FI Combinations</u>		<u>Narrowband NB-</u>						
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	
2DC8-3	2DC8-3	X						
2DC8-2	2DC8-1		X					
2DC8-1	2DC8-2		X					
4DS9- {1}	2DC8-1		X					
4DS9- {1}	2DC8-2		X					
4AH6-D {2}	2DC8-2		X					
4AH5-B {2}	2DC8-1		X					
4AH5-B {2}	2DC8-2		X					
4AH6-C {2}	2DC8-2		X					
4AH6-D {2}	2DC8-1		X					
4AH6-C {2}	2DC8-1		X					
2TT2-2	2TT2-2				X			
2TT2-3	2TT2-2				X			
4TT2-2	4TT2-2				X			
2TT2-6	4TT2-2				X			
4TT2-6	2TT2-6				X			

{1} See Section 15.2.3(C) for explanation.

{2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(A) Narrowband Services (Cont'd)

<u>FI Combinations</u>		<u>Narrowband NB-</u>						
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	
2DB2-10	2TT2-2			X				
2DB2-43 {3}	2TT2-2			X				
4DB2-10	2TT2-2			X				
4DB2-43 {3}	2TT2-2			X				
2DB2-10	4TT2-2			X				
2DB2-43 {3}	4TT2-2			X				
4DB2-10	4TT2-2			X				
4DB2-43 {3}	4TT2-2			X				
2DB2-43 {3}	2TT2-6			X				
4DB2-43 {3}	2TT2-6			X				
4DS9- {1}	2TT2-2			X				
2DS9- {1}	4TT2-2			X				
4DS9- {1}	2TT2-6			X				
4DS9- {1}	4TT2-6			X				
4AH5-B {2}	2TT2-2			X				
4AH5-B {2}	4TT2-2			X				
4AH5-B {2}	2TT2-6			X				
4AH5-B {2}	4TT2-6			X				
4AH6-C {2}	2TT2-2			X				
4AH6-C {2}	4TT2-2			X				
4AH6-C {2}	2TT2-6			X				
4AH6-C {2}	4TT2-6			X				

{1} See Section 15.2.3(C) for explanation.

{2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

{3} Supplemental Channel Assignment information required.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(A) Narrowband Services (Cont'd)

<u>FI Combinations</u>		<u>Narrowband NB-</u>						
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	
4AH6-D {2}	2TT2-2			X				
4AH6-D {2}	4TT2-2			X				
4AH6-D {2}	2TT2-6			X				
4AH6-D {2}	4TT2-6			X				
2DB2-10	10IA2				X			
4DB2-10	10IA2				X			
2DB2-43 {3}	10IA2				X			
4DB2-43 {3}	10IA2				X			
4DS9- {1}	10IA2				X			
4AH5-B {2}	10IA2				X			
4AH6-C {2}	10IA2				X			
4AH6-D {2}	10IA2				X			
2TT2	4TT2					X		
2TT2	2TT2					X		
4TT2	4TT2					X		
10IA2	10IA2						X	

{1} See Section 15.2.3(C) for explanation.

{2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

{3} Supplemental Channel Assignment information required.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services

The following table shows the available Facility Interface (FI) Combinations and the Voice Grade Services with which they may be ordered.

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AB2	4AC2		X								
4AB3	4AC2		X								
4AB2	2AC2		X								
4AB3	2AC2		X								
2AB2	2AC2		X								
2AB3	2AC2		X								
4AB2	4SF2		X								
4AB3	4SF2		X								
4AH6-D {1}	4AC2		X								
4AH6-D {1}	2AC2		X								
4AHC-C {1}	4AC2		X								
4AH6-C {1}	2AC2		X								
4AH5-B {1}	4AC2		X								
4AH5-B {1}	2AC2		X								
4AH6-D {1}	6DA2					X				X	
4AH6-C {1}	6DA2					X				X	
4AH5-B {1}	6DA2					X				X	
4AH6-D {1}	4DE2				X						
4AH6-C {1}	4DE2				X						
4AH5-B {1}	4DE2				X						

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-D {1}	4DX3								X		
4AH6-C {1}	4DX3								X		
4AH5-B {1}	4DX3								X		
4AH5-D {1}	4DX2								X		
4AH6-C {1}	4DX2								X		
4AH5-B {1}	4DX2								X		
4AH6-D {1}	9DY2			X			X	X			
4AH6-D {1}	9DY3			X			X	X			
4AH6-D {1}	6DY2			X			X	X			
4AH6-D {1}	6DY3			X			X	X			
4AH6-D {1}	4DY2			X			X	X			
4AH6-D {1}	2DY2			X			X	X			
4AH6-C {1}	9DY2			X			X	X			
4AH6-C {1}	9DY3			X			X	X			
4AH6-C {1}	6DY2			X			X	X			
4AH6-C {1}	6DY3			X			X	X			
4AH6-C {1}	4DY2			X			X	X			
4AH6-C {1}	2DY2			X			X	X			
4AH5-B {1}	9DY2			X			X	X			
4AH5-B {1}	9DY3			X			X	X			
4AH5-B {1}	6DY2			X			X	X			
4AH5-B {1}	6DY3			X			X	X			
4AH5-B {1}	4DY2			X			X	X			
4AH5-B {1}	2DY2			X			X	X			

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-D {1}	9EA2			X			X	X			
4AH6-D {1}	9EA3			X			X	X			
4AH6-D {1}	6EA2-E			X			X	X			
4AH6-D {1}	6EA2-M			X			X	X	X		
4AH6-D {1}	4EA2-E			X			X	X			
4AH6-D {1}	4EA2-M			X			X	X			
4AH6-C {1}	9EA2			X			X	X			
4AH6-C {1}	9EA3			X			X	X			
4AH6-C {1}	6EA2-E			X			X	X			
4AH6-C {1}	6EA2-M			X			X	X	X		
4AH6-C {1}	4EA2-E			X			X	X			
4AH6-C {1}	4EA2-M			X			X	X			
4AH5-B {1}	9EA2			X			X	X			
4AH5-B {1}	9EA3			X			X	X			
4AH5-B {1}	6EA2-E			X			X	X			
4AH5-B {1}	6EA2-M			X			X	X	X		
4AH5-B {1}	4EA2-E			X			X	X			
4AH5-B {1}	4EA2-M			X			X	X			
4AH6-D {1}	8EB2-E			X			X	X			
4AH6-D {1}	8EB2-M			X			X	X	X		
4AH6-D {1}	6EB2-E			X			X	X			
4AH6-D {1}	6EB2-M			X			X	X			
4AH6-C {1}	8EB2-E			X			X	X			
4AH6-C {1}	8EB2-M			X			X	X	X		

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-C {1}	6EB2-E			X			X	X			
4AH6-C {1}	6EB2-M			X			X	X			
4AH5-B {1}	8EB2-E			X			X	X			
4AH5-B {1}	8EB2-M			X			X	X	X		
4AH5-B {1}	6EB2-E			X			X	X			
4AH5-B {1}	6EB2-M			X			X	X			
4AH6-D {1}	2G02	X									
4AH6-C {1}	2G02	X									
4AH5-B {1}	2G02	X									
4AH6-D {1}	6GS2			X			X				
4AH6-D {1}	4GS2			X			X				
4AH6-D {1}	2GS3			X			X				
4AH6-D {1}	2GS2	X		X			X				
4AH6-C {1}	6GS2			X			X				

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel Assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-C {1}	4GS2			X			X				
4AH6-C {1}	2GS3			X			X				
4AH6-C {1}	2GS2	X		X			X				
4AH5-B {1}	6GS2			X			X				
4AH5-B {1}	4GS2			X			X				
4AH5-B {1}	2GS3			X			X				
4AH5-B {1}	2GS2	X		X			X				
4AH6-D {1}	2LA2		X				X				
4AH6-C {1}	2LA2		X				X				
4AH5-B {1}	2LA2		X				X				
4AH6-D {1}	2LB2		X				X				
4AH6-C {1}	2LB2		X				X				
4AH5-B {1}	2LB2		X				X				
4AH6-D {1}	2LC2		X				X				
4AH6-C {1}	2LC2		X				X				
4AH5-B {1}	2LC2		X				X				
4AH6-D {1}	2LO3		X				X				
4AH6-D {1}	2LO2	X									
4AH6-C {1}	2LO3		X				X				
4AH6-C {1}	2LO2	X									
4AH5-B {1}	2LO3		X				X				
4AH5-B {1}	2LO2	X									

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel Assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-D {1}	4LR2		X								
4AH6-D {1}	2LR2		X								
4AH6-C {1}	4LR2		X								
4AH6-C {1}	2LR2		X								
4AH5-B {1}	4LR2		X								
4AH5-B {1}	2LR2		X								
4AH6-D {1}	6LS2		X	X			X				
4AH6-D {1}	4LS2		X	X			X				
4AH6-D {1}	2LS2	X	X	X			X	X			
4AH6-D {1}	2LS3		X	X			X				
4AH6-C {1}	6LS2		X	X			X				
4AH6-C {1}	4LS2		X	X			X				
4AH6-C {1}	2LS2	X	X	X			X	X			
4AH6-C {1}	2LS3		X	X			X				
4AH5-B {1}	6LS2		X	X			X				
4AH5-B {1}	4LS2		X	X			X				
4AH5-B {1}	2LS2	X	X	X			X	X			
4AH5-B {1}	2LS3		X	X			X				
4AH6-D {1}	4NO2	X	X		X	X	X		X		
4AH6-D {1}	2NO2	X	X		X		X				
4AH6-C {1}	4NO2	X	X		X	X	X		X		
4AH6-C {1}	2NO2	X	X		X		X				
4AH5-B {1}	4NO2	X	X		X	X	X		X		
4AH5-B {1}	2NO2	X	X		X		X				

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel Assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4AH6-D {1}	4RV2-T			X			X				
4AH6-D {1}	2RV2-T			X			X				
4AH6-C {1}	4RV2-T			X			X				
4AH6-C {1}	2RV2-T			X			X				
4AH5-B {1}	4RV2-T			X			X				
4AH5-B {1}	2RV2-T			X			X				
4AH6-D {1}	4SF2		X	X			X	X	X		
4AH6-C {1}	4SF2		X	X			X	X	X		
4AH5-B {1}	4SF2								X		
4AH6-D {1}	4SF3								X		
4AH6-C {1}	4SF3								X		
4AH5-B {1}	4SF3								X		
6DA2 {1}	6DA2									X	
6DA2 {1}	4DA2									X	
4DA2 {1}	6DA2									X	
4DA2 {1}	4DA2									X	
4DB2 {1}	6DA2						X			X	
4DB2 {1}	4NO2					X					
4DD3 {1}	4DE2				X						
2DD3 {1}	2DE2				X						

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel Assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4DS9- {1}	4AC2		X								
4DS9- {1}	2AC2		X								
4DS9- {1}	6DA2					X				X	
4DS9- {1}	4DE2				X						
4DS9- {1}	4DX3									X	
4DS9- {1}	4DX2									X	
4DS9- {1}	9DY3			X			X	X			
4DS9- {1}	9DY2			X			X	X			
4DS9- {1}	6DY3			X			X	X			
4DS9- {1}	6DY2			X			X	X			
4DS9- {1}	4DY2			X			X	X			
4DS9- {1}	2DY2			X			X	X			
4DS9- {1}	9EA2			X			X	X			
4DS9- {1}	9EA3			X			X	X			
4DS9- {1}	6EA2-E			X			X	X			
4DS9- {1}	6EA2-M			X			X	X	X		
4DS9- {1}	4EA2-E			X			X	X			
4DS9- {1}	4EA2-M			X			X	X			
4DS9- {1}	8EB2-E			X			X	X			
4DS9- {1}	8EB2-M			X			X	X	X		
4DS9- {1}	6EB2-E			X			X	X			
4DS9- {1}	6EB2-M			X			X	X			
4DS9- {1}	2GO2		X								

{1} See Section 15.2.3(C) for explanation.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4DS9- {1}	6GS2			X			X				
4DS9- {1}	4GS2			X			X				
4DS9- {1}	2GS2	X		X			X				
4DS9- {1}	2GS3			X			X				
4DS9- {1}	2LA2		X				X				
4DS9- {1}	2LB2		X				X				
4DS9- {1}	2LC2		X				X				
4DS9- {1}	2LO2	X									
4DS9- {1}	2LO3		X				X				
4DS9- {1}	4LR2		X								
4DS9- {1}	2LR2		X								
4DS9- {1}	6LS2		X	X			X				
4DS9- {1}	4LS2		X	X			X				
4DS9- {1}	2LS2	X	X	X			X	X			
4DS9- {1}	2LS3		X	X			X				
4DS9- {1}	4NO2	X	X		X	X	X		X		
4DS9- {1}	2NO2	X	X		X		X				
4DS9- {1}	4RV2-T			X				X			
4DS9- {1}	2RV2-T			X				X			
4DS9- {1}	4SF2		X	X			X	X	X		
4DS9- {1}	4SF3								X		

{1} See Section 15.2.3(C) for explanation.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4DX2	4DX2								X		
4DX3	4DX2								X		
4DX2	4DX3								X		
4DX3	4DX3								X		
6DX2	9DY3			X			X	X			
6DX2	9DY2			X			X	X			
6DX2	6DY3			X			X	X			
6DX2	6DY2			X			X	X			
6DX2	4DY2			X			X	X			
6DX2	2DY2			X			X	X			
4DX2	9DY3			X			X	X			
4DX3	9DY3			X			X	X			
4DX2	9DY2			X			X	X			
4DX3	9DY2			X			X	X			
4DX2	6DY3			X			X	X			
4DX3	6DY3			X			X	X			
4DX2	6DY2			X			X	X			
4DX3	6DY2			X			X	X			
4DX2	4DY2			X			X	X			
4DX3	4DY2			X			X	X			
4DX2	2DY2			X			X	X			
4DX3	2DY2			X			X	X			
6DX2	9EA3			X			X	X			
6DX2	9EA2			X			X	X			
6DX2	6EA2-E			X			X	X			
6DX2	6EA2-M			X			X	X			
6DX2	4EA2-E			X			X	X			
6DX2	4EA2-M			X			X	X			

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4DX2	9EA2			X			X	X			
4DX3	9EA2			X			X	X			
4DX2	9EA3			X			X	X			
4DX3	9EA3			X			X	X			
4DX2	6EA2-E			X			X	X			
4DX3	6EA2-E			X			X	X			
4DX2	6EA2-M			X			X	X	X		
4DX3	6EA2-M			X			X	X	X		
4DX2	4EA2-E			X			X	X			
4DX3	4EA2-E			X			X	X			
4DX2	4EA2-M			X			X	X			
4DX3	4EA2-M			X			X	X			
6DX2	8EB2-E			X			X	X			
6DX2	8EB2-M			X			X	X			
6DX2	6EB2-E			X			X	X			
6DX2	6EB2-M			X			X	X			
4DX2	8EB2-E			X			X	X			
4DX2	8EB2-M			X			X	X	X		
4DX3	8EB2-E			X			X	X			
4DX3	8EB2-M			X			X	X	X		
4DX2	6EB2-E			X			X	X			
4DX2	6EB2-M			X			X	X			
4DX3	6EB2-E			X			X	X			
4DX3	6EB2-M			X			X	X			
4DX2	2LA2		X				X				
4DX3	2LA2		X				X				
2DX3	2LA2		X				X				
4DX2	2LB2		X				X				
4DX3	2LB2		X				X				
2DX3	2LB2		X				X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4DX2	2LC2		X				X				
4DX3	2LC2		X				X				
2DX3	2LC2		X				X				
4DX2	2LO3		X				X				
4DX3	2LO3		X				X				
2DX3	2LO3		X				X				
4DX2	6LS2		X	X			X				
4DX3	6LS2		X	X			X				
4DX3	4LS2		X	X			X				
4DX2	4LS2		X	X			X				
4DX3	2LS3		X	X			X				
4DX2	2LS3		X	X			X				
4DX3	2LS2		X	X			X	X			
4DX2	2LS2		X	X			X	X			
2DX3	2LS2		X	X			X				
2DX3	2LS3		X	X			X				
4DX3	4RV2-T			X			X				
4DX2	4RV2-T			X			X				
4DX3	2RV2-T			X			X				
4DX2	2RV2-T			X			X				
6DX2	4SF2			X			X	X			
4DX2	4SF2		X	X			X	X	X		
4DX3	4SF2		X	X			X	X	X		
4DX2	4SF3								X		
4DX3	4SF3								X		
6EA2-E	4AC2		X								
6EA2-M	4AC2		X								
6EA2-E	2AC2		X								
6EA2-M	2AC2		X								

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
6EA2-E	4DX2									X	
6EA2-M	4DX2									X	
6EA2-E	4DX3									X	
6EA2-M	4DX3									X	
6EA2-E	9DY3			X			X	X			
6EA2-E	9DY2			X			X	X			
6EA2-E	6DY3			X			X	X			
6EA2-E	6DY2			X			X	X			
6EA2-E	4DY2			X			X	X			
6EA2-M	9DY3			X			X	X			
6EA2-M	9DY2			X			X	X			
6EA2-M	6DY3			X			X	X			
6EA2-M	6DY2			X			X	X			
6EA2-M	4DY2			X			X	X			
6EA2-M	2DY2			X			X	X			
6EA2-E	2DY2			X			X	X			
4EA3-E	9DY3			X			X				
4EA3-E	9DY2			X			X				
4EA3-E	6DY3			X			X				
4EA3-E	6DY2			X			X				
4EA3-E	4DY2			X			X				
4EA3-E	2DY2			X			X				

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15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		1	2	3	5	6	7	8	9	10	
6EA2-E	9EA2				X			X	X			
6EA2-E	9EA3				X			X	X			
6EA2-M	9EA2				X			X	X			
6EA2-M	9EA3				X			X	X			
6EA2-E	6EA2-E				X			X	X			
6EA2-E	6EA2-M				X			X	X	X		
6EA2-M	6EA2-E				X			X	X			
6EA2-M	6EA2-M				X			X	X	X		
6EA2-E	4EA2-E				X			X	X			
6EA2-E	4EA2-M				X			X	X			
6EA2-M	4EA2-E				X			X	X			
6EA2-M	4EA2-M				X			X	X			
4EA3-E	6EA2-E				X			X				
4EA3-E	6EA2-M				X			X				
4EA3-E	4EA2-E				X			X				
4EA3-E	4EA2-M				X			X				
4EA3-E	9EA2				X			X				
4EA3-E	9EA3				X			X				
6EA2-E	8EB2-E				X			X	X			
6EA2-E	8EB2-M				X			X	X	X		
6EA2-E	6EB2-E				X			X	X			
6EA2-E	6EB2-M				X			X	X			
6EA2-M	8EB2-E				X			X	X			
6EA2-M	8EB2-M				X			X	X	X		
6EB3-E	6EB2-E				X			X				
6EB3-E	6EB2-M				X			X				
6EA2-M	6EB2-E				X			X	X			
6EA2-M	6EB2-M				X			X	X			
4EA3-E	8EB2-E				X			X				
4EA3-E	8EB2-M				X			X				
4EA3-E	6EB2-E				X			X				
4EA3-E	6EB2-M				X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

FI Combinations		Voice Grade VG-									
IC	End User	1	2	3	5	6	7	8	9	10	
6EA2-E	2LA2		X				X				
6EA2-M	2LA2		X				X				
6EA2-E	2LB2		X				X				
6EA2-M	2LB2		X				X				
6EA2-E	2LC2		X				X				
6EA2-M	2LC2		X				X				
6EA2-E	2LO3		X				X				
6EA2-M	2LO3		X				X				
6EA2-E	6LS2		X	X			X				
6EA2-M	6LS2		X	X			X				
6EA2-E	4LS2		X	X			X				
6EA2-M	4LS2		X	X			X				
6EA2-E	2LS2		X	X			X	X			
6EA2-M	2LS2		X	X			X	X			
6EA2-E	2LS3		X	X			X				
6EA2-M	2LS3		X	X			X				
6EA2-E	4RV2-T		X				X				
6EA2-M	4RV2-T		X				X				
6EA2-E	2RV2-T		X				X				
6EA2-M	2RV2-T		X				X				
6EA2-E	4SF3									X	
6EA2-M	4SF3									X	
6EA2-E	4SF2		X	X			X	X	X		
6EA2-M	4SF2		X	X			X	X	X		
4EA3-E	4SF2			X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
8EB2-E	4AC2		X								
8EB2-M	4AC2		X								
8EB2-E	2AC2		X								
8EB2-M	2AC2		X								
8EB2-E	4DX2								X		
8EB2-M	4DX2								X		
8EB2-E	4DX3								X		
8EB2-M	4DX3								X		
8EB2-E	9DY3			X			X	X			
8EB2-E	9DY2			X			X	X			
8EB2-E	6DY3			X			X	X			
8EB2-E	6DY2			X			X	X			
8EB2-E	4DY2			X			X	X			
8EB2-E	2DY2			X			X	X			
8EB2-M	9DY3			X			X	X			
8EB2-M	9DY2			X			X	X			
8EB2-M	6DY3			X			X	X			
8EB2-M	6DY2			X			X	X			
8EB2-M	4DY2			X			X	X			
8EB2-M	2DY2			X			X	X			
6EB3-E	9DY2			X			X				
6EB3-E	9DY3			X			X				
6EB3-E	6DY2			X			X				
6EB3-E	6DY3			X			X				
6EB3-E	2DY2			X			X				
6EB3-E	4DY2			X			X				

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15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		1	2	3	5	6	7	8	9	10	
8EB2-E	9EA2				X			X	X			
8EB2-E	9EA3				X			X	X			
8EB2-M	9EA2				X			X	X			
8EB2-M	9EA3				X			X	X			
8EB2-E	6EA2-E				X			X	X			
8EB2-E	6EA2-M				X			X	X	X		
8EB2-M	6EA2-E				X			X	X			
8EB2-M	6EA2-M				X			X	X	X		
8EB2-E	4EA2-E				X			X	X			
8EB2-E	4EA2-M				X			X	X			
8EB2-M	4EA2-E				X			X	X			
8EB2-M	4EA2-M				X			X	X			
6EB3-E	9EA2				X			X				
6EB3-E	9EA3				X			X				
6EB3-E	6EA2-E				X			X				
6EB3-E	6EA2-M				X			X				
6EB3-E	4EA2-E				X			X				
6EB3-E	4EA2-M				X			X				
8EB2-E	8EB2-E				X			X	X			
8EB2-E	8EB2-M				X			X	X	X		
8EB2-M	8EB2-E				X			X	X			
8EB2-M	8EB2-M				X			X	X	X		
6EB2-E	8EB2-E				X			X				
6EB2-E	8EB2-M				X			X				
6EB2-M	8EB2-E				X			X				
6EB2-M	8EB2-M				X			X				
6EB3-E	8EB2-E				X			X				
6EB3-E	8EB2-M				X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
8EB2-E	2LA2			X				X				
8EB2-M	2LA2			X				X				
8EB2-E	2LB2			X				X				
8EB2-M	2LB2			X				X				
8EB2-E	2LC2			X				X				
8EB2-M	2LC2			X				X				
8EB2-E	2LO3			X				X				
8EB2-M	2LO3			X				X				
8EB2-E	6LS2			X	X			X				
8EB2-M	6LS2			X	X			X				
8EB2-E	4LS2			X	X			X				
8EB2-M	4LS2			X	X			X				
8EB2-E	2LS2			X	X			X	X			
8EB2-M	2LS2			X	X			X	X			
8EB2-E	2LS3			X	X			X				
8EB2-M	2LS3			X	X			X				
8EB2-E	4RV2-T			X				X				
8EB2-M	4RV2-T			X				X				
8EB2-E	2RV2-T			X				X				
8EB2-M	2RV2-T			X				X				
8EB2-E	4SF2			X	X			X	X	X		
8EB2-M	4SF2			X	X			X	X	X		
8EB2-E	4SF3									X		
8EB2-M	4SF3									X		
6EB3-E	4SF2				X			X				

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15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		1	2	3	5	6	7	8	9	10	
8EC2	9DY2				X			X	X			
8EC2	9DY3				X			X	X			
8EC2	6DY2				X			X	X			
8EC2	6DY3				X			X	X			
8EC2	4DY2				X			X	X			
8EC2	2DY2				X			X	X			
8EC2	9EA2				X			X	X			
8EC2	9EA3				X			X	X			
8EC2	6EA2-E				X			X	X			
8EC2	6EA2-M				X			X	X			
8EC2	4EA2-E				X			X	X			
8EC2	4EA2-M				X			X	X			
8EC2	8EB2-E				X			X	X			
8EC2	8EB2-M				X			X	X			
8EC2	6EB2-E				X			X	X			
8EC2	6EB2-M				X			X	X			
8EC2	4SF2				X			X	X			
6EX2-A	6GS2				X			X				
6EX2-A	4GS2				X			X				
6EX2-A	2GS2				X			X				
6EX2-A	2GS3				X			X				
6EX2-B	2LA2			X				X				
6EX2-B	2LB2			X				X				
6EX2-B	2LC2			X				X				
6EX2-B	2LO2		X									
6EX2-B	2LO3			X				X				

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15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		1	2	3	5	6	7	8	9	10	
6EX2-B	4LR2			X								
6EX2-B	2LR2			X								
6EX2-A	6LS2			X	X			X				
6EX2-A	4LS2			X	X			X				
6EX2-A	2LS2		X	X	X			X				
6EX2-A	2LS3			X	X			X				
6EX2-A	4SF2			X		X		X				
6EX2-B	4SF2			X								
6GO2	6CS2				X			X				
6GO2	4GS2				X			X				
6GO2	2GS2		X		X			X				
6GO2	2GS3				X			X				
4GO2	6GS2				X			X				
4GO3	6GS2				X			X				
4GO2	4GS2				X			X				
4GO3	4GS2				X			X				
4GO2	2GS2		X		X			X				
4GO2	2GS3				X			X				
4GO3	2GS2		X		X			X				
4GO3	2GS3				X			X				
2GO2	2GS2		X		X			X				
2GO3	2GS2		X		X			X				
2GO2	2GS3				X			X				
2GO3	2GS3				X			X				
6GO2	4SF2				X			X				
4GO2	4SF2				X			X				
4GO3	4SF2				X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

IC	FI Combinations		Voice Grade VG-									
	End User		1	2	3	5	6	7	8	9	10	
6GS2	2GO2		X									
4GS2	2GO2		X									
4GS3	2GO2		X									
2GS2	2GO2		X									
2GS3	2GO2		X									
6LO2	6LS2			X	X			X				
6LO2	4LS2			X	X			X				
6LO2	2LS2		X	X	X			X				
6LO2	2LS3			X	X			X				
4LO2	6LS2			X	X			X				
4LO2	4LS2			X	X			X				
4LO3	6LS2			X	X			X				
4LO3	4LS2			X	X			X				
4LO3	2LS3			X	X			X				
4LO3	2LS2		X	X	X			X				
4LO2	2LS2		X	X	X			X				
4LO2	2LS3			X	X			X				
2LO3	2LS3			X	X			X				
2LO3	2LS2		X	X	X			X	X			
2LO2	2LS2		X	X	X			X	X			
2LO2	2LS3			X	X			X				
6LO2	4SF2			X	X			X				
4LO2	4SF2			X	X			X				
4LO3	4SF2			X	X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

FI Combinations		Voice Grade VG-									
IC	End User	1	2	3	5	6	7	8	9	10	
4LR3	4LR2		X								
4LR3	2LR2		X								
4LR2	4LR2		X								
4LR2	2LR2		X								
2LR2	2LR2		X								
2LR3	2LR2		X								
4LR2	4SF2		X								
4LR3	4SF2		X								
6LS2	2LA2		X					X			
4LS2	2LA2		X					X			
4LS3	2LA2		X					X			
2LS2	2LA2		X					X			
2LS3	2LA2		X					X			
6LS2	2LB2		X					X			
4LS2	2LB2		X					X			
4LS3	2LB2		X					X			
2LS2	2LB2		X					X			
2LS3	2LB2		X					X			
6LS2	2LC2		X					X			
4LS2	2LC2		X					X			
4LS3	2LC2		X					X			
2LS2	2LC2		X					X			
2LS3	2LC2		X					X			

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
6LS2	2L03		X					X			
6LS2	2L02	X									
4LS2	2L02	X									
4LS2	2L03		X					X			
4LS3	2L02	X									
4LS3	2L03		X					X			
2LS2	2L02	X									
2LS3	2L02	X									
2LS2	2L03		X					X			
2LS3	2L03		X					X			
6LS2	4SF2		X								
4LS3	4SF2		X								
4NO2	6DA2						X			X	
4NO2	4DA2						X			X	
4NO2	2DA2						X				
4NO2	4NO2	X	X		X	X	X		X		
4NO2	2NO2	X	X		X		X				
2NO2	2NO2	X	X		X		X				
2NO3	2NO2	X	X		X		X				
4RV2-O	4RV2-T				X			X			
4RV2-O	2RV2-T				X			X			
2RV2-O	2RV2-T				X			X			
4RV2-O	4SF2				X			X			

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15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4SF2	4AC2		X								
4SF3	4DX3								X		
4SF3	4DX2								X		
4SF2	4DX2								X		
4SF2	4DX3								X		
4SF3	9DY3			X			X	X			
4SF2	9DY2			X			X	X			
4SF3	9DY2			X			X	X			
4SF2	9DY3			X			X	X			
4SF3	6DY3			X			X	X			
4SF2	6DY2			X			X	X			
4SF2	6DY3			X			X	X			
4SF3	6DY2			X			X	X			
4SF2	4DY2			X			X	X			
4SF3	4DY2			X			X	X			
4SF3	2DY2			X			X	X			
4SF2	2DY2			X			X	X			

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4SF2	9EA2			X			X	X			
4SF3	9EA2			X			X	X			
4SF2	9EA3			X			X	X			
4SF3	9EA3			X			X	X			
4SF2	6EA2-E			X			X	X			
4SF2	6EA2-M			X			X	X	X		
4SF3	6EA2-E			X			X	X			
4SF3	6EA2-M			X			X	X	X		
4SF2	4EA2-E			X			X	X			
4SF2	4EA2-M			X			X	X			
4SF3	4EA2-E			X			X	X			
4SF3	4EA2-M			X			X	X			
4SF2	8EB2-E			X			X	X			
4SF2	8EB2-M			X			X	X	X		
4SF3	8EB2-E			X			X	X			
4SF3	8EB2-M			X			X	X	X		
4SF2	6EB2-E			X			X				
4SF2	6EB2-M			X			X				
4SF3	6EB2-E			X			X				
4SF3	6EB2-M			X			X				
4SF3	6GS2			X			X				
4SF2	6GS2			X			X				
4SF2	4GS2			X			X				
4SF3	4GS2			X			X				
4SF2	2GS2		X	X			X				
4SF2	2GS3			X			X				
4SF3	2GS2		X	X			X				
4SF3	2GS3			X			X				
4SF2	2LA2			X			X				
4SF3	2LA2			X			X				

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(B) Voice Grade Services (Cont'd)

<u>FI Combinations</u>		<u>Voice Grade VG-</u>									
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
4SF2	2LB2		X				X				
4SF3	2LB2		X				X				
4SF2	2LC2		X				X				
4SF3	2LC2		X					X			
4SF2	2LO3			X			X				
4SF3	2LO2	X									
4SF3	2LO2	X									
4SF3	2LO3		X				X				
4SF2	4LR2		X								
4SF2	2LR2		X								
4SF3	4LR2		X								
4SF3	2LR2		X								
4SF3	6LS2		X	X			X				
4SF2	6LS2		X	X			X				
4SF2	4LS2		X	X			X				
4SF3	4LS2		X	X			X				
4SF2	2LS2		X	X			X	X			
4SF2	2LS3		X	X			X				
4SF3	2LS2		X	X			X	X			
4SF3	2LS3		X	X			X				
4SF3	4RV2-T			X			X				
4SF2	4RV2-T			X			X				
4SF2	2RV2-T			X			X				
4SF3	2RV2-T			X			X				
4SF3	4SF3									X	
4SF3	4SF2		X	X			X	X	X		
4SF2	4SF2		X	X			X	X	X		
4SF2	4SF3									X	

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(C) Program Audio Services

The following table shows the available Facility Interface (FI) Combinations and the Program Audio Services with which they may be ordered.

IC	FI Combinations		Program Audio AP-										
		End User	1	2	3	4	5	6	7	8	9	10	11
2PG2-3		2PG2-3	X										
4DS9-15E	{1}	2PG2-3	X										
4AH5-B	{2}	2PG2-3	X										
4AH6-C	{2}	2PG2-3	X										
4AH6-D	{2}	2PG2-3	X										
2PG2-3		2PG1-3	X										
4DS9-15E	{1}	2PG1-3	X										
4AH5-B	{2}	2PG1-3	X										
4AH6-C	{2}	2PG1-3	X										
4AH6-D	{2}	2PG1-3	X										

{1} Available only to ICs selecting the multiplexed four-wire DSX facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

{2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(C) Program Audio Services (Cont'd)

<u>FI Combinations</u>		<u>Program Audio AP-</u>										
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>
2PG2-5	2PG2-5		X									
4DS9-15F {1}	2PG2-5		X									
4AH5-B {2}	2PG2-5		X									
4AH6-C {2}	2PG2-5		X									
4AH6-D {2}	2PG2-5		X									
2PG2-5	2PG1-5		X									
4DS9-15F {1}	2PG1-5		X									
4AH5-B {2}	2PG1-5		X									
4AH6-C {2}	2PG1-5		X									
4AH6-D {2}	2PG1-5		X									

- {1} Available only to ICs selecting the multiplexed four-wire DSX facility interface option at the IC terminal location and providing subsequent system and channel assignment data.
- {2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data. Channels 5 and 6 are assigned for AP2.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(C) Program Audio Services (Cont'd)

IC	FI Combinations		Program Audio AP-										
		End User	1	2	3	4	5	6	7	8	9	10	11
2PG2-8		2PG2-8			X								
4DS9-15E	{1}	2PG2-8			X								
4AH5-B	{2}	2PG2-8			X								
4AH6-C	{2}	2PG2-8			X								
4AH6-D	{2}	2PG2-8			X								
2PG2-8		2PG1-8			X								
4DS9-15E	{1}	2PG1-8			X								
4AH5-B	{2}	2PG1-8			X								
4AH6-C	{2}	2PG1-8			X								
4AH6-D	{2}	2PG1-8			X								
2PG2-1		2PG2-1				X							
4DS9-15H	{1}	2PG2-1				X							
2PG2-1		2PG1-1				X							
4DS9-15H	{1}	2PG1-1				X							
2PG2		2PG2					X	X	X	X	X	X	X

{1} Available only to ICs selecting the multiplexed four-wire DSX facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

{2} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data. Channels 5, 6 and 7 are assigned for AP3.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(D) Wideband Analog Services

The following table shows the available Facility Interface (FI) Combinations and the Wideband Analog Services with which they may be ordered.

<u>FI Combinations</u>		<u>Wideband Analog WA-</u>	
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>
4AH5-B	4AH5-B	X	
4AH6-C {1}	4AH5-B	X	
4AH6-D {1}	4AH5-B	X	
4AH6-C	4AH6-C		X
4AH6-D {1}	4AH6-C {2}		X

{1} Available only to ICs selecting the multiplexed four-wire High Capacity analog facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

{2} Available only via a Telephone Company designated HUB where multiplexing is offered.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(E) WATS Access Line Services

WATS Access Line Service is available with either loop start or ground start facility interfaces at the end user premises. The codes for these are as follows:

2LS2 or 2GS2
4LS2 or 4GS2

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(F) Wideband Digital Services

The following table shows the available Facility Interface (FI) Combinations and the Wideband Digital Services with which they may be ordered.

<u>FI Combinations</u>		<u>Wideband Digital WD-</u>			
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
8WB5-19S	12WC6-19	X			
8WB5-18S	12WC6-18	X			
8WB5-19A	10WC6-19	X			
8WB5-50S	12WC6-50		X		
8WB5-40S	12WC6-40		X		
8WB5-50A	10WC6-50		X		
8WB5-23S	12WC6-23S			X	
8WB5-23A	10WC6-23			X	
4WB5-64	6DU5-56				X
4DO5	6DU5-56				X

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(G) Digital Data Access Services

The following table shows the available Facility Interface (FI) Combinations and the Digital Data Services with which they may be ordered.

<u>FI Combinations</u>		<u>Digital Data Access DA-</u>			
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
4DS9-15 {1}	6DU5-24	X			
6DU5-24	6DU5-24	X			
4DS9-15 {1}	6DU5-48		X		
6DU5-48	6DU5-48		X		
4DS9-15 {1}	6DU5-96			X	
6DU5-96	6DU5-96			X	
4DS9-15 {1}	6DU5-56				X
6DU5-56	6DU5-56				X

{1} Available only to ICs selecting the multiplexed four-wire DSX facility interface option at the IC terminal location and providing subsequent system and channel assignment data.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.2 Special Access Service (Cont'd)

15.2.4 Available Facility Interface (FI) Combinations (Cont'd)

(H) High Capacity Services

The following table shows the available Facility Interface (FI) Combinations and the High Capacity Services with which they may be ordered.

<u>FI Combinations</u>		<u>High Capacity HC-</u>				
<u>IC</u>	<u>End User</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>IC</u>
4DS9-15J	6DU9-A	X				
4DS9-15	6DU9-B	X				
4DS9-15K	6DU9-B	X				
4DS9-15K	6DU9-C	X				
4DS9-31 {1}	6DU9-A,B,C	X				
4DS0-63 {1}	6DU9-A,B,C	X				
4DS6-44 {1}	6DU9-A,B,C	X				
4DS6-27 {1}	6DU9-A,B,C	X				
4DS9-31 {2}	4DS9-31					X
4DS0-63 {2}	4DS0-63		X			
4DS6-44 {2}	4DS6-44			X		
4DS6-27 {2}	4DS6-27				X	

{1} Available only to ICs selecting the multiplexed four-wire DSX facility interface option of the IC terminal location and providing subsequent system and channel assignment data.

{2} See Section 7.2.8(B) preceding for explanation.

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15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.3 Directory Access Service

15.3.1 Interface Group and Premise Interface Codes

When Directory Access Service is combined with FGB, FGC, or FGD Switched Access Service, the Premises Interface Code for the combination will be the available Premises Interface Code provided for the FGB, FGC, or FGD Switched Access Service ordered by the customer. Premises Interface Codes are described in Section 15.1.1(F) preceding.

When Directory Access Service is provided as a separate trunk group (not in combination with Switched Access Service) Interface Groups 2 through 10 as set forth in Section 15.1.1 preceding are available. Only the following Premises Interface Codes are available when Directory Access Service is provided as a separate trunk group:

4DS9-15	6EA2-E	4RV2-0
4DS9-31	6EA2-M	4AH5-B
4DS0-63	4SF3	4AH6-C
4DS6-44		4AH6-D
4DS6-27		

ACCESS SERVICE

15. Access Service Interfaces and Transmission Specifications (Cont'd)

15.3 Directory Access Service (Cont'd)

15.3.2 Standard Transmission Specifications

Following is a matrix illustrating the transmission specifications available with Directory Access Service. Descriptions of the Standard Transmission Specifications, Type A and Type B, are set forth respectively in Section 15.1.2(E) and (F) preceding.

	<u>Transmission Specifications</u>	
	<u>Type A</u>	<u>Type B</u>
<u>Directory Access Service Provided in Combination with Switched Access Service</u>		
- FGB (Interface Groups 2 through 10)		X
- FGC		X
- FGD	X	
 <u>Directory Access Service Not Combined with Switched Access Service</u>		
- Routed Direct to DA location (Interface Groups 2 through 10)		X
- Routed via an access tandem (Interface Groups 2 through 10)	X	