

Dedicated Wavelength Ring (DWR)

A. General

This section contains definitions, terms, conditions and charges applicable to the provision of Dedicated Wavelength Ring (DWR) Service furnished by Verizon Maryland LLC, where conditions and facilities permit.

B. Terms and Conditions

Dedicated Wavelength Ring (DWR) provides managed optical transport of multiple protocols which are transmitted over a single fiber optic pair. DWR is configured in a diversely routed ring architecture or topology and can be arranged as a full (closed) ring or as a partial ring. The ring architecture allows for point-to-point optical services of varying wavelengths to be multiplexed on or off of the ring.

DWR allows for the native transmission of multiple high-speed protocols of various wavelengths over a single customized network. The wavelengths are arranged in a channelized format such that the protocol transmitted over each channel is independent of every other channel on the DWR. The customer must specify, by channel, the interface that defines the transmission speed and protocol being transmitted over the associated wavelength.

The Dedicated Wavelength Ring (DWR) is comprised of nodes, ring mileage, network optimization (amplification), high-speed (pass-through) interfaces (certain partial ring configurations only), and optical transport channels.

1. Full Ring

A DWR full (closed) ring provides connectivity to multiple customer designated locations (nodes). A full ring must have a minimum of three nodes at different locations or two nodes at different locations with a network optimization mid-span amplifier. At least one of the devices (node or amplifier) must be located in a Central Office (CO) and one must be located at a customer's designated premises.

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B. Terms and Conditions (Cont'd)

2. Partial Ring

A DWR partial ring connects multiple customer designated locations (nodes) between fiber-meet locations at which high-speed interconnection of the Company's backbone network facilities to the customer's facilities or the facilities of a third party occurs.

Partial ring service may only be interconnected to (1) another partial ring provided by the Company, or (2) ring facilities provided by the customer or a third party.

The portion of the ring provided by the customer or third party must use vendor equipment that matches the equipment used by the Company and must maintain the same vintage in software release as that in use by the Company. Upon written notice by the Company, the customer or third party will have sixty (60) days in which to complete the change to any software release deployed by the Company.

A fiber-meet may occur at a customer's designated premises, in a Company CO, or at a location that is mutually agreeable to both the customer and the Company.

When the fiber-meet occurs at a customer's designated premises, the point of interconnection between the Company's facilities and the facilities of the customer or of a third party shall be a node.

When the fiber-meet occurs in a Company CO, high-speed interconnection from the device (node or amplifier) occurs at a collocation arrangement via fiber cross-connects between the Company's fiber optic facilities and the customer's or third party's facilities.

When the fiber-meet occurs at a mutually agreed upon location, the point of interconnection shall be a high-speed (pass-through) interface.

A partial ring must have a minimum of two devices (nodes or amplifiers), one of which must be a node. Additionally, at least one of the devices (node or amplifier) must be located in a Company CO. When the fiber-meet occurs via a high-speed (pass-through) interface at a mutually agreed upon location, that interface is provided in lieu of the device (node or amplifier) at that location.

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B. Terms and Conditions (Cont'd)

2. Partial Ring (Cont'd)

A DWR partial ring connects multiple customer designated locations (nodes) between fiber-meet locations at which high-speed interconnection of the Company's backbone network facilities to the customer's facilities or the facilities of a third party occurs.

When DWR is provided in a partial ring configuration, the following applies:

- a. The customer must provide the Company with its fiber optic facility requirements (i.e., whether it will use single mode fiber or multi-mode fiber) prior to the Company ordering the necessary devices (nodes and amplifiers) to provide the requested service. The customer may utilize its own fiber optic facilities or the facilities of a third party.
- b. The customer must provide, at no cost to the Company, suitable and secure space, suitable environmental conditions, an uninterrupted power supply, building entrance facilities, and conduit for placement of the facilities and network equipment at its locations as necessary to provide the service.
- c. Interconnection to partial DWR services may occur (i) at the customer's designated premises for which interconnection will occur via a node, (ii) in a Company CO for which a node or amplification device and fiber cross-connects to a collocation arrangement within that CO will apply, or (iii) at a mutually agreed upon location via a high-speed (pass-through) interface as described in the following section.
- d. Interconnection to partial DWR service is limited to high-speed fiber interconnection of the Company's backbone network fiber optic facilities and the fiber optic facilities of the customer or of a third party. Except as specified in the Product Guide, interconnection to other Company services may not occur at a premises which the customer has designated at its fiber-meet location.
- e. When ordering a transport channel that originates at and terminates to devices that are not within the partial ring provided by the Company, the customer must provide the Company with a copy of the order. This order provides the Company with authority to perform the necessary mapping of the channel through the partial ring to ensure continuity of the signal over the jointly provided ring. A Channel Mapping nonrecurring charge will apply for each channel mapped through a Company provided partial ring. Channel Mapping charges do not apply when ordering point-to-point or point-to-meet-point optical transport channels. Channel Mapping is further described in the Product Guide.

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B. Terms and Conditions (Cont'd)

3. Network Design

The Company is responsible for the overall design and configuration of the DWR. Construction of the ring will not begin until such design and configuration are mutually agreeable to both the customer and the Company.

The customer or third party is responsible for engineering its portion of the jointly provided ring. The Company may engineer the customer's portion or the third party's portion of the ring within the LATA subject to addition engineering.

The Company's network design will define the optical parameters at the fiber-meet locations. The Company is responsible for the quality and integrity of the high-speed optical signal at the fiber-meet where its facilities are interconnected to the facilities of the customer or of the third party.

The Company bears no responsibility for the optical parameters beyond the fiber-meet (i.e., in the facilities of the customer or of the third party).

The customer is responsible to ensure that its facilities and equipment meet any applicable technical requirements or limitations for the protocol being transmitted over the optical transport channels.

The technical specifications for DWR are delineated in Technical Publications GR-2918- CORE, Issue 4, GR-2979-CORE, Issue 3, GR-1312-CORE, Issue 3, ITU G.959.1, and ITU G.692.

4. Connection to a Dedicated Wavelength Ring (DWR)

Connection of SONET Connects to a DWR occurs via a protected or unprotected SONET transport channel of an equal speed as follows:

SONET Connects	Single Port	Multi-port	Multi-port
<u>Capacity</u>	<u>Channel</u>	<u>2.5 Gbps</u>	<u>10 Gbps</u>
		<u>Facility</u>	<u>Facility</u>
OC3/OC3c	SONET OC3/OC3c	SONET OC3/OC3c	
OC12/OC12c	SONET OC12/OC12c	SONET OC12/OC12c	
OC48/OC48c	SONET OC48/OC48c		SONET OC48/OC48c
OC192/OC192c	SONET OC192/OC192c		

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B. Terms and Conditions (Cont'd)

4. Connection to a Dedicated Wavelength Ring (DWR) (Cont'd)

Connection of Enhanced Dedicated SONET Ring (EDSS) to a DWR is provided over an equal speed, unprotected optical transport channel (e.g. a 155.52 Mbps unprotected channel would connect to an OC3 EDSS DSR node). Each node on the EDSS ring must be located at the same customer designated premises or in the same Company CO as its corresponding DWR node.

Connection of SONET Point-to-Point (SPTP) to a DWR is provided over an equal speed OC3/OC3c, OC12/OC12c, OC48/OC48c, or OC192/OC192c protected SONET optical transport channel with a 2-fiber or 4-fiber interface, or using an equal speed unprotected optical transport channel with a 2-fiber interface as described in the following section. Protected 4-fiber interfaces are available with single port interfaces only.

Connection of a Verizon Optical Networking to a DWR is provided over an equal speed protected optical transport channel as follows. These services are transported over the DWR using a 2-fiber protected interface or a 4-fiber protected interface.

Verizon Optical Networking Service	Multi-port Single Port Channel	Multi-port 2.5 Gbps Facility	10 Gbps Facility
OC3c Ethernet to SONET mapped Service	SONET OC3c	SONET OC3c	
GigE12/600 Mbps Ethernet mapped to OC12c Ethernet to SONET mapped	SONET OC12c	SONET OC12c	
1 Gbps Ethernet full rate	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
1 Gbps FICON	1 Gbps FICON	1 Gbps FICON	1 Gbps FICON
Fibre Channel	1 Gbps Fibre	1 Gbps Fibre	1 Gbps Fibre

Connection of a Verizon Optical Networking Gigabit Fibre Channel and/or Gigabit FICON service is provided over a Gigabit Fibre channel and/or Gigabit FICON optical transport channel.

The use of a multi-port interface card requires that all channels on a single card be interrupted during periods when the Company is performing maintenance on that card. No credit for such periods of interruption will apply.

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C. Service Components

1. Nodes

Nodes are Dense Wave Division Multiplexing (DWDM) devices located at customer designated premises or Company wire centers from which optical transport channels are multiplexed on or off of the DWR. The type of node that is deployed at each location is determined by the number of optical transport channels that will be multiplexed on or off of the DWR at that location.

a. 4 Channel Node

Placement of a 4 channel node at a location enables up to 4 protected optical transport channels to be deployed. Each protected optical channel may be replaced by two unprotected optical channels up to a maximum of 8 possible channels on the node. A 4 channel node may be utilized as the primary node at a location or as an expansion node to expand the capacity of a 16 channel primary node. 4 channel nodes are subject to the availability of suitable facilities and equipment to provide such device. No more than one 4 channel node will be provided at a location.

b. 16 Channel Node

Placement of a 16 channel node at a location enables up to 16 protected optical transport channels to be deployed. Each protected optical channel may be replaced by two unprotected optical channels up to a maximum of 32 possible channels on the primary node.

The capacity of a 16 channel primary node may be increased through the addition of an expansion node at the same location. A 4 channel expansion node enables up to 20 protected optical transport channels (i.e., 16 on the primary node and 4 on the expansion node) to be deployed at a single location. Each protected optical channel may be replaced by 2 unprotected optical channels up to a maximum of 40 possible channels at that location. A 16 channel expansion node enables up to 32 protected optical transport channels (i.e., 16 on the primary node and 16 on the expansion node) to be deployed at a single location. Each protected optical channel may be replaced by two unprotected optical channels up to a maximum of 64 possible channels at that location.

The maximum number of optical transport channels that can be deployed at a single location is dependent upon the specific configuration of the DWR and the type of optical transport channels being deployed from that location.

The customer will be billed additional charges for any charges levied by the Company for space and power required to place nodes on the Company's side of the network interface.

When two nodes are located in the same building there will be no diversity between the two nodes.

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C. Service Components (Cont'd)

2. Mileage

For full ring service configurations, DWR Mileage is the total of airline distances between devices (nodes and amplifiers) rounded up to the nearest mile. The mileage rate is based on total ring capacity and not on individual services between devices. For example, the mileage charge for a five device ring with two mid-span amplifiers and a distance of 4.3 miles between each device (21.5 total miles) would be calculated by multiplying the mileage rate by 22 miles.

For partial ring service configurations, DWR Mileage is the total of linear airline distances between fiber-meet locations (customer designated premises, CO or mutually agreed upon location, as applicable) and each device (node or amplifier) on the partial ring. The total mileage is then rounded up to the nearest mile. The mileage between devices (e.g., an initial node and an expansion node or an At-Node amplifier, as applicable) located at the same customer designated premises or Company CO is zero. This mileage calculation applies regardless of the number of services on the ring.

3. Network Optimization/Amplification

Network Optimization provides for amplification of the signal to ensure acceptable optical levels. When required, amplification is performed in a Company CO when mid-span amplification of the signal is required between nodes. Node amplification occurs in one or two directions (East to West and/or West to East). Mid-span amplification occurs simultaneously in both directions (East to West and West to East). The Company shall have sole responsibility in determining when amplification is required and the quantity and type of amplification necessary to maintain acceptable optical levels.

4. High-Speed (Pass-Through) Interface

A high-speed (pass-through) interface is a device placed at a mutually agreed upon fiber meet location where interconnection between the facilities of the Company and those of the customer or of a third party provider occurs. The high-speed (pass through) interface will not be utilized when such interconnection occurs within a Company CO (for which a node or amplification device and fiber cross-connects apply) or at a customer's designated premises for which interconnection via a node occurs. Connection to other Company services is prohibited at locations utilizing a high-speed (pass-through) interface.

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C. Service Components (Cont'd)

5. Optical Transport Channels

Optical transport channels allow for optical services to be multiplexed on to or off of the DWR at locations equipped with a DWR node. An optical interface at the node allows for connection of the applicable protocol to the customer's equipment. Optical transport channels are provided on a node-to-node (i.e., point-to-point) basis, or between a location equipped with a DWR node and a fiber-meet location. These channels are provided on a point-to-fiber-meet basis. When a channel that originates at and terminates to devices which are not within the partial ring, the Company must map that channel through the partial ring to ensure continuity of the signal over the jointly provided ring.

A Channel Mapping nonrecurring charge applies in lieu of the rates and charges for a point-to-point or point-to-fiber-meet transport channel. Optical Transport Channels are available on a protected or unprotected basis depending on the protocol being transmitted and the level of redundancy required for the optical channel. These channels may be ordered using a single-port interface (each a single channel per interface card) or using a multi-port interface. A multi-port interface is a facility capable of supporting up to 4 multi-port channels of ESCON, Fibre Channel, FDDI, Fast Ethernet, D1 Video, or any combination of these multi-port channels. A multi-port optical transport channel provides a two-point facility over the DWR for the purpose of aggregating multiple optical channels over a single wavelength.

Some protocols have facility distance limitations and may affect the design or availability of the DWR or its optical transport channels. The multi-port interface is provided with a short reach, 2-fiber interface with a 1310nm signal. A protected optical channel allows for a single signal from the customer to be duplicated and sent over separate diverse routes (working and protect) within the DWR network. An unprotected optical channel provides minimum protection of the signal from the customer. End-to-end protection is provided by the protection inherent in the connecting service provided by Verizon (e.g., EDSS), as applicable.

Optical transport channels are delivered over a single-port interface or multi-port optical transport channel unless otherwise specified. The use of a multi-port optical transport channel and the type of optical transport channels that can be provided over a single-port or multi-port optical transport channel are subject to the availability of suitable equipment to provide the requested service. Multi-port facilities are offered in capacities of 2.5 Gbps or 10 Gbps and are capable of supporting the following channel types, in any combination up to the maximum capacity of the multi-port facility.

2.5 Gbps Multi-port Facility

ESCON
1 Gbps Fibre Channel
FDDI
1 Gbps FICON
Fast Ethernet
D1 Video
SONET OC3/OC3c
SONET OC12/OC12c
Gigabit Ethernet

10 Gbps Multi-port Facility

1 Gbps Fibre Channel
2 Gbps Fibre Channel
Gigabit Ethernet
1 Gbps FICON
2 Gbps FICON
SONET OC48/OC48c

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C. Service Components (Cont'd)

6. Protocols

All signals generated by customer provided equipment and delivered to the Company for multiplexing on to DWR must meet industry standards and specifications for the underlying protocol. The customer is responsible to perform any error detection and error correction of the data generated by its equipment. The Company assumes no responsibility for the quality of the signal generated by the customer or any customer provided equipment and will deliver the signal to the receiving location in the same format and condition as generated by the customer. The Company will transmit the following protocols over DWR optical transport channels:

SONET OC3 - for transmission of 155.52 Mbps synchronous optical data transmission capability. SONET OC3 is delivered over a 2-fiber or 4-fiber single-port channel or a 2.5 Gbps multi-port channel.

SONET OC3c - for transmission of concatenated 155.52 Mbps synchronous optical data transmission capability. SONET OC3c is delivered over a 2-fiber or 4-fiber single-port channel or a 2.5 Gbps multi-port channel.

SONET OC12 - for transmission of 622.08 Mbps synchronous optical data transmission capability. SONET OC12 is delivered over a 2-fiber or 4-fiber single-port channel or a 2.5 Gbps multi-port channel.

SONET OC12c - for transmission of concatenated 622.08 Mbps synchronous optical data transmission capability. SONET OC12c is delivered over a 2-fiber or 4-fiber single-port channel or a 2.5 Gbps multi-port channel.

SONET OC48 - for transmission of 2.488 Gbps synchronous optical data transmission capability. SONET OC48 is delivered over a 2-fiber or 4-fiber single-port channel or a 10 Gbps multi-port channel.

SONET OC48c - for transmission of concatenated 2.488 Gbps synchronous optical data transmission capability. SONET OC48c is delivered over a 2-fiber or 4-fiber single-port channel or a 10 Gbps multi-port channel.

SONET OC192 - for transmission of 9.953 Gbps synchronous optical data transmission capability. SONET OC192 is delivered over a 2-fiber or 4-fiber single-port channel only.

SONET OC192c - for transmission of concatenated 9.953 Gbps synchronous optical data transmission capability. SONET OC192c is delivered over a 2-fiber or 4-fiber single-port channel only.

ESCON* - for transmission of one 200 Mbps Enterprise Service Connection channel between the same two DWR nodes used for computer-to-computer data exchange. An ESCON signal is limited to a maximum distance of 43km (physical route kilometers) between the locations involved. ESCON is delivered over a 2.5 Gbps multi-port channel only.

FICON* - for transmission of 1 Gbps and 2 Gbps Fiber Connection among mainframes, storage devices and peripherals on a single channel. A FICON signal is limited to a maximum distance of 100km (physical route kilometers) between the locations involved. FICON is delivered over a single-port channel, a 2.5 Gbps multi-port channel or a 10 Gbps multi-port channel.

* Denotes a data optical transport channel

Dedicated Wavelength Ring (DWR)

C. Service Components (Cont'd)

6. Protocols (Cont'd)

Fibre Channel* - for transmission of 2.125 Gbps, 1.0625 Gbps, 531 Mbps, 266 Mbps and 133 Mbps in a serial link between supercomputers, mainframes, workstations, desktop computers, storage devices, displays and other peripherals. A Fibre Channel signal is limited to a maximum distance of 100km (physical route kilometers) between the locations involved. Fibre Channel signals at transmission speeds of 2.125 Gbps, 1.0625 Gbps, 531 Mbps, 266 Mbps, and 133 Mbps are delivered over a single-port channel. Fibre Channel may also be delivered over a multi-port channel as follows:

<u>2.5 Gbps Multi-port Facility</u>	<u>10 Gbps Multi-port Facility</u>
133 Mbps	1.0625 Gbps
266 Mbps	2.125 Gbps
531 Mbps	
1.0625 Gbps	

ETR/CLO* - a channel for transmission of an 8 Mbps External Timing Reference/Control Link Oscillator signal for distributing time-of-day information to all central processing units in the Sysplex and to keep the Sysplex timer units synchronized with each other. An ETR/CLO signal is limited to a maximum distance of 40km (physical route kilometers) between the locations involved. ETR/CLO is delivered over a single-port channel only.

FDDI* - for transmission of 100 Mbps Fiber Distributed Data Interface channels for general purpose interconnection between computers and peripheral equipment, including interconnection of Local Area Networks and other networks. FDDI is delivered over a single-port channel or 2.5 Gbps multi-port channel.

ISC* - for transmission of 1.06 Gbps InterSystem Channel for data caching, locking and queuing services between coupling facility and a central processing unit. An ISC signal is limited to a maximum distance of 40km (physical route kilometers) between the locations involved. ISC is delivered over a single-port channel only.

ISC3* - for transmission of 2.125 Gbps InterSystem Channel for data caching, locking and queuing services between coupling facility and a central processing unit. An ISC3 signal is limited to a maximum distance of 40 km (physical route kilometers) between the locations involved. ISC3 is delivered over a single-port channel only.

* Denotes a data optical transport channel.

Dedicated Wavelength Ring (DWR)

C. Service Components (Cont'd)

6. Protocols (Cont'd)

Fast Ethernet* - for 100 Mbps transmission of Ethernet. Fast Ethernet is delivered over a single-port or multi-port channel.

Gigabit Ethernet* - for 1.0 Gbps transmission of Ethernet. Gigabit Ethernet is delivered over a single-port channel, a 2.5 Gbps multi-port channel, or a 10 Gbps multi-port channel.

10 Gigabit Ethernet LAN-PHY - 10GBASE-R (LAN PHY) interfaces offer an effective line rate of 10.3125 Gbps (10 Gbps of data traffic encoded in a 64B/66B protocol compared to the traditional 8B/10B protocol of Gigabit Ethernet). 10 Gigabit Ethernet LAN-PHY is delivered over a single-port channel only.

10 Gigabit Ethernet WAN-PHY - 10GigE data rate and format compatible with the SONET OC192c transmission format defined by ANSI. 10 Gigabit Ethernet WAN-PHY is delivered over a single-port channel only.

D1 Video* - for uncompressed digital transmission of video signals operating at 270 Mbps. D1 Video is delivered over a single-port channel or 2.5 Gbps multi-port channel.

7. Channel Interface Codes

The following channel interface codes are used for the DWR:

NCI

02FMF.4 for 4 Channel Node (Primary or Expansion)

02FMF.16 for 16 Channel Node (Primary or Expansion)

The following channel interface codes are used for channels using wavelengths on the DWR:

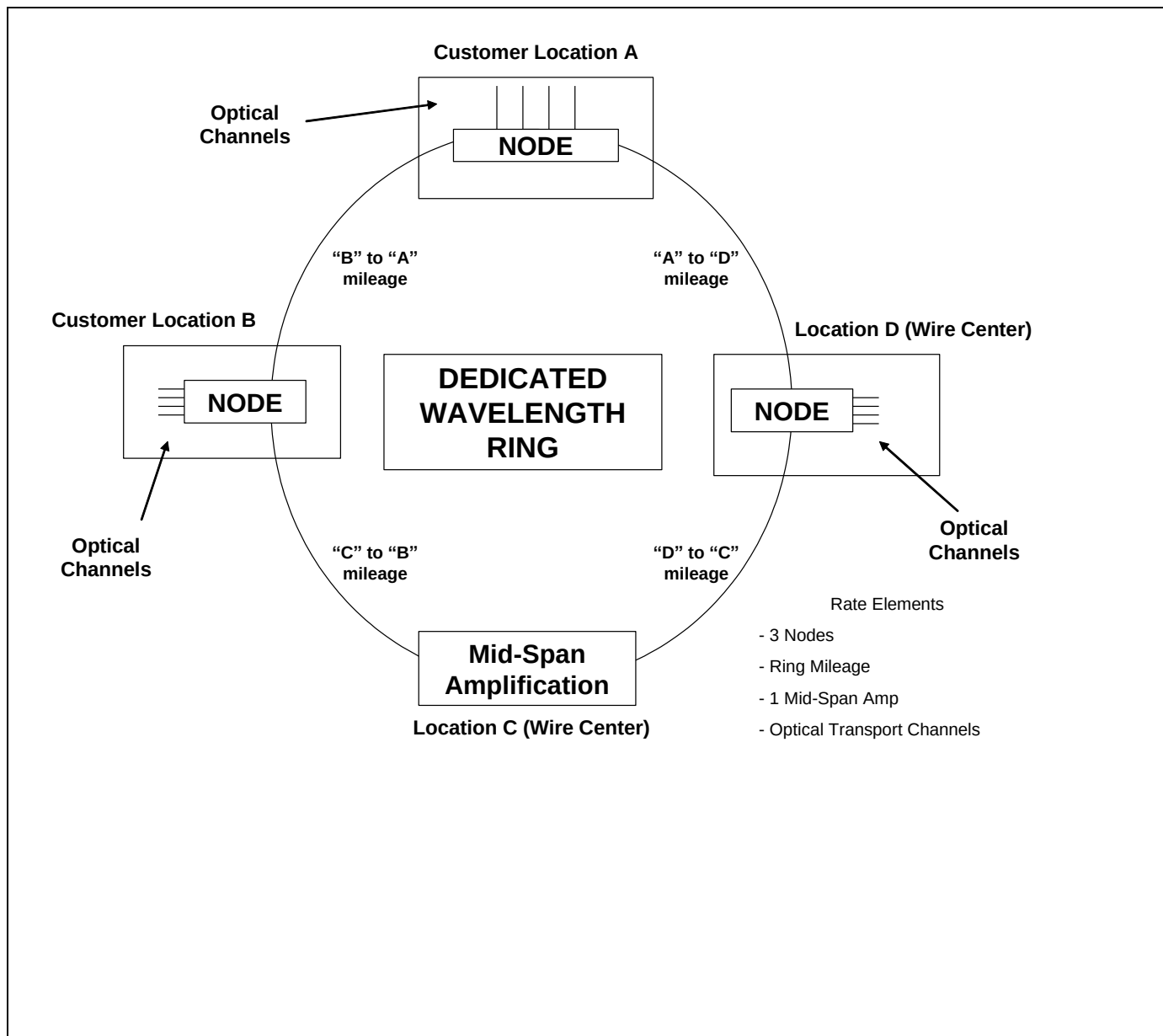
02FCF.10A (FDDI MM 125 Mbps)	02OPF.A02, A04, A07 (266 Mbps Fibre Channel)
02FCF.10A (FDDI SM 125 Mbps)	02OPF.A02, A04, A07 (531 Mbps Fibre Channel)
02FMF.S (DWDM 4-Port 1.25 Gbps)	02OPF.A02, A04, A07 (ESCON)
02LNF. A02, A04, A07 (Fast Ethernet)	02OPF.A02, A04, A07 (ETR/CLO)
02LNF. A02, A04, A07 (Gigabit Ethernet)	02OPF.A02, A04, A07 (ISC)
02LNF.A02 (10 Gigabit Ethernet LAN-PHY)	02SOF.B,D,F,X (SONET OC12/OC12c)
02LNF.A02 (10 Gigabit Ethernet WAN-PHY)	02SOF.B,D,F,X (SONET OC192/192c)
02OPF.A02, A04, A07 (2.125 Gbps Fibre Channel)	02SOF.B,D,F,X (SONET OC3/OC3c)
02OPF.A02, A04, A07 (2.125 Gbps FICON)	02SOF.B,D,F,X (SONET OC48/OC48c)
02OPF.A02, A04, A07 (ISC3 at 2.125Gbps)	02TD6.E (D1 Video)
02OPF.A02, A04, A07 (1.0625 Gbps Fibre Channel)	04SOF.B,D,F,X (SONET OC12/OC12c)
02OPF.A02, A04, A07 (133 Mbps Fibre Channel)	04SOF.B,D,F,X (SONET OC3/OC3c)
02OPF.A02, A04, A07 (1Gbps FICON)	04SOF.B,D,F,X (SONET OC48/OC48c)

* Denotes a data optical transport channel.

Dedicated Wavelength Ring (DWR)

C. Service Components (Cont'd)

8. An example of a Dedicated Wavelength Ring is diagrammed below:



Dedicated Wavelength Ring (DWR)

D. Optional Features

The customer has the option of purchasing one of the following Network Management Methods for use with DWR Special Access service provided by the Company in accordance with the Product Guide. Only one method may be provided on a single DWR. Network Management Methods will be available subject to compatibility of the current release of the Network Management Methods software with the DWR equipment deployed for the customer's network.

1. Customer Service Management (CSM)

CSM provides a customer with real-time information about the operational status of its DWR network. CSM provides a network view of real-time detection and reporting of network alarm conditions within the customer's DWR network. In addition, CSM provides the customer with the ability to generate basic network performance reports for its DWR network. The customer may also request network performance reports that are customized to meet their specific needs.

a. Terms and Conditions

The customer must utilize Internet web access to connect its customer-provided terminal equipment to the Company's CSM management system. Access to the internet and any associated rates and charges are the responsibility of the customer. The customer is also responsible for obtaining communications software that is compatible with the software the Company utilizes to provide CSM. The Company will work cooperatively with the customer to determine compatibility of its communications software.

CSM is provided only when the Company provides all nodes on the ring.

Subject to the restrictions set forth in D.1.c following, CSM is provided coincident with the installation of the associated DWR ring or may be added to an existing ring.

b. Application of Rates and Charges

A CSM monthly recurring charge applies, per full or partial ring, for each DWR provided with the CSM optional feature.

A Node Setup charge applies, per primary or expansion node, for each node that is equipped with CSM at the time that CSM is initially established on the DWR.

An Initial CSM Setup charge applies for establishment of the customer's initial CSM database partition. The initial CSM database partition includes setup for up to six (6) users.

A Setup of Additional Users charge applies for the setup of up to six (6) additional users beyond those users included with the setup of initial or additional database partitions.

A Setup of Additional Partition charge applies for the setup of an additional CSM database partition created for the same customer. Each additional CSM database partition provides for the setup of up to six (6) additional users.

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D. Optional Features (Cont'd)

1.. Customer Service Management (CSM) (Cont'd)

b. Application of Rates and Charges (Cont'd)

An Add/Remove Node charge applies, per primary and expansion node, for each node that is added to, or removed from, a DWR equipped with CSM subsequent to the initial establishment of CSM.

A Consultation and Support charge applies for each thirty (30) minutes or fraction thereof that the customer requests Company consultation and support of its CSM network. This charge does not apply during initial setup of CSM.

A Change in Network Management Method charge applies, per primary and expansion node, when the customer requests a change in Network Management Method (e.g., from CSM to DTM).

c. Rate Terms and Conditions

CSM is provided under a term plan of 3 years, 5 years or 7 years, as described following:

1. The duration of the term plan for CSM must be the same duration as the term plan for the DWR nodes provided with CSM. At the expiration of its 3-, 5- or 7-year term plans for CSM, the customer has the option of extending CSM with a coterminous end date as described following.
2. The expiration date of each CSM added subsequent to the initial installation must be coterminous to the expiration date of the associated DWR, provided the addition is prior to the 21st month for a 3-year plan, prior to the 36th month for a 5-year plan, or prior to the 50th month for a 7-year plan. A CSM added after the aforementioned periods requires extension of the commitment period for the associated DWR in accordance with the Product Guide. Such extension results in the establishment of a new plan that includes both the DWR and the CSM under the same plan with the same expiration date.

The customer may retrieve basic reports containing performance-monitoring information on its DWR network. Basic reports are available at no additional charge to the customer. The customer may also request that a report be customized to meet its particular needs. Rates and charges for customized reports are provided on an individual case basis (ICB) only.

CSM is subject to termination liability if the service is disconnected prior to completion of the existing commitment period. The terms and conditions in F.3 apply to termination of CSM prior to completion of the existing commitment period. Changes in Network Management Method (e.g., from CSM to DTM) will be made without termination liability subject to the Add/Remove Node charge described in D.1.b this Product Guide.

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D. Optional Features (Cont'd)

2. Direct TL1 Monitoring (DTM)

DTM provides a customer with near real-time information about the operational status of its DWR network over a TL1 connection. A TL1 connection is a machine-to-machine communication language protocol. The connection allows a customer to monitor its DWR network via a limited set of executable TL1 commands in order to query alarm and performance criteria.

DTM enables the following:

- Near real-time access to system-generated alarm and performance messages originating from the customer's DWR network elements.
- Query and response capability that enables two-way communications with the capability to poll and retrieve messages, such as command alarms and performance messages.
- Access to ring inventory information that will enable the customer to maintain its own inventory database containing network element configurations and usage records for active service channels.
- Notification that a power failure has occurred at a DWR network element and that the affected network element has reverted to battery backup.
- Ability to monitor the ring, as well as all service channels riding the ring.

a. Terms and Conditions

The customer must order two (2) special access services, provided by the Company, in order to ensure secure, dedicated private line access and enable full redundancy for DTM. These special access lines must originate at the customer's designated premises and terminate at a DTM site designated by the Company with the terms and conditions of this Product Guide. The customer is responsible for procuring any additional services that may be necessary to connect the special access service to the customer's designated premises.

When requested by the customer, and where technically feasible to do so, the Company will provide encryption capabilities on the Special Access Services used to access DTM. The Company will specify any equipment or software required to provide encryption. Obtaining such equipment or software is the responsibility of the customer. The customer is also responsible for:

1. Security of any equipment, servers, systems or other facilities provided by the customer and which have access to the DTM network; and
2. Monitoring access to the DTM service using the facilities, systems, equipment or servers provided by the customers.
3. DTM is only provided when the Company provides all the nodes on the ring.

Dedicated Wavelength Ring (DWR)

D. Optional Features (Cont'd)

2. Direct TL1 Monitoring (DTM) (Cont'd)

b. Application of Rates and Charges

A DTM monthly recurring charge applies, per full ring, for each DWR provided with the DTM optional feature.

A Node Setup charge applies, per primary or expansion node, for each node that is equipped with DTM at the time that DTM is initially established on the DWR.

A DTM Setup charge applies for establishment of the customer's DTM database partition.

An Add/Remove Node charge applies, per primary and expansion node, for each node that is added to, or removed from, an DWR ring equipped with DTM subsequent to the initial establishment of DTM.

A Consultation and Support charge applies for each thirty (30) minutes or fraction thereof that the customer requests Company consultation and support of its DTM network. This charge does not apply during initial setup of DTM.

A Change in Network Management Method charge applies, per primary and expansion node, when the customer requests a change in Network Management Method (e.g., from DTM to CSM).

c. Rate Terms and Conditions

DTM is provided under a term plan of 3 years, 5 years or 7 years, as described following.

1. The duration of the term plan for DTM must be the same duration as the term plan for the DWR nodes provided with DTM. At the expiration of its 3-, 5- or 7-year term plans for DTM, the customer has the option of extending DTM with a coterminous end date as described following.
2. The expiration date of each DTM added subsequent to the initial installation must be coterminous to the expiration date of the associated DWR, provided the addition is prior to the 21st month for a 3-year plan, prior to the 36th month for a 5-year plan, or prior to the 50th month for a 7-year plan. A DTM added after the aforementioned periods requires extension of the commitment period for the associated DWR in accordance with the Product Guide.

Dedicated Wavelength Ring (DWR)

D. Optional Features (Cont'd)

2. Direct TL1 Monitoring (DTM) (Cont'd)

C. Rate Terms and Conditions (Cont'd)

Such extension results in the establishment of a new plan that includes both the DWR and the DTM under the same plan with the same expiration date.

Termination liability will apply if DTM is removed prior to completion of the existing commitment period. The terms and conditions in E.3 apply to termination of DTM prior to completion of the existing commitment period. Changes in Network Management Method (e.g., from DTM to CSM) will be made without termination liability subject to the Add/Remove Node charge set forth in D.2.b. of this Product Guide.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges

1. Commitment Periods

DWR is available for 3-, 5- and 7-year commitment periods for the nodes, ring mileage, network optimization mid-span amplification and optical transport channels. DWR Optical Transport Channels are also available for a 1-year commitment.

Nodes, network optimization mid-span amplification and SONET optical transport channels added subsequent to the initial installation may be coterminous to the expiration date of the DWR at the rates and charges specified for the term plan on the existing DWR or may require an extension to the existing plan as follows:

For all rate elements other than SONET optical transport channels under a 1-year commitment period:

If the addition is prior to the 21st month for an existing 3-year plan, prior to the 36th month for an existing 5-year plan, or prior to the 50th month for an existing 7-year plan, the addition will be coterminous to the expiration date of the DWR.

If the addition is after the aforementioned periods, the customer must extend the commitment period of the existing plan for an additional one year for a 3-year plan, an additional 2 years for a 5-year plan, or an additional 3 years for a 7-year plan. SONET services associated with DWR are subject to the termination liability set forth in E.3 following.

For SONET optical transport channels under a 1-year commitment period, the addition will have commitment period that expires one year from the date that billing for the SONET optical transport channel commences. The minimum service period for such channels is three months.

Data optical transport channels added subsequent to the initial installation under a 3-year, 5-year or 7-year commitment period will be coterminous to the expiration date of the DWR at the rates and charges specified for the term plan on the existing DWR. These channels are subject to a minimum service period of three months.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

1. Commitment Periods (Cont'd)

Data optical transport channels under a 1-year commitment period will have a commitment period that expires one year from the date that billing for the SONET optical transport channel commences. The minimum service period for such channels is three months.

The addition of SONET and/or Data optical transport channels subsequent to the initial installation of service may also require the addition of an expansion node(s) and/or network optimization device(s) to accommodate the increase in channels. The addition of an expansion node or network optimization is subject to the conditions set forth above.

Monthly recurring charges apply for the nodes, ring mileage, network optimization, partial ring high speed (pass-through) interfaces (certain partial ring configurations only), and optical transport channels. The monthly rate for an optical transport channel applies for the entire point-to-point connection. The monthly rate for a point-to-fiber-meet optical transport channel applies for the entire node-to-fiber-meet (collocation arrangement in a wire center, premises or mutually agreed upon location, as applicable) connection. Once a term period expires, the prevailing rates of the current plan will continue until the customer cancels service or requests a new term plan.

When the optical transport channel is provided with a multi-port channel, rates and charges apply for the multi-port facility and for each multi-port channel riding the multi-port facility. When an optical transport channel is delivered over a multi-port channel, the multi-port facility and each multi-port channel riding the multi-port facility must be billed to the same customer who subscribes to the DWR. Once a term period expires, the prevailing rates of the current plan will continue until the customer cancels service or requests a new term plan.

The rates and charges for optical transport channels delivered over a single-port or multi-port interface are set forth in F.4 When the optical transport channel is provided with a multi-port interface, rates and charges apply for the multi-port facility and for each multi-port channel riding the multi-port facility.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

2. Nonrecurring Charges

Nonrecurring charges for DWR apply for the initial installation of service and for any subsequent node, network optimization mid-span amplification, or optical transport channel that is added at any time after the initial installation of service. A nonrecurring charge also applies to upgrade a 4 channel primary node to a 16 channel primary node or a 4 channel expansion node to a 16 channel expansion node.

Additionally, a Channel Mapping nonrecurring charge as set forth in G.6 e applies for each channel which the Company must map over the partial ring. Only channels that originate at and terminate to devices that are not within the partial ring require mapping.

A change in the type (e.g., Fibre Channel to FICON, or SONET channel with a 2-fiber interface to SONET channel with a 4-fiber interface) or optical carrier rate (e.g., OC3 to OC12) of optical transport channel is treated as a discontinuance of the existing channel and an installation of a new optical transport channel.

When an optical transport channel is ordered to connect with EDSS or SPTP, the optical channel will be billed to the EDSS or SPTP customer, as applicable.

When an optical transport channel is delivered over a multi-port interface, the multi-port facility and each multi-port channel riding the multi-port facility must be billed to the same customer who subscribes to the DWR.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

3. Termination Liability

Termination liability applies to DWR and is charged per rate element on all nodes, network optimization, partial ring high speed (pass-through) interfaces, optical transport channels and Network Management Methods. Data optical transport channels as set forth in this Product Guide are not subject to termination liability, however, such channels are subject to a minimum service period of three months.

A separate termination liability charge is assessed for each rate element associated with the disconnected DWR or a Network Management Method. For example, assume that the customer subscribes to a DWR ring that is arranged with the Direct TL1 Monitoring Optional Feature, as set forth in D.2 preceding. Further, assume that the customer disconnects the DWR ring along with the Direct TL1 Monitoring Optional Feature prior to the end of the commitment period. Then, the customer shall pay termination liability on the nodes, network optimization, partial ring high-speed interfaces, optical transport channels and the Direct TL1 Monitoring Optional Feature monthly recurring rate elements as set forth in G Rates and Charges.

DWR or a Network Management Method may be canceled without termination liability when cancellation of the DWR or Network Management Method occurs within thirty (30) days of the effective date of a Company initiated rate increase of eight percent (8%) or more on any rate applicable to DWR service or Network Management Method.

Termination liability will not apply (1) if a customer changes its term plan to a longer commitment period; (2) if a 4 channel primary node is upgraded to a 16 channel primary node; or (3) if a 4 channel expansion node is upgraded to a 16 channel expansion node.

Termination liability will apply when the conditions above are not met and the customer cancels service prior to expiration of the plan period.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

3. Termination Liability (Cont'd)

For all rate elements other than SONET optical transport channels under a 1-Year commitment period, if the cancellation occurs within the first two years of a term plan, termination liability is equal to 100 percent (100%) of the monthly charges for the unexpired portion of the first two years, and 25 percent (25%) of the monthly charges for the remainder of the plan.

If the customer cancels after the first two years of service, then termination liability is equal to 25 percent (25%) of the monthly charges for the remaining life of the term.

For SONET optical transport channels under a 1-year term commitment, if the cancellation occurs prior to completion of the 1-year commitment period, termination liability is equal to 100 percent of the monthly charges for the unexpired portion of the first year.

For Dedicated Wavelength Ring (DWR) Service with a commitment period which was extended, termination liability is calculated as the difference between the monthly rates for the highest Term Pricing Plan commitment period that could have been satisfied prior to disconnection of the service or cancellation of the plan and the monthly rates already paid for the expired commitment period and the extended commitment period for the period of time the service was in effect.

4. Conversions

Customers who wish to move or convert existing Special Access EDSS or High Capacity Special Access services to DWR may do so without conversion charges (termination liability and installation charges) as long as the total capacity of Special Access services or EDSS purchased by the customer does not decrease.

5. Extension of a Commitment Period

The customer has the option, within sixty (60) days prior to the expiration date for its commitment period, to extend its expiring Term Pricing Plan to a plan with a longer commitment period, for which time-in-service credit will be allowed for the expiring plan. The commitment period selected for the extended plan must be longer than the commitment period of the expiring plan as follows:

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

5. Extension of a Commitment Period (Cont'd)

- An expiring 1-Year Term may be extended to a 3-Year, 5-Year or 7-Year Term Plan.
- An expiring 3-Year Term may be extended to either a 5-Year or 7-Year Term Plan.
- An expiring 5-Year Term may be extended to a 7-Year Term Plan.

Time-in-service credit on the expiring plan will be granted and applied towards the new extended plan. For example, an expiring 3-Year term plan will allow for 3 years of time-in-service credit towards the extended plan.

The customer may also extend the commitment period in order to install additional nodes, network optimization devices or SONET optical channels as described in E.1 preceding.

The rate for the longer commitment period will apply effective with the first bill day following expiration of the commitment period for the existing plan and continue through the remainder of the commitment period associated with the extended plan. No adjustment for the increased discount associated with the extended plan will be made to the monthly rates already billed on the expiring plan.

6. Credit Allowance for Service Interruption

For Dedicated Wavelength Ring (DWR) nodes and network optimization, any single service outage of four hours or more due solely to a Company facility failure will result in a credit of 100% of the monthly rates for the applicable DWR node or network optimization devices affected. Only one such credit is allowed in a single month's billing period.

For DWR Optical Transport Channels, the following credits will be applied:

- For protected Optical Transport Channels, any Company facility failure which is not restored within 1 minute will result in a credit of 100% of the monthly rate for the applicable protected optical channels affected. Only one such credit is allowed in a single month's billing period:
- For unprotected Optical Transport Channels, no credit applies for a service outage on these channels for which no protection is provided by the Company.

Dedicated Wavelength Ring (DWR)

E. Application of Rates and Charges (Cont'd)

7. Moves and Changes

A move involves a change in the physical location of the Customer designated Premises which also involves a connection to a different rate demarcation point. The charges for the move are dependent on whether the move is to a new location within the same building or to a different building.

a. Moves Within the Same Building

When the move is to a new location within the same building (Inside Move), a non-recurring charge for the Inside Move will apply. There will be no change in the Minimum Period requirement, and termination liability does not apply.

b. Moves To a Different Building

Moves to a different building (Outside Move) will be treated as a discontinuance and start of Service and all associated nonrecurring charges will apply. New minimum period and/or Service Discount Plan requirements will be established for the new Services. The Customer will also remain responsible for satisfying all outstanding minimum period and/or termination liability charges for the discontinued Service.

8. Cancellation Charges

For DWR, the Company will construct the customer's dedicated ring. The customer must provide the Company with complete and accurate information to design and construct the customer's dedicated ring. Construction will not begin until the customer and the Company agree on the design of the ring. The order date for the ring is the date on which the customer provides the Company with a complete and accurate order for the service. In the event that the customer cancels its request, or part of its request, for construction of the ring, cancellation charges will apply as follows.

Cancellation Charges Which Apply After the Order Date

	31st to 60th day after ordering	61st day after ordering to completion of Ring
- per Primary Node	\$13,000.00	\$26,000.00
- per Expansion Node	26,000.00	52,000.00
- per Mid-span Amp.	5,600.00	10,600.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges

1. Nodes, Per node

	Monthly <u>Rate</u>	Initial Nonrecurring <u>Charge</u>
<u>3-Year Term/4 Channel Nodes</u>		
Primary or Expansion		
Customer Premises Node	\$ 6,530.00	\$1.00
Primary or Expansion		
Central Office Node	6,530.00	1.00
<u>3-Year Term/16 Channel Nodes</u>		
Primary Customer Premises Node	8,270.00	1.00
Primary Central Office Node	8,270.00	1.00
Expansion Customer Premises Node	8,270.00	1.00
Expansion Central Office Node	8,270.00	1.00
<u>5-Year Term/4 Channel Nodes</u>		
Primary or Expansion		
Customer Premises Node	4,900.00	1.00
Primary or Expansion		
Central Office Node	4,900.00	1.00
<u>5-Year Term/16 Channel Nodes</u>		
Primary Customer Premises Node	6,200.00	1.00
Primary Central Office Node	6,200.00	1.00
Expansion Customer Premises Node	6,200.00	1.00
Expansion Central Office Node	6,200.00	1.00
<u>7-Year Term/4 Channel Nodes</u>		
Primary or Expansion		
Customer Premises Node	4,850.00	1.00
Primary or Expansion		
Central Office Node	4,850.00	1.00
<u>7-Year Term/16 Channel Nodes</u>		
Primary Customer Premises Node	6,100.00	1.00
Primary Central Office Node	6,100.00	1.00
Expansion Customer Premises Node	6,100.00	1.00
Expansion Central Office Node	6,100.00	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

1. Nodes, Per node (Cont'd)

	<u>Nonrecurring Charge</u>
Subsequent Installation or Augmentation, per 4 channel or 16 channel Primary or Expansion node	\$ 1,600.00
Upgrade to 16 channel Primary or Expansion Node, Per 4 channel Primary or Expansion Node Upgraded	20,000.00

2. Ring Mileage, per mile

	<u>Monthly Rate</u>
3-Year Term	
Mile 1 - 20	\$310.00
Mile 21 and Over	310.00
5-Year Term	
Mile 1 - 20	230.00
Mile 21 and Over	230.00
7-Year Term	
Mile 1 - 20	225.00
Mile 21 and Over	225.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges

3. Network Optimization,

per amplification device

	Monthly <u>Rate</u>	Nonrecurring <u>Charge</u>
Mid-span 3-Year Term	\$5,130.00	\$1.00
Mid-span 5-Year Term	3,850.00	1.00
Mid-span 7-year Term	3,825.00	1.00
		Nonrecurring <u>Charge</u>
Subsequent Installation, per amplification device	--	\$1,600.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

4. Optical Transport Channels, Point-to-Point Unprotected,
Single/Multi-Port Interface

<u>Interface</u> <u>Type</u>	<u>Monthly Rate</u>			
	<u>1-Year</u> <u>Term</u>	<u>3-Year</u> <u>Term</u>	<u>5-Year</u> <u>Term</u>	<u>7-Year</u> <u>Term</u>
Unprotected SONET OC3/OC3c	\$1,905.00	\$1,270.00	\$ 950.00	\$ 850.00
Unprotected SONET OC12/OC12c	2,100.00	1,400.00	1,050.00	950.00
Unprotected SONET OC48/OC48c	2,805.00	1,870.00	1,400.00	1,300.00
Unprotected SONET OC192/OC192c	6,900.00	4,600.00	3,450.00	3,350.00
Unprotected 1 Gbps FICON	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 2 Gbps FICON	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected Fibre Channel	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 2Gbps Fibre Channel	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected ETR/CLO	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected FDDI	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 1.06 Gbps ISC	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 2Gbps ISC3	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected Fast Ethernet	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected Gigabit Ethernet	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 10Gigabit Ethernet				
LAN-PHY/WAN-PHY	6,900.00	4,600.00	3,450.00	3,350.00
Unprotected D1 Video	3,600.00	2,400.00	1,800.00	1,600.00
Unprotected 2.5Gbps Multi-Port Facility	4,995.00	3,330.00	2,500.00	2,200.00
Unprotected Multi-Port Channel				
ESCON	225.00	225.00	225.00	225.00
Fibre Channel (up to 1Gbps)	225.00	225.00	225.00	225.00
FDDI	225.00	225.00	225.00	225.00
Fast Ethernet	225.00	225.00	225.00	225.00
D1 Video	225.00	225.00	225.00	225.00
OC3/3c	225.00	225.00	225.00	225.00
OC12/12c	225.00	225.00	225.00	225.00
Gigabit Ethernet	225.00	225.00	225.00	225.00
1Gbps FICON	225.00	225.00	225.00	225.00
Unprotected 10Gbps Multi-Port Facility	8,625.00	5,750.00	4,312.50	4,187.50
Unprotected Multi-Port Channel				
Gigabit Ethernet	225.00	225.00	225.00	225.00
1Gbps Fibre Channel	225.00	225.00	225.00	225.00
2Gbps Fibre Channel	225.00	225.00	225.00	225.00
1Gbps FICON	225.00	225.00	225.00	225.00
2Gbps FICON	225.00	225.00	225.00	225.00
OC48/48c	225.00	225.00	225.00	225.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

4. Optical Transport Channels, Point-to-Point Protected,
Single/Multi-Port Interface(Cont'd)

<u>Interface Type</u>	<u>Monthly Rate</u>			
	<u>1-Year Term</u>	<u>3-Year Term</u>	<u>5-Year Term</u>	<u>7-Year Term</u>
4-Fiber Protected SONET OC3/OC3c	\$3,810.00	\$2,540.00	\$1,900.00	\$1,700.00
4-Fiber Protected SONET OC12/OC12c	4,200.00	2,800.00	2,100.00	1,900.00
4-Fiber Protected SONET OC48/OC48c	5,610.00	3,740.00	2,800.00	2,600.00
4-Fiber Protected SONET OC192/OC192c	13,800.00	9,200.00	6,900.00	6,700.00
Protected SONET OC3/OC3c	2,400.00	1,600.00	1,200.00	1,100.00
Protected SONET OC12/OC12c	2,595.00	1,730.00	1,300.00	1,200.00
Protected SONET OC48/OC48c	4,305.00	2,870.00	2,150.00	1,925.00
Protected SONET OC192/OC192c	11,205.00	7,470.00	5,600.00	4,750.00
Protected 1 Gbps FICON	4,395.00	2,930.00	2,200.00	1,950.00
Protected 2 Gbps FICON	4,395.00	2,930.00	2,200.00	1,950.00
Protected Fibre Channel	4,395.00	2,930.00	2,200.00	1,950.00
Protected 2Gbps Fibre Channel	4,395.00	2,930.00	2,200.00	1,950.00
Protected FDDI	4,395.00	2,930.00	2,200.00	1,950.00
Protected 1.06 Gbps ISC	4,395.00	2,930.00	2,200.00	1,950.00
Protected 2Gbps ISC3	4,395.00	2,930.00	2,200.00	1,950.00
Protected Fast Ethernet	4,395.00	2,930.00	2,200.00	1,950.00
Protected Gigabit Ethernet	4,395.00	2,930.00	2,200.00	1,950.00
Protected 10Gigabit Ethernet				
LAN-PHY/WAN-PHY	11,205.00	7,470.00	5,600.00	4,750.00
Protected D1 Video	4,395.00	2,930.00	2,200.00	1,950.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

4. Optical Transport Channels, Point-to-Point Protected,
Single/Multi-Port Interface(Cont'd)

<u>Interface</u> <u>Type</u>	<u>Monthly Rate</u>			
	<u>1-Year</u> <u>Term</u>	<u>3-Year</u> <u>Term</u>	<u>5-Year</u> <u>Term</u>	<u>7-Year</u> <u>Term</u>
Protected 2.5Gbps Multi-Port Facility	\$6,000.00	\$4,000.00	\$3,000.00	\$2,700.00
Protected Multi-Port Channel				
ESCON	225.00	225.00	225.00	225.00
Fibre Channel (up to 1Gbps)	225.00	225.00	225.00	225.00
FDDI	225.00	225.00	225.00	225.00
Fast Ethernet	225.00	225.00	225.00	225.00
D1 Video	225.00	225.00	225.00	225.00
OC3/3c	225.00	225.00	225.00	225.00
OC12/12c	225.00	225.00	225.00	225.00
Gigabit Ethernet	225.00	225.00	225.00	225.00
1Gbps FICON	225.00	225.00	225.00	225.00
Protected 10Gbps Multi-Port Facility	14,006.25	9,337.50	7,000.00	5,937.50
Protected Multi-Port Channel				
Gigabit Ethernet	225.00	225.00	225.00	225.00
1Gbps Fibre Channel	225.00	225.00	225.00	225.00
2Gbps Fibre Channel	225.00	225.00	225.00	225.00
1Gbps FICON	225.00	225.00	225.00	225.00
2Gbps FICON	225.00	225.00	225.00	225.00
OC48/48c	225.00	225.00	225.00	225.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

5. Partial Ring Optical Transport Channels, Point-to-Fiber-Meet Unprotected,
Single/Multi-Port Interface

<u>Interface Type</u>	<u>Monthly Rate</u>			
	<u>1-Year Term</u>	<u>3-Year Term</u>	<u>5-Year Term</u>	<u>7-Year Term</u>
High Speed Pass-Through Interface	n/a	\$5,130.00	\$3,850.00	\$3,825.00
Unprotected SONET OC3/OC3c	\$1,200.00	\$800.00	\$600.00	\$500.00
Unprotected SONET OC12/OC12c	1,395.00	930.00	700.00	600.00
Unprotected SONET OC48/OC48c	1,500.00	1,000.00	750.00	700.00
Unprotected SONET OC192/OC192c	4,200.00	2,800.00	2,100.00	2,000.00
Unprotected 1 Gbps FICON	1,800.00	1,200.00	900.00	800.00
Unprotected 2 Gbps FICON	1,800.00	1,200.00	900.00	800.00
Unprotected Fibre Channel	1,800.00	1,200.00	900.00	800.00
Unprotected 2Gbps Fibre Channel	1,800.00	1,200.00	900.00	800.00
Unprotected ETR/CLO	1,800.00	1,200.00	900.00	800.00
Unprotected FDDI	1,800.00	1,200.00	900.00	800.00
Unprotected 1.06 Gbps ISC	1,800.00	1,200.00	900.00	800.00
Unprotected 2Gbps ISC3	1,800.00	1,200.00	900.00	800.00
Unprotected Fast Ethernet	1,800.00	1,200.00	900.00	800.00
Unprotected Gigabit Ethernet	1,800.00	1,200.00	900.00	800.00
Unprotected 10Gigabit Ethernet				
LAN-PHY/WAN-PHY	4,200.00	2,800.00	2,100.00	2,000.00
Unprotected D1 Video	1,800.00	1,200.00	900.00	800.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

5. Partial Ring Optical Transport Channels, Point-to-Fiber-Meet Unprotected, Single/Multi-Port Interface (Cont'd)

<u>Interface Type</u>	<u>Monthly Rate</u>			
	<u>1-Year Term</u>	<u>3-Year Term</u>	<u>5-Year Term</u>	<u>7-Year Term</u>
Unprotected 2.5Gbps Multi-Port Facility	\$2,505.00	\$1,670.00	\$1,250.00	\$1,100.00
Unprotected Multi-Port Channel				
ESCON	112.50	112.50	112.50	112.50
Fibre Channel (up to 1Gbps)	112.50	112.50	112.50	112.50
FDDI	112.50	112.50	112.50	112.50
Fast Ethernet	112.50	112.50	112.50	112.50
D1 Video	112.50	112.50	112.50	112.50
OC3/3c	112.50	112.50	112.50	112.50
OC12/12c	112.50	112.50	112.50	112.50
Gigabit Ethernet	112.50	112.50	112.50	112.50
1Gbps FICON	112.50	112.50	112.50	112.50
Unprotected 10Gbps Multi-Port Facility	5,250.00	3,500.00	2,625.00	2,500.00
Unprotected Multi-Port Channel				
Gigabit Ethernet	112.50	112.50	112.50	112.50
1Gbps Fibre Channel	112.50	112.50	112.50	112.50
2Gbps Fibre Channel	112.50	112.50	112.50	112.50
1Gbps FICON	112.50	112.50	112.50	112.50
2Gbps FICON	112.50	112.50	112.50	112.50
OC48/48c	112.50	112.50	112.50	112.50

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

5. Partial Ring Optical Transport Channels, Point-to-Fiber-Meet Protected, Single/Multi-Port Interface (Cont'd)

<u>Interface</u> <u>Type</u>	<u>Monthly Rate</u>			
	<u>1-Year</u> <u>Term</u>	<u>3-Year</u> <u>Term</u>	<u>5-Year</u> <u>Term</u>	<u>7-Year</u> <u>Term</u>
High Speed Pass-Through Interface	n/a	\$5,130.00	\$3,850.00	\$3,825.00
4-Fiber Protected SONET OC3/OC3c	\$2,400.00	\$1,600.00	\$1,200.00	\$1,000.00
4-Fiber Protected SONET OC12/OC12c	2,790.00	1,860.00	1,400.00	1,200.00
4-Fiber Protected SONET OC48/OC48c	3,000.00	2,000.00	1,500.00	1,400.00
4-Fiber Protected SONET OC192/OC192c	8,400.00	5,600.00	4,200.00	4,000.00
Protected SONET OC3/OC3c	1,395.00	930.00	700.00	600.00
Protected SONET OC12/OC12c	1,605.00	1,070.00	800.00	700.00
Protected SONET OC48/OC48c	2,205.00	1,470.00	1,100.00	1,000.00
Protected SONET OC192/OC192c	5,595.00	3,730.00	2,800.00	2,500.00
Protected 1 Gbps FICON	2,205.00	1,470.00	1,100.00	1,000.00
Protected 2 Gbps FICON	2,205.00	1,470.00	1,100.00	1,000.00
Protected Fibre Channel	2,205.00	1,470.00	1,100.00	1,000.00
Protected 2Gbps Fibre Channel	2,205.00	1,470.00	1,100.00	1,000.00
Protected FDDI	2,205.00	1,470.00	1,100.00	1,000.00
Protected 1.06 Gbps ISC	2,205.00	1,470.00	1,100.00	1,000.00
Protected 2Gbps ISC3	2,205.00	1,470.00	1,100.00	1,000.00
Protected Fast Ethernet	2,205.00	1,470.00	1,100.00	1,000.00
Protected Gigabit Ethernet	2,205.00	1,470.00	1,100.00	1,000.00
Protected 10Gigabit Ethernet				
LAN-PHY/WAN-PHY	5,595.00	3,730.00	2,800.00	2,500.00
Protected D1 Video	2,205.00	1,470.00	1,100.00	1,000.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

5. Partial Ring Optical Transport Channels, Point-to-Fiber-Meet Protected, Single/Multi-Port Interface (Cont'd)

<u>Interface Type</u>	<u>Monthly Rate</u>			
	<u>1-Year Term</u>	<u>3-Year Term</u>	<u>5-Year Term</u>	<u>7-Year Term</u>
Protected 2.5Gbps Multi-Port Facility	\$3,000.00	\$2,000.00	\$1,500.00	\$1,350.00
Protected Multi-Port Channel				
ESCON	112.50	112.50	112.50	112.50
Fibre Channel (up to 1Gbps)	112.50	112.50	112.50	112.50
FDDI	112.50	112.50	112.50	112.50
Fast Ethernet	112.50	112.50	112.50	112.50
D1 Video	112.50	112.50	112.50	112.50
OC3/3c	112.50	112.50	112.50	112.50
OC12/12c	112.50	112.50	112.50	112.50
Gigabit Ethernet	112.50	112.50	112.50	112.50
1Gbps FICON	112.50	112.50	112.50	112.50
Protected 10Gbps Multi-Port Facility	6,993.75	4,662.50	3,500.00	3,125.00
Protected Multi-Port Channel				
Gigabit Ethernet	112.50	112.50	112.50	112.50
1Gbps Fibre Channel	112.50	112.50	112.50	112.50
2Gbps Fibre Channel	112.50	112.50	112.50	112.50
1Gbps FICON	112.50	112.50	112.50	112.50
2Gbps FICON	112.50	112.50	112.50	112.50
OC48/48c	112.50	112.50	112.50	112.50

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

6. Partial Ring Protected - Channel Mapping - Nonrecurring Charges,
Per optical transport channel

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
Protected SONET OC3/OC3c	\$ 150.00
Protected SONET OC12/OC12c	150.00
Protected SONET OC48/OC48c	150.00
Protected SONET OC192/OC192c	150.00
Protected 1 Gbps FICON	150.00
Protected 2 Gbps FICON	150.00
Protected 1Gbps Fibre Channel	150.00
Protected 2Gbps Fibre Channel	150.00
Protected FDDI	150.00
Protected 1.06 Gbps ISC	150.00
Protected 2Gbps ISC3	150.00
Protected Fast Ethernet	150.00
Protected Gigabit Ethernet	150.00
Protected 10 Gigabit Ethernet (LAN-PHY/WAN-PHY)	150.00
Protected 2.5Gbps Multi-Port Facility	150.00
Protected Multi-Port Channel	
ESCON	150.00
Fibre Channel (up to 1Gbps)	150.00
FDDI	150.00
Fast Ethernet	150.00
D1 Video	150.00
OC3/3c	150.00
OC12/12c	150.00
Gigabit Ethernet	150.00
1Gbps FICON	150.00
Protected 10Gbps Multi-Port Facility	150.00
Protected Multi-Port Channel	
Gigabit Ethernet	150.00
1Gbps Fibre Channel)	150.00
2Gbps Fibre Channel	150.00
1Gbps FICON	150.00
2Gbps FICON	150.00
OC48/48c	150.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

7. Initial Installation - Nonrecurring Charges,
Per optical transport channel

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
Unprotected SONET OC3/OC3c	\$ 1.00
Unprotected SONET OC12/OC12c	1.00
Unprotected SONET OC48/OC48c	1.00
Unprotected SONET OC192/OC192c	1.00
Unprotected 1Gbps FICON	1.00
Unprotected 2Gbps FICON	1.00
Unprotected 1Gbps Fibre Channel	1.00
Unprotected 2Gbps Fibre Channel	1.00
Unprotected ETR/CLO	1.00
Unprotected FDDI	1.00
Unprotected 1.06 Gbps ISC	1.00
Unprotected 2Gbps ISC3	1.00
Unprotected Fast Ethernet	1.00
Unprotected Gigabit Ethernet	1.00
Unprotected 10 Gigabit Ethernet (LAN-PHY/WAN-PHY)	1.00
Unprotected D1 Video	1.00
Unprotected 2.5Gbps Multi-Port Facility	1.00
Unprotected Multi-Port Channel	
ESCON	1.00
Fibre Channel (up to 1Gbps)	1.00
FDDI	1.00
Fast Ethernet	1.00
D1 Video	1.00
OC3/3c	1.00
OC12/12c	1.00
Gigabit Ethernet	1.00
1Gbps FICON	1.00
Unprotected 10Gbps Multi-Port Facility	1.00
Unprotected Multi-Port Channel	
Gigabit Ethernet	1.00
1Gbps Fibre Channel)	1.00
2Gbps Fibre Channel	1.00
1Gbps FICON	1.00
2Gbps FICON	1.00
OC48/48c	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

7. Initial Installation - Nonrecurring Charges,
Per optical transport channel (Cont'd)

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
4-Fiber Protected SONET OC3/OC3c	\$ 1.00
4-Fiber Protected SONET OC12/OC12c	1.00
4-Fiber Protected SONET OC48/OC48c	1.00
4-Fiber Protected SONET OC192/OC192c	1.00
Protected SONET OC3/OC3c	1.00
Protected SONET OC12/OC12c	1.00
Protected SONET OC48/OC48c	1.00
Protected SONET OC192/OC192c	1.00
Protected 1 Gbps FICON	1.00
Protected 2 Gbps FICON	1.00
Protected Fibre Channel	1.00
Protected 2Gbps Fibre Channel	1.00
Protected FDDI	1.00
Protected 1.06 Gbps ISC	1.00
Protected 2Gbps ISC3	1.00
Protected Fast Ethernet	1.00
Protected Gigabit Ethernet	1.00
Protected 10 Gigabit Ethernet (LAN-PHY/WAN-PHY)	1.00
Protected D1 Video	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

7. Initial Installation - Nonrecurring Charges,
Per optical transport channel (Cont'd)

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
Protected 2.5Gbps Multi-Port Facility	\$ 1.00
Protected Multi-Port Channel	
ESCON	1.00
Fibre Channel (up to 1Gbps)	1.00
FDDI	1.00
Fast Ethernet	1.00
D1 Video	1.00
OC3/3c	1.00
OC12/12c	1.00
Gigabit Ethernet	1.00
1Gbps FICON	1.00
Protected 10Gbps Multi-Port Facility	1.00
Protected Multi-Port Channel	
Gigabit Ethernet	1.00
1Gbps Fibre Channel)	1.00
2Gbps Fibre Channel	1.00
1Gbps FICON	1.00
2Gbps FICON	1.00
OC48/48c	1.00

Dedicated Wavelength Ring

F. Rates and Charges (Cont'd)

8. Subsequent Installation - Nonrecurring Charges,
Per optical transport channel

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
Unprotected SONET OC3/OC3c	\$ 1.00
Unprotected SONET OC12/OC12c	1.00
Unprotected SONET OC48/OC48c	1.00
Unprotected SONET OC192/OC192c	1.00
Unprotected 1Gbps FICON	1.00
Unprotected 2Gbps FICON	1.00
Unprotected 1Gbps Fibre Channel	1.00
Unprotected 2Gbps Fibre Channel	1.00
Unprotected ETR/CLO	1.00
Unprotected FDDI	1.00
Unprotected 1.06 Gbps ISC	1.00
Unprotected 2Gbps ISC3	1.00
Unprotected Fast Ethernet	1.00
Unprotected Gigabit Ethernet	1.00
Unprotected 10 Gigabit Ethernet (LAN-PHY/WAN-PHY)	1.00
Unprotected D1 Video	1.00
Unprotected 2.5Gbps Multi-Port Facility	1.00
Unprotected Multi-Port Channel	
ESCON	1.00
Fibre Channel (up to 1Gbps)	1.00
FDDI	1.00
Fast Ethernet	1.00
D1 Video	1.00
OC3/3c	1.00
OC12/12c	1.00
Gigabit Ethernet	1.00
1Gbps FICON	1.00
Unprotected 10Gbps Multi-Port Facility	1.00
Unprotected Multi-Port Channel	
Gigabit Ethernet	1.00
1Gbps Fibre Channel)	1.00
2Gbps Fibre Channel	1.00
1Gbps FICON	1.00
2Gbps FICON	1.00
OC48/48c	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

8. Subsequent Installation - Nonrecurring Charges,
Per optical transport channel (Cont'd)

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
4-Fiber Protected SONET OC3/OC3c	\$ 1.00
4-Fiber Protected SONET OC12/OC12c	1.00
4-Fiber Protected SONET OC48/OC48c	1.00
4-Fiber Protected SONET OC192/OC192c	1.00
Protected SONET OC3/OC3c	1.00
Protected SONET OC12/OC12c	1.00
Protected SONET OC48/OC48c	1.00
Protected SONET OC192/OC192c	1.00
Protected 1 Gbps FICON	1.00
Protected 2 Gbps FICON	1.00
Protected Fibre Channel	1.00
Protected 2Gbps Fibre Channel	1.00
Protected FDDI	1.00
Protected 1.06 Gbps ISC	1.00
Protected 2Gbps ISC3	1.00
Protected Fast Ethernet	1.00
Protected Gigabit Ethernet	1.00
Protected 10 Gigabit Ethernet (LAN-PHY/WAN-PHY)	1.00
Protected D1 Video	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

8. Subsequent Installation - Nonrecurring Charges,
Per optical transport channel (Cont'd)

<u>Interface Type</u>	<u>Nonrecurring Charge</u>
Protected 2.5Gbps Multi-Port Facility	\$ 1.00
Protected Multi-Port Channel	
ESCON	1.00
Fibre Channel (up to 1Gbps)	1.00
FDDI	1.00
Fast Ethernet	1.00
D1 Video	1.00
OC3/3c	1.00
OC12/12c	1.00
Gigabit Ethernet	1.00
1Gbps FICON	1.00
Protected 10Gbps Multi-Port Facility	1.00
Protected Multi-Port Channel	
Gigabit Ethernet	1.00
1Gbps Fibre Channel)	1.00
2Gbps Fibre Channel	1.00
1Gbps FICON	1.00
2Gbps FICON	1.00
OC48/48c	1.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

9. Optional Features - Network Management Methods

a. Customer Service Management

	<u>Monthly Rate</u>
CSM, per primary ring	
3 year	\$ 450.00
5 year	450.00
7 year	450.00
Customized Reports	ICB
	<u>Nonrecurring Charge</u>
Node Setup, per primary or expansion node on The ring equipped during initial CNM Method Establishment	\$200.00
Initial CSM Setup, first partition with up to 6 users	500.00
Setup of Additional Partition	500.00
Setup of Additional Users, up to 6 additional users	350.00
Add/Remove Node, per primary or expansion node added to, or removed from, the CSM ring subsequent to initial establishment or for a Change in Network Management Method	200.00
Consultation and Support, each 30 minutes or fraction thereof	100.00
Change Network Management Method, from CSM to DTM, per node	200.00

Dedicated Wavelength Ring (DWR)

F. Rates and Charges (Cont'd)

9. Optional Features - Network Management Methods (Cont'd)

b. Direct TL1 Monitoring (DTM)

	<u>Monthly Rate</u>
DTM, per primary ring	
3 year	\$ 450.00
5 year	450.00
7 year	450.00
Customized Reports	ICB
	<u>Nonrecurring Charge</u>
Node Setup, per primary or expansion node on the ring equipped during initial DTM establishment	\$ 200.00
Initial DTM Setup, first partition with up to 6 users	500.00
Add/Remove Node, per primary or expansion node added to, or removed from, the DTM ring subsequent to initial establishment or for a Change in Network Management Method	200.00
Consultation and Support, each 30 minutes or fraction thereof	100.00
Change Network Management Method, from DTM to CSM, per node	200.00