

# PRIVATE LINE SERVICES

## Reliable, secure connections provided over an all-fiber digital network optimize efficiency and flexibility

**M**anaging a corporate telecommunications network effectively is essential for companies hoping to succeed in today's competitive environment. Private line services from Teleport Communications Group (TCG) allow customers of all sizes, from interexchange carriers to small businesses, to configure their networks for maximum reliability, capacity and flexibility.

### Private Line Service Options

To accommodate their unique networking

requirements, TCG users can choose from a number of private line services, including DS0, DS1 and DS3, as well as DS1E (which allows users to accommodate international traffic) and DS2. TCG will also strive to meet a customer's needs by delivering other private line services or developing special applications. TCG's private line services are delivered at 99.9986% availability, a performance level that is significantly higher than that of the regional Bells. Simply put, TCG users will experience less than three minutes of service outages *per year*.

TCG User Application	DS3	DS1	DS0
Definition and Features	A high-capacity service for users with high traffic volume between locations, including interexchange carriers and large businesses. Supports DS1 and DS2 inputs up to 28 DS1s. Clear channel format optional; remote monitoring on alarms. Supports AMI or B8ZS coding of DS1s.	A mid-range service for companies with high volumes to multiple sites, to an IXC or to another high-volume location. Often chosen for LAN interconnections and corporate backbone networks. May be channelized or clear channel. Switch selectable AMI or B8ZS coding. Remote testing, continuous alarm, status and performance monitored. In addition, TCG offers DS1E service for international carriers whose networks operate at the European standard. The DS1E signal is 2.048 Mbps. All other features of DS1E service are identical to standard DS1.	Basic 2-wire, 4-wire and DDS* private line applications, including FX lines, Tie Trunks, Ringdown and "Hoot & Holler" circuits. Fractional and channelized DS1 locations also are provided. Compatible with all standard interfaces. Voice-grade channels are tested continuously for transmission path quality.  *Digital Data Service
Transmission Rate	Up to 12 DS3s (equivalent to 28 DS1s or 672 DS0s)	1.544 Mbps (equivalent to 24 DS0 channels) 2.048 Mbps (DS1E)	Up to 24 DS0s per DS1
Availability	99.9986%	99.9986%	99.9986%
Line Rates	44.738 Mbps	1.544 Mbps 2.048 Mbps (DS1E)	2-wire, 4-wire 2.4 Kb - 56 Kb, 64 Kb, 128 Kb, 256 Kb



# PRIVATE LINE SERVICES

## Customer Benefits

**Ensures reliable, flexible communications:** TCG's private line services provide choice, flexibility, and redundancy at a flat monthly rate, regardless of how much traffic is transmitted.

**Leading-edge technology:** The benefits of TCG's fiber-optic networks include alternative routing for increased network security; 24-hour performance monitoring on all circuits; unmatched availability; disaster avoidance planning. TCG's network features redundant fiber pairs in every route, automatic switching protection and electronic redundancy.

**Custom Network Solutions:** TCG offers different types of private lines, operating at different speeds and handling varying amounts of traffic, to meet individual customer needs.

**Growth on demand:** TCG can quickly install additional circuits, making network expansion cost-efficient and reliable.

## Additional Information

DS1E, the European standard for DS1 service at 2.048 Mbps, is a unique service offering by

TCG that provides local access service to international private line carriers. Before TCG offered DS1E service, customers had to purchase two 1.544 Mbps services and special CPE to obtain the desired 2.048 Mbps signal.

## About TCG

Teleport Communications Group (TCG) is the nation's premier competitive local telecommunications provider. TCG's fiber optic network now encompasses over 150 communities nationwide. We currently serve businesses in the following metropolitan areas: Boston, Chicago, Dallas, Suburban Detroit, Fort Lauderdale, Hartford, Houston, Los Angeles, Miami, Milwaukee, New York, Omaha, Phoenix, San Diego, San Francisco, Seattle, Southern New Jersey, St. Louis, and West Palm Beach. For over ten years TCG has been pioneering advances in the area of enhanced voice, data, and video communications. Diversity, quality, reliability, responsive service, advanced technology and comprehensive service offerings — all at competitive rates — good reasons why businesses from coast-to-coast have come to trust TCG.

For more information on TCG Private Line Service®,  
call us at

**1-800-969-5686**

One Teleport Drive, Staten Island, NY 10311-1011

# **TCG**

# LANLINK SERVICES

## A low-risk, cost-effective solution for LAN-to-LAN connectivity

**L**ANLINK is a high speed (4, 10, or 16 Mbps) dedicated transport service for the inter-connection of Local Area Networks (LANs) within a single metropolitan area. Serving as a basic LAN extension for 4 or 16 Mbps Token Ring LANs or 10 Mbps Ethernet LANs, LANLINK can connect two or more similar LANs within a metropolitan area, and eliminate the bottlenecks that typically occur with T1 and 56K interconnections.

With LANLINK, the need to purchase, install, and maintain expensive LAN bridges that connect at lower speeds is eliminated. TCG's LANLINK service includes the installation and maintenance of bridging hardware for Ethernet LANs, and repeater hardware for Token Ring LANs. This hardware, the ADC/Fibermux Magnum 100<sup>1</sup>, assures connectivity at your LAN's native speed — 4 or 16 Mbps for Token Ring LANs and 10 Mbps for Ethernet LANs. By matching the native transmission speed of the LAN, LANLINK guarantees transmission capacity and bandwidth availability for virtually any LAN application users require.

### Customer Benefits

**Interface at Customer Site:** Unlike LAN transport services provided by TCG competitors, TCG installs the hardware directly at your demarcation point in your office, rather than in a common space, usually the basement or lower level of a building.

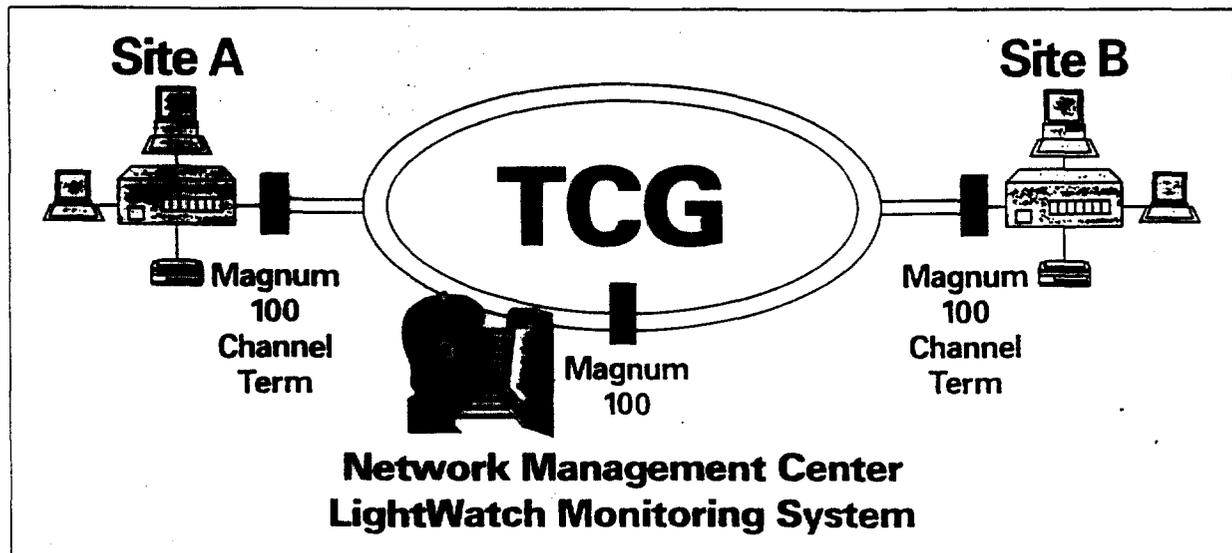
Common space architecture usually means having to run cabling from your private LAN to the common space area. In many cases, this is an unacceptable security risk due to the possibility of unauthorized persons tapping into your LAN.

With LANLINK, it's secured in your premises.

**Dedicated Secure Facilities:** Only one customer is installed on a LANLINK "ring". Unlike the shared-backbone FDDI services offered by others, there is absolutely no risk of one customer inadvertently receiving another's data with LANLINK.

Only one customer is installed on an ADC/Fibermux Magnum 100 unit. Unlike some TCG competitors who install the same unit in a common area, and

*continued on other side*



# TCG

# LANLINK SERVICES

*continued from other side*

install multiple customers on the unit, each LANLINK customer enjoys the benefit of dedicated facilities.

LANLINK is DEDICATED to you, thus providing one of the most highly secure services available today.

**Constant Proactive Monitoring:** When TCG installs dedicated units at your site, we also install a corresponding dedicated unit at our node site. This enables TCG's Network Management Center (NMC) to monitor your LANLINK services 24 hours a day, seven days a week.

With this unit installed, our technicians are immediately alerted to any potential problem. For example, if one of the power units fails, the other power unit automatically and transparently takes over. With the LightWatch<sup>1</sup> monitoring system activated, the TCG NMC is immediately alerted, and will dispatch a technician to replace the failed unit.

**Redundant Transport Option:** Adding to this level of reliability is the Magnum's ability to support a dual, counter-rotating ring architecture. When the redundant fiber option is purchased and installed, the self-healing mechanism enhances network reliability by establishing two separate fiber paths between LANLINK sites — even when connecting just two LAN segments. This means that if the primary fiber path is disrupted for any reason, the secondary path will be automatically activated, without disruption of service.

## Technical Information

**Ethernet:** In an Ethernet LAN, LANLINK can function as either a repeater or bridge. The connection to

TCG is a simple IEEE 802.3 female DB15 (10Base5) AUI connector from your LAN or existing router. For LANs that are based on 10BaseT (twisted pair) or fiber, a simple media converter will provide the necessary connection for LANLINK. The allowable distance between TCG equipment and your LAN is 164 feet when using an electrical transceiver cable.

**Token Ring:** In a Token Ring LAN, LANLINK functions as a repeater. The connection to TCG is a simple IEEE 802.5 female DB9 connector from your LAN or existing router. For LANs that are based on 10BaseT (twisted pair) or fiber, a simple media converter will provide the necessary connection for LANLINK. The allowable distance between TCG equipment and your LAN is 300 feet when using a Type 1 cable.

## About TCG

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For more information on TCG LANLINK service,  
call us at  
**1-800-969-5686**  
One Teleport Drive, Staten Island, NY 10311-1011

# TCG

The *other* local phone company™

# SWITCHED DATA SERVICES

## A comprehensive family of LAN, MAN and WAN services based on an Asynchronous Transfer Mode (ATM) and SONET Backbone

TCG Switched Data Services offer customers a variety of advanced, high-speed data communications services. They provide the highest standards in reliability and flexibility while enabling users to reduce the operational costs associated with interconnecting various geographically dispersed and architecturally diverse locations. These Switched Data Services fully complement the TCG line of Dedicated Data Services.

Since 1984, TCG has been the leading provider of optical digital infrastructure in major metropolitan areas. This infrastructure offers users their platform of choice for interconnecting data traffic at rates ranging from 9.6 Kbps to 2.4 Gbps. The proactively monitored and maintained TCG LANLINK service has set a new standard of reliability for many TCG customers, by offering LAN handoffs at native Ethernet or Token Ring rates.

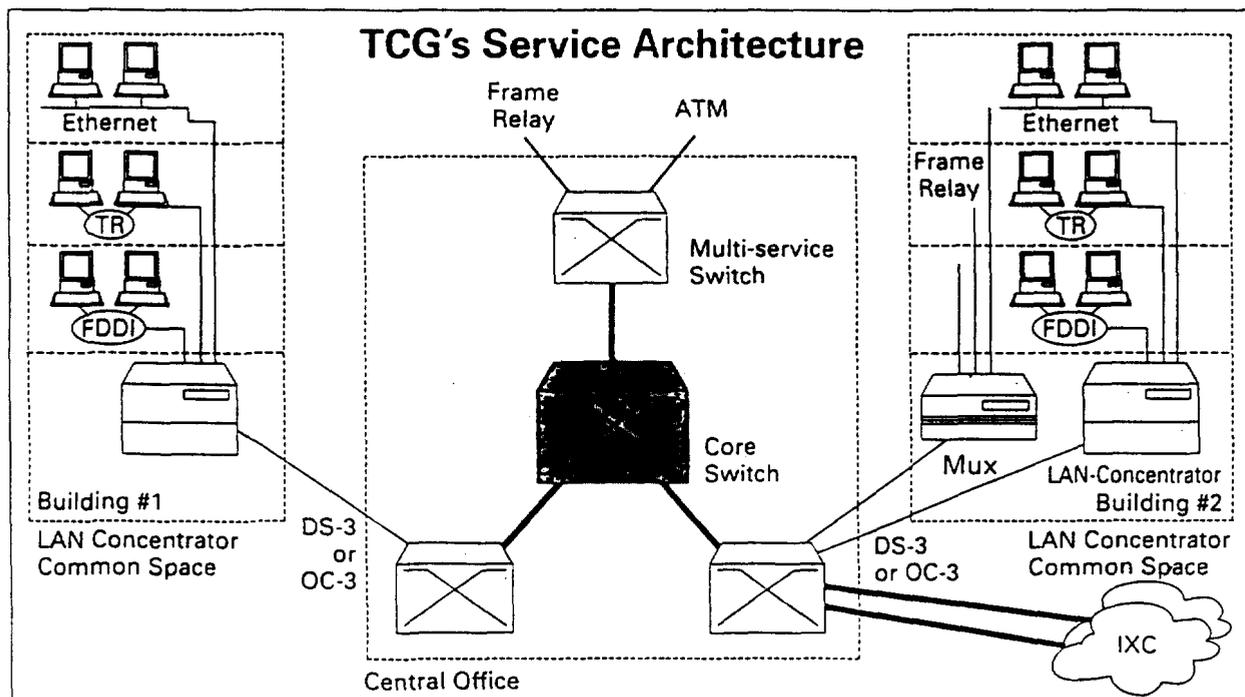
TCG Switched Data Services consist of Ethernet, Token Ring, FDDI, Frame Relay and native ATM. They are transported over an ATM/SONET backbone and are based on state-of-the-art architecture which automatically formats all services in ATM cells. TCG Switched Data Services offer customers their choice in connectivity to all major Interexchange Carriers, using both ATM and Frame Relay Network-to-Network (NND) interfaces.

### Architecture

Based on the tiered architectural design shown below, ATM-LAN Concentrators are deployed within Common Space locations near customer premises, where they collect the user traffic at its origins and then translate it into ATM format. The ATM cells are then carried to the Central Office via high speed ATM trunks (DS-3, OC-3, OC-12).

Within the Central Office, two levels of ATM switches exist. The first level consists of the "multi-service" switches that home the ATM-LAN Concentrator traffic and also directly serves ATM (DS-1, DS-3, OC-3) and Frame Relay connections via corresponding interface modules. The "multi-service" edge switches in the Central Office are in turn inter-connected via "core" ATM switches.

This architecture allows for ATM to Frame Relay "Interworking", as compliant to industry standards, as well as Ethernet-to-FDDI "Remote Translational Bridging". Standards compliance is based on ITU, ANSI, IEEE, ATM Forum, Frame Relay Forum, IETF and other industry standards.



# TCG

# SWITCHED DATA SERVICES

## Service Structure

The list of services carried over our ATM backbone and offered under the TCG Switched Data Services family of products are:

- ATM DS-3
- ATM OC-3
- Frame Relay at T1 and Sub-T1 Rates
- Ethernet (IEEE 802.3)
- Token Ring (IEEE 802.5)
- FDDI (ANSI X3T9.5)

## Pricing

To meet the variety of individual customer's requirements, TCG offers a choice of billing options:

- **Flat Charge:**  
This option is appropriate for direct LAN interconnection, where the customer is charged each month with a flat monthly fee for each user port in use.
- **Tiered Structured Billing:**  
This option is most suitable for Frame Relay and ATM services. Charges are based on the circuit rate, committed transmission rate and excess transmission rate.
- **Usage Based Billing:**  
Based on this billing system, the monthly charge is proportional to the traffic transmitted.

## Traffic Management

TCG's Switched Data Services architecture is based on the latest cell switching equipment, that was selected through an extensive evaluation process.

Advanced methods of congestion avoidance, flow control and traffic shaping enable TCG to provide the highest performance services in the marketplace. Combined with the most technologically advanced backbone, it enables legacy as well as multimedia traffic to be carried with performance and reliability substantially better than private line data services.

TCG's ATM infrastructure allows for the prioritization of traffic based on the nature of the applications.

This prioritization is based on cell loss, cell delay and cell delay variance thereby allowing the transport of real time traffic.

## Network Management

All elements of TCG's Switched Data Services network are monitored in-band on an end-to-end basis. The Network Management Center (NMC), located at TCG's New York headquarters, provides local monitoring in each city and integrated onto a single platform.

TCG's telemetry network, as well as the NMC, are fully redundant. All devices in this network support the option of central logic redundancy, power supply redundancy and 1:N interface card redundancy. The modules are hot-swappable.

Evolving with the market demand, TCG Switched Data Services allow customers to monitor and manage their individual Virtual Private Network (VPN). Each VPN is securely separated from any other traffic on the network. Customer specific usage reports are provided which may be used to optimize traffic engineering.

## About TCG

Teleport Communications Group (TCG) is the nation's premier competitive local telecommunications provider. As of May 1995, TCG's fiber optic network encompassed more than 200 communities in 37 major markets. TCG serves users coast-to-coast, including the metropolitan areas of Baltimore, Boston, Chicago, Dallas, Detroit, Fort Lauderdale, Hartford, Houston, Los Angeles, Miami, Milwaukee, New York, Omaha, Phoenix, Pittsburgh, Princeton, San Diego, San Francisco, Seattle, St. Louis, and West Palm Beach.

For over ten years, TCG has been pioneering advances in the area of enhanced voice, data, and image communications. Diversity, quality, reliability, responsive service, advanced technology and comprehensive service offerings — all at competitive rates — good reasons why business telecommunications users from coast-to-coast have come to trust TCG.

For more information call us at  
**1-800-889-4TCG**

One Teleport Drive, Staten Island, NY 10311-1011

# TCG

The *other* local phone company<sup>SM</sup>



ONE TOWER LANE, SUITE 1600  
OAKBROOK TERRACE, ILLINOIS 60181  
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FAX (708) 218-0018

## CORPORATE FACT SHEET

### Company Background

MFS Communications Company, Inc. (MFS) is a leading provider of communications services for business. As an integrated telecommunications company, MFS provides a wide range of high quality voice, data and other enhanced services and systems specifically designed to meet the requirements of business and government customers.

MFS operates through its operating companies in two business segments: Telecommunications Services, through MFS Telecom, MFS Intelenet, MFS Datanet, and internationally, through MFS International; and Network Systems Integration and Facilities Management Services, through MFS Network Technologies.

Headquartered in Omaha, Nebraska, MFS was founded in 1987 and began operations in 1988. MFS' common stock is traded on the Nasdaq Stock Market under the symbol MFST.

### Operating Companies

- **MFS Telecom, Inc., Oakbrook Terrace, Illinois** - MFS Telecom, Inc. is the nation's largest Competitive Access Provider (CAP), offering local private line and special access digital communications services on fiber optic networks that it operates in major metropolitan business centers throughout the United States.
- **MFS Datanet, Inc., San Jose, California** - MFS Datanet, Inc. offers advanced data communications services and is the first company to make high-speed Local Area Network (LAN) and computer connectivity services commercially available in the United States.
- **MFS Intelenet, Inc., Parsippany, New Jersey and San Francisco, California** - MFS Intelenet, Inc. is the nation's only full service facilities-based telecommunications company designed exclusively to meet the needs of medium and small businesses by providing both local and long distance calling, as well as telemanagement service.
- **MFS International, Inc., Vienna, Virginia** - MFS International, Inc. was created in part to take advantage of MFS' large multinational customer base. The company began to provide telecommunications services to London-based business and government users in mid-1994 and recently announced service in Frankfurt, Germany. MFS International is currently building a network in Paris, France and is exploring other international development opportunities.

- **MFS Network Technologies, Inc., Omaha, Nebraska** - MFS Network Technologies, Inc. designs, develops and manages the installation of MFS' fiber optic networks and network expansion. The company also provides development, design and engineering, project management, construction and support of networks and systems for third parties.
- **MFS Business Development Unit, Westmont, Illinois** - MFS Development is a division of MFS that acts as a central network development resource for technical and strategic planning and implementation.

### MFS Networks

MFS has fiber optic networks operating in a number of major metropolitan areas, including the following locations:

Albany, NY  
 Atlanta, GA  
 Baltimore, MD  
 Boston, MA  
 Buffalo, NY  
 Chicago, IL  
 Dallas, TX

Frankfurt, Germany  
 Houston, TX  
 London, England  
 Los Angeles, CA  
 Minneapolis, MN  
 New York, NY  
 Northern New Jersey

Philadelphia, PA  
 Pittsburgh, PA  
 Rochester, NY  
 St. Louis, MO  
 San Francisco, CA  
 Washington, DC  
 Wilmington, DE

Fiber optic networks currently under development include:

Cleveland, OH  
 Detroit, MI  
 Hartford, CT  
 Indianapolis, IN  
 Miami, FL  
 Oakland, CA  
 Paris, France

Phoenix, AZ  
 Portland, OR  
 San Diego, CA  
 San Jose - Silicon Valley, CA  
 Seattle, WA  
 Tampa, FL

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**MFS TELECOM, INC.**

*MFS Telecom is the nation's largest competitive local access provider of voice, data and video communications services, serving major metropolitan business centers throughout the U.S. MFS Telecom provides the highest quality local access connections available on 100% fiber optic networks, plus superior service, reliability and value. MFS Telecom is currently operational in Atlanta, Baltimore, Boston, Chicago, Dallas, Houston, Los Angeles, Minneapolis, New York City, Northern New Jersey, Philadelphia, Pittsburgh, San Francisco and Washington, D.C.*

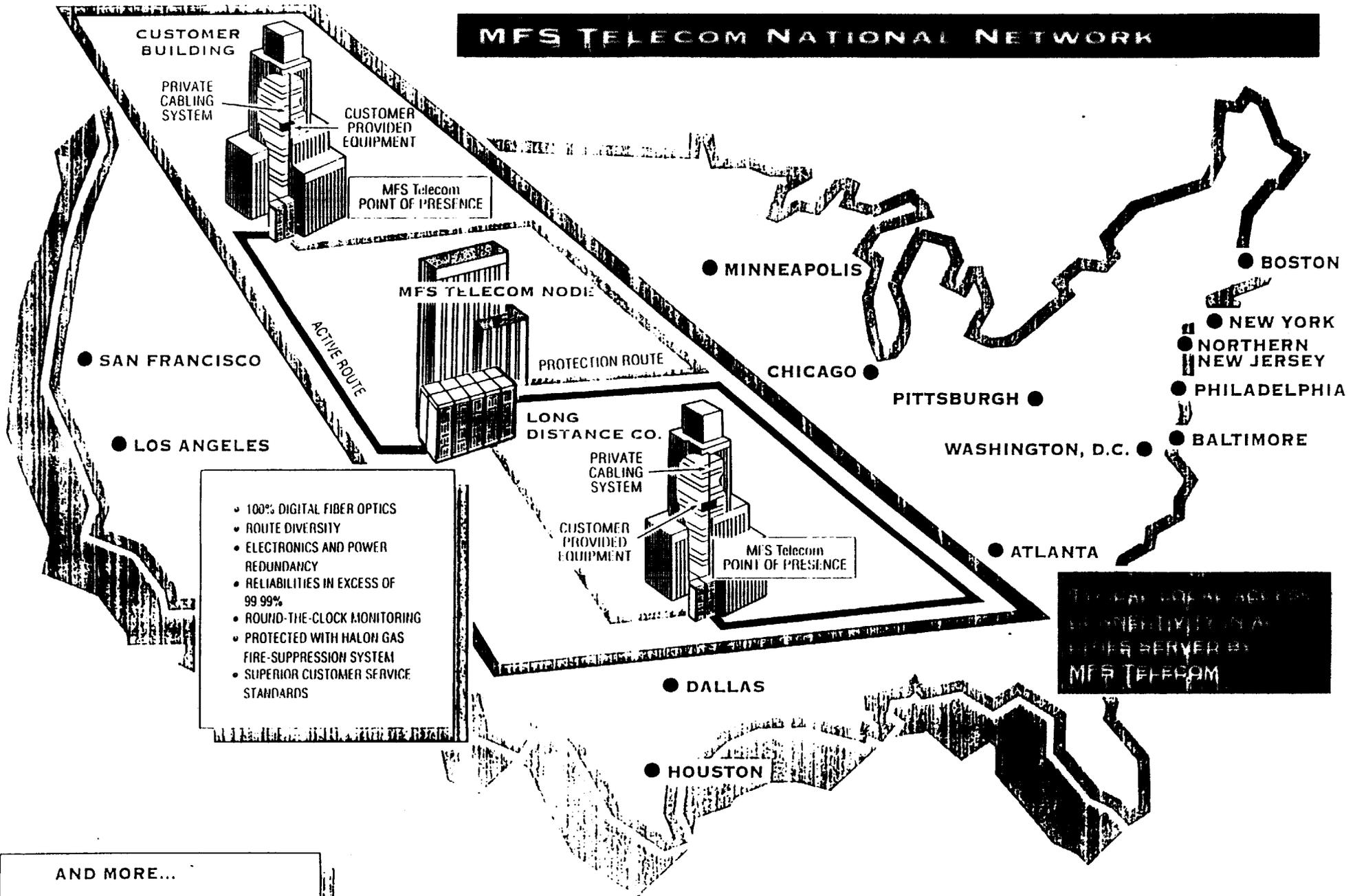
**SERVICE BENEFITS**

- Responsive and Unique Customer Solutions provided by MFS Telecom's highly-skilled service organization.
- Superior Customer Service Standards, including service installation intervals of 3 to 11 days or less and circuit repair intervals of 90 minutes or less.
- Complete Network Security and Protection provided by 24 hour network surveillance from the MFS Telecom Network Operations Control Center and Halon gas fire-suppression systems installed at each MFS Telecom local operations center.
- Diversified line of MFS Telecom products and services including:
  - **MetroFiber Digital Services<sub>sm</sub>** product line: Voice Grade, Analog Data, Digital Data (including DDS), Fractional T-1, DS-1, DS-3, E-1, Hubbing and Multiplexing services.
  - **MetroFiber-Interconnection Services:** C.O. nnection, C.O. Link Services.
  - **MetroFiber Multi-Megabit Data Services (MDS):** MDS Ethernet, Token Ring and FDDI Connection services; MDS Computer Channel Extension services.
  - **MetroFiber Network Reconfiguration & Monitoring Service (NRMS)**

**TECHNICAL BENEFITS**

- Clear Error-Free Transmission ensured by 100% digital fiber optics in all MFS Telecom networks
- Network Availability in excess of 99.99% and Disaster Protection guaranteed by:
  - **Route Diversity:** Two separate routes serve all buildings on each MFS Telecom network.
  - **Electronics and Power Redundancy:** Redundant electronics ensure immediate backup of electronic components at each MFS Telecom building in the event of an equipment failure. If a failure should occur on a primary route or system, the network will automatically switch to the backup route or system in less than 29 milliseconds, a time imperceptible to the user.
  - **Round-the-Clock Monitoring:** Monitoring of each local network with a state-of-the-art network management system. MFS Telecom's service record is unsurpassed. Often a circuit trouble is detected and diagnosed by an MFS Telecom technician and reported to the customer before they even notice a problem.

# MFS TELECOM NATIONAL NETWORK



- 100% DIGITAL FIBER OPTICS
- ROUTE DIVERSITY
- ELECTRONICS AND POWER REDUNDANCY
- RELIABILITIES IN EXCESS OF 99.99%
- ROUND-THE-CLOCK MONITORING
- PROTECTED WITH HALON GAS FIRE-SUPPRESSION SYSTEM
- SUPERIOR CUSTOMER SERVICE STANDARDS

TELEPHONE NETWORK  
 CAPABILITY IN A  
 SERVER BY  
 MFS TELECOM

- AND MORE...**
- VOICE, DATA AND VIDEO SERVICES
  - RESPONSIVE CUSTOMER SOLUTIONS
  - 3-11 DAY INSTALLATION INTERVALS
  - 90 MINUTES OR LESS CIRCUIT REPAIR INTERVALS
  - COMPETITIVE PRICING

**MFS TELECOM**

**NETWORK OPERATIONS CONTROL CENTER (NOCC)**

*The Network Operations Control Center (NOCC) is the nucleus for all circuit activity on the Metropolitan Fiber Systems networks nationwide.*



Highly skilled individuals work round-the-clock to ensure superior communications service on a consistent basis. In the event of a degradation or interruption of service, immediate 24-hour technical assistance is available to MFS customers. By dialing 1-800-MFS-CITY, customers will directly reach a Network Operations Control Center (NOCC) technician. This skilled professional has the knowledge to troubleshoot, diagnose, and solve problems and to provide telephone updates on the status of service reports. An enhanced escalation procedure ensures that any network problem is resolved to the customer's satisfaction.

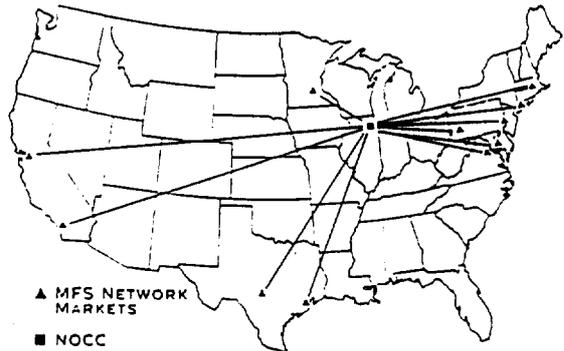
**24-HOUR CUSTOMER SERVICE STANDARDS**

MFS network service standards are unsurpassed. Operations personnel are committed to resolving any network outage within one hour or less, well below the industry average.

**REMOTE DIAGNOSTIC CAPABILITIES**

The NOCC provides a full range of network surveillance functions for every transmission circuit MFS operates. System alarms are usually detected within 60 seconds and equipment problems that occur anywhere on the MFS network can be tested from the NOCC located at MFS Headquarters in Oakbrook Terrace, Illinois. The NOCC surveillance equipment is so precise that more than 25% of circuit troubles are initially detected by MFS technicians, reported to the customer and diagnosed before the customer has even noticed a problem.

**MFS MARKETS**



**METROFIBER DIGITAL SERVICES<sub>SM</sub>**

Supported by the 100% digital fiber optic network, MFS Telecom's MetroFiber Digital Services provide the highest service standards in connecting customers to long distance carriers or to another separate location on an MFS Telecom network. All MFS Telecom digital networks provide automatically activated back-up electronics and fiber optic routes for disaster protection, plus cabling systems for internal building distribution. MFS Telecom networks exceed reliabilities of 99.99% and are monitored 24 hours a day.

**METROFIBER<sub>SM</sub> DIGITAL DATA SERVICES**

Designed for companies that require a Digital Data Service (DDS) channel for digital data applications. MetroFiber DDS is the preferred product for transitioning analog data networks to digital and provides transmission speeds of 2.4, 4.8, 9.6, 19.2, 56 and 64 Kbps.

**METROFIBER<sub>SM</sub> ANALOG**

MetroFiber Analog service will enhance 2-wire and 4-wire voice or analog data applications by providing a single channel transmission path. This service is compatible with either 2-wire ground and loop start equipment or 4-wire E/M signalling equipment. The 4-wire service supports analog data transmission speeds of up to 19.2 Kbps.

**METROFIBER<sub>SM</sub> FRACTIONAL DS-1**

For companies requiring a 56 Kbps or 64 Kbps clear channel for digital data, voice or video, MetroFiber Fractional DS-1 provides superior digital quality at a competitive price. Unchannelized DS-1 is available at intermediate bit rates (IBRs), in increments of either 56 Kbps or 64 Kbps, (E.G. 128 Kbps, 256 Kbps, 384 Kbps, 512 Kbps, 768 Kbps up to 1.544 Mbps) and can be tailored to meet individual customer requirements.

**METROFIBER<sub>SM</sub> DS-1**

MetroFiber DS-1 is a digital transmission facility of 1.544 Mbps with a capacity of up to 24 analog or digital channels that supports voice, analog data, digital data, and video applications. Commonly used for PBX and DS-1 multiplexer (Channel Bank) applications, it provides the digital fiber optic medium to support all dynamically changing networking needs.

**METROFIBER<sub>SM</sub> MULTIPLEXED DS-1**

For companies requiring up to 24 analog or digital channels, Multiplexed DS-1 delivers 24 voice, analog data, or digital data circuits to the originating demarcation point and a full DS-1 (1.544 Mbps) to the terminating demarcation point. MFS Telecom dedicates an intelligent DS-1 multiplexer and DS-1 for a company's exclusive use. The DS-1 multiplexer can be configured for the individual voice, analog data or digital data channels to be terminated to the customers voice, data, or video equipment.

**METROFIBER<sub>SM</sub> DS-1 HUB**

The MetroFiber DS-1 Hub is designed for private companies, government users and long distance carriers that require collection or distribution of up to 24 analog or digital channels to multiple locations on the MFS Telecom network. The MFS Telecom DS-1 Hub to DS-0 Digital Cross Connect System (DCS) offers users the efficient and cost effective local distribution of voice, analog data and digital data.

#### **METROFIBER<sub>sm</sub> E-1**

For companies with international requirements for voice, data, and video, MetroFiber E-1 provides a digital transmission facility of 2.048 Mbs. MetroFiber E-1 is commonly used for international private line applications, and provides the digital fiber optic medium to support all dynamically changing networking needs.

#### **METROFIBER<sub>sm</sub> DS-3**

For companies and long distance carriers requiring up to 28 DS-1's between two locations on the MFS Telecom network, MetroFiber DS-3 (45 Mbs) service provides economy and flexibility with a capacity for 672 voice, analog data, or digital data channels. A single 45 Mbs transmission path supports broadband requirements.

#### **METROFIBER<sub>sm</sub> DS-3 HUB**

MetroFiber DS-3 Hub service supports commercial, government and carrier customers by carrying individual or multiple DS-1 channels to multiple locations on the MFS Telecom network. MetroFiber DS-3 Hub is designed for the collection or distribution of up to 28 DS-1's to multiple locations on the network. Key service features include flexibility, economy, and quick installation intervals.

#### **METROFIBER<sub>sm</sub> SONET**

For companies with multiple sites requiring truly fault tolerant private networks. MetroFiber SONET services deliver transmission payloads ranging from STS-1 to OC-48.

#### **METROFIBER<sub>sm</sub> NETWORK RECONFIGURATION & MONITORING SERVICE (NRMS)**

For companies with multiple long distance carriers, MetroFiber Network Reconfiguration & Monitoring Service (NRMS) provides access into the MFS Telecom Digital Cross Connect System (DCS) enabling customers to re-route their own network from primary to secondary sites.

**METROFIBER<sup>®</sup> DIGITAL DATA SERVICE**

**PRODUCT PROFILE**

Designed for companies that require a Digital Data Service (DDS) channel for digital data applications, MetroFiber DDS provides the highest available standards to connect two locations on the MFS network (where permitted), or a customer location to long distance carriers offering DDS products. MetroFiber DDS is the preferred product for users transitioning their analog data networks to digital and provides transmission speeds of 2.4, 4.8, 9.6, 19.2, 56 and 64 Kbps.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- Point-to-Point Service or as DDS channel end link on a DS-1 hub
- 4-Wire Customer Interface Termination
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- Digital Data
- LAN Internetworking
- Video Conferencing
- Local Loop for long distance carriers' DDS services, including switched 56 Kbps

**METROFIBER<sub>®</sub> FRACTIONAL T-1**

**PRODUCT PROFILE**

For companies requiring fractional T-1 Intermediate Bit Rate (IBR) channels for digital data, voice or video, MetroFiber Fractional T-1 provides superior digital quality over traditional analog communications at a competitive price. Customer requirements may be to either connect between two locations on the MFS network (where permitted), or to long distance carriers. Fractional T-1 is available at Intermediate Bit Rates (IBRs), in increments of either 56 Kbps or 64 Kbps, e.g. 128 Kbps, 256 Kbps, 384 Kbps, 512 Kbps, and 768 Kbps, up to 1.544 Mbps T-1 rates.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- Point-to-Point Service, or as a fractional T-1 channel end link on a DS-1 Hub
- Channelized DS-1, providing channels in increments of either 56 Kbps or 64 Kbps. As a standard, multiple ordered channels will be adjoined.
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- Meets standards for all long distance carrier fractional T-1 offerings
- Supports B8ZS line Code, ESF Framing
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- Digital Data
- LAN Internetworking
- Video Conferencing
- Digital Facsimile
- Local Loop for long distance carriers' fractional T-1 or international services

**METROFIBER DS-1****PRODUCT PROFILE**

MetroFiber DS-1 is a digital transmission facility of 1.544 Mbps with a capacity of up to 24 analog or digital channels that supports voice, analog data, digital data, and video applications. Commonly used for PBX and T-1 Multiplexer (Channel Bank) applications, it provides the digital fiber optic medium to support all dynamically changing networking needs. Using a single 1.544 Mbps transmission path to support voice, data, and video applications, MetroFiber DS-1 can be used between a customer and a long distance carrier or between two customer locations on the MFS Telecom network.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- Point-to-Point Service
- Digital DS-1 Customer Interface Termination (ABAM)
- Transmission rate of 1.544 Mbps
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- Line Codes: AMI or B8ZS
- Framing: SF (D4) or ESF
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- Private Line and WATS Dedicated T-1 long distance carrier service
- PBX and T-1 Multiplexer Connectivity
- Voice
- Analog Data
- Digital Data
- Frame Relay
- LAN Internetworking
- Video Conferencing
- Computer Channel Extension
- Local Loop for long distance carriers' fractional T-1 or T-1 standby services

**METROFIBER<sub>SM</sub> DS-1 HUB****PRODUCT PROFILE**

The MetroFiber DS-1 Hub is designed for companies and long distance carriers that require an individual collection or distribution of up to 24 analog or digital channels to multiple locations on the MFS network. The MFS DS-1 Hub to DS-0 Digital Cross Connect System (DCCS) offers users the efficient and cost effective local distribution of voice, analog data, and digital data.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- DS-1 Hub with up to 24 analog or digital channel (DS-0) end links to multiple locations
- DS-1 to DS-0 Digital Cross Connect System (DCCS) technology
- Provides Flexibility and Responsiveness
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- Voice
- Analog Data (up to 19.2 Kbps)
- Dedicated Access Lines (DAL) for WATS
- Digital Data Service (DDS)
- Fractional T-1

**METROFIBER DS-3****PRODUCT PROFILE**

For companies and long distance carriers requiring up to 28 DS-1s between two locations on the MFS Telecom network, MetroFiber DS-3 (45 Mbps) service provides economy and flexibility with a capacity for 672 voice, analog data, or digital data channels. A single 45 Mbps transmission path supports broadband requirements between your company location to a long distance carrier or between two separate locations on the MFS Telecom network.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- Point-to-Point Service
- Transmission Rate of 44.736 Mbps
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- High Volume Voice, Analog Data, or Digital Data
- Broadband Data
- Full Motion Video
- LAN Internetworking
- Computer Channel Extension

**METROFIBER<sub>®</sub> BROADCAST QUALITY VIDEO SERVICE****PRODUCT PROFILE**

For companies with broadcast quality video conferencing requirements—television networks or affiliates, independent television stations, long distance carriers, and satellite or radio carriers — MetroFiber Broadcast Quality Video Service provides broadcast quality full-motion video, for distribution between a customer and long distance carriers or between two customer locations on the MFS network.

- A single FM simplex (one-way) analog signal provides up to either 10 MHz or 20 MHz of bandwidth, carried on single mode fiber optics for broadcast quality video. The service may be configured to meet specifications for either RS-250-C Short Haul (NTSC) and ANSI T1.502, PAL, SECAM, or B-MAC. As an option the service may be configured duplex for two-way communications.

**SERVICE CHARACTERISTICS**

- 100% Single Mode Fiber Optics
- Simplex (one-way) or Duplex (two-way) System Configuration
- Point-to-Point or Multi-drop Broadcast Service
- Automatically Activated Back-up Power
- Second Stereo Audio System available
- Automatically Activated Back-up Electronics available
- Diverse Fiber Optic Routing available

**PERFORMANCE CHARACTERISTICS**

- Electronics Industry Association (EIA) RS-250-C short haul specification
  - One NTSC video channel
  - One stereo audio system
- American National Standards Institute (ANSI) T1.502 specification
- Optionally Supports PAL, SECAM and B-MAC Standards
- 24-Hour Network Surveillance Monitoring

**PRODUCT APPLICATIONS**

- Television Studio to Uplink/Downlink Facilities
- Television Studio to Transmitter Facilities
- Remote Site to Television Studio
- Local Access Channel to Long Distance Video Provider
- Full-Motion Broadcast Quality Video Conferencing

## METROFIBER MULTI-MEGABIT DATA SERVICES (MDS)

Metropolitan Fiber Systems' (MFS) MetroFiber Multi-Megabit Data Services (MDS) is the first commercially available line of Local Area Network (LAN) and high-speed connectivity services that provide high-speed networking solutions today with today's technology. The MetroFiber MDS product line eliminates the Metropolitan Area Network (MAN) data pipeline bottleneck to allow corporate, medical and academic research customers to affordably and easily implement high-speed applications such as imaging, concurrent engineering and distributed computing. Whether a customer requires connectivity within a department, across town or to a long distance carrier, MetroFiber MDS offers the total turnkey high-speed solution. MFS provides all required transmission equipment, 100% fiber optic capacity, and round-the-clock network management at an affordable price.

Four services are offered in the MFS MetroFiber MDS line to provide connectivity between multiple Fiber Distributed Data Interface (FDDI), Ethernet and Token Ring LANs and high performance computer systems, as well as a metropolitan area gateway for high-speed wide area networking.\*

### SERVICE PROFILE

**MetroFiber<sub>sm</sub> MDS Ethernet Connection:** For companies that need to connect Ethernet LANs between two or more locations within a metropolitan area, MetroFiber MDS Ethernet Connection is available in three service versions that offer price/performance options for a variety of applications. The dedicated and virtual versions provide native Ethernet 10 Mbs throughput, while the fractional version provides fractional throughput of Ethernet LANs for applications not requiring full Ethernet data rates. All versions utilize the IEEE 802.3 Ethernet standard electrical interface.

**MetroFiber<sub>sm</sub> MDS Token Ring Connection:** MetroFiber MDS Token Ring Connection is available in three versions to provide customers with connectivity for a variety of Token Ring LAN applications with the greatest possible flexibility and price/performance options. The dedicated and virtual versions provide native Token Ring 4 Mbs or 16 Mbs throughput, while the fractional version offers

fractional throughput of Token Ring for applications not requiring full Token Ring data rates. All versions utilize the IEEE 802.5 Token Ring standard for the electrical interface.

**MetroFiber<sub>sm</sub> MDS FDDI Connection:** The fastest product in the MetroFiber MDS product line, MetroFiber MDS FDDI Connection, provides Fiber Distributed Data Interface (FDDI) single- or dual-attached optical interface on a virtual connection basis up to native 100 Mbs FDDI rates. MetroFiber FDDI Connection provides FDDI native throughput speeds, which **cannot be achieved by any other transmission medium**. The Service meets ANSI X3T9.5 FDDI standards for interoperability using the physical optical interface MIC connector with customer premises equipment.

\* Services are initially available on the MFS Houston network.

## SERVICE PROFILE (CONTINUED)

**MetroFiber<sub>sm</sub> MDS Computer Channel Extension:** the MetroFiber MDS Computer Channel Extension service is designed for customers that need to connect high performance computer systems within a metropolitan area at native computer channel rates, such as 2, 3, or 4.5 megabytes per second. The service supports IBM and IBM-like channel devices and has a channel-attached bus and tag cable interface. Each customer's application will be specifically engineered to ensure throughput.

## SERVICE CHARACTERISTICS

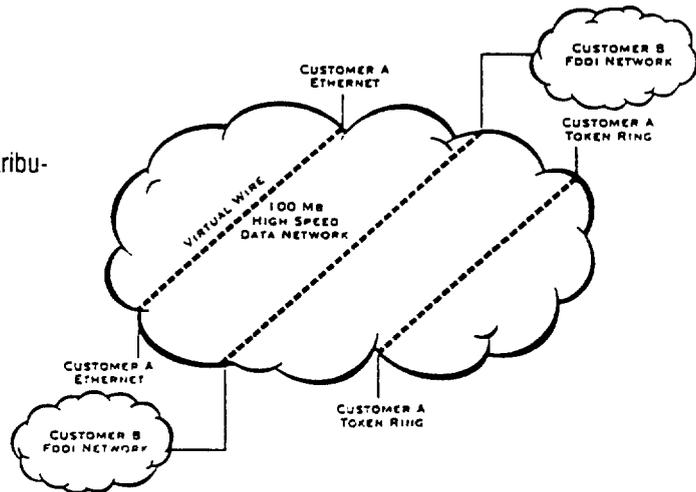
- 100% Digital Fiber Optics
- Point-to-Point or Multi-Point Service (Point-to-Point only for Computer Channel Extension)
- Self-healing, Counter-rotating Backbone Architecture
- Internetwork Protocol Encapsulation for data security on the FDDI ring
- Back-up Electronics and Power Available
- Two Totally Diverse Fiber Optic Routes
- Private Cabling System for internal building distribution provided

## PERFORMANCE CHARACTERISTICS

- 1.5 hour Restoration Interval
- 24-hour Network Surveillance Monitoring

## SERVICE APPLICATIONS

- Medical, Scientific, Architectural Imaging
- Concurrent Engineering
- Remote Back-up and File Access
- Electronic Mail
- Video Conferencing
- Document Processing/Imaging
- Computer Aided Design
- Computational Processing
- Remote Document Printing
- Data Center Consolidation
- Data Center Disaster Recovery
- Access to long distance carrier Frame Relay Services



**METROFIBER ANALOG**

**PRODUCT PROFILE**

MetroFiber Analog service will enhance 2-wire and 4-wire voice or analog data applications by providing a single channel transmission path between a customer and a long distance carrier or between two customer locations on the MFS network (where permitted). This service is compatible with either 2-wire ground and loop start equipment or 4-wire E/M signalling equipment. The 4-wire service supports analog data transmission speeds of up to 19.2 Kbps.

**SERVICE CHARACTERISTICS**

- 100% Digital Fiber Optics
- Point-to-Point Service or as channel end link on a DS-1 hub
- Automatically Activated Back-Up Electronics and Power
- Two Totally Diverse Fiber Optic Routes between each network location
- Private Cabling System for internal building distribution

**PERFORMANCE CHARACTERISTICS**

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring
- Exceeds Bellcore Service Standards

**PRODUCT APPLICATIONS**

- Automatic Ringdown
- Tie Line
- Foreign Exchange
- Off-Premise Extension (OPX)
- Dedicated Access Line (DAL) for WATS
- Analog Data up to 19.2 Kbps

**METROFIBER C.O. LINK<sub>SM</sub> SERVICE**

*MFS Telecom's MetroFiber Interconnection Services are the first complete line of interconnection services to offer customers a choice for all their local access telecommunications service needs. MetroFiber C.O. Link service provides a link for customers on MFS Telecom networks to locations not directly on the network.*

**SERVICE PROFILE**

MetroFiber C.O. Link extends the benefits of MFS Telecom's all-fiber, dedicated line transmission service into the LEC networks and enables companies to design private networks with route and central office (C.O.) diversity and electronic redundancy. MFS Telecom can also manage customers' on-net and off-net special access and private line services, allowing a single point of contact and billing for all their dedicated access needs in the cities where MFS Telecom operates.

**SERVICE CHARACTERISTICS**

For service over MFS Telecom facilities, MFS Telecom provides:

- 100% Digital Fiber Optics
- Automatically Activated Backup Electronics and Power
- Two Totally Diverse Routes between each network location
- Private Cabling System for internal building distribution
- Single point of contact for all service and billing
- Network Management and Control

For service over LEC facilities, service characteristics will depend on the specific LEC standards and performance.

**PERFORMANCE CHARACTERISTICS**

For service over MFS Telecom facilities, MFS Telecom provides:

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring

For service over LEC facilities, performance characteristics will depend on specific LEC standards performance.

**PRODUCT APPLICATIONS**

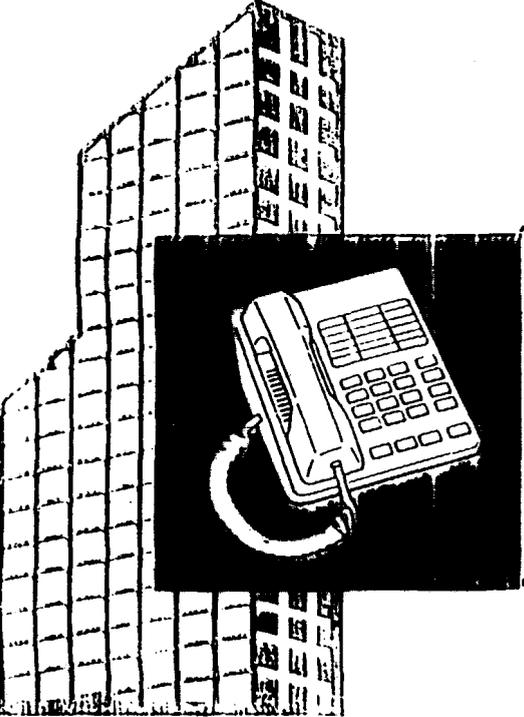
- Private Line dedicated T-1 long distance carrier service
- PBX and T-1 multiplexer connectivity
- Voice
- Analog Data
- Digital Data
- LAN Internetworking
- Frame Relay
- Video Conferencing
- Computer Channel Extension
- Local Loop for long distance carriers' fractional T-1 or T-1 standby services
- Traffic Aggregation for DS-0 and DS-1 end-link connections to DS-1 or DS-3 hub

**METROFIBER DS-1 C.O. LINK**



ACTIVE ROUTE

PROTECTION ROUTE



**MFS** TELECOM

**METROFIBER C.O.NNECTION<sup>SM</sup> SERVICE**

*Metropolitan Fiber Systems' (MFS) MetroFiber Interconnection Services is the first complete line of interconnection services to offer customers a choice for all their local access telecommunications service needs. MetroFiber C.O.nnection Service links customers on MFS networks to LEC central office (C.O.) switched services, such as centrex or Flexpath®. Service is currently available in cities where MFS has finalized interconnection agreements with local exchange companies, and will soon be available in all MFS cities nationwide.*

**SERVICE PROFILE**

MetroFiber C.O.nnection provides MFS' diversely routed, fully redundant fiber optic transmission services as an alternate for LEC transmission services to connect customers to LEC C.O. switched services. Transmission facilities may be analog, voice or data, digital data or DS-1.

**SERVICE CHARACTERISTICS**

For service over MFS facilities, MFS provides:

- 100% Digital Fiber Optics
- Automatically Activated Backup Electronics and Power
- Two Totally Diverse Routes between each network location
- Private Cabling System for internal building distribution
- Network Management and Control

For service over LEC facilities, service characteristics will depend on the specific LEC standards and performance.

**PERFORMANCE CHARACTERISTICS**

For service over MFS facilities, MFS provides:

- Reliabilities in excess of 99.99%
- 1.5 Hour Restoration Interval
- 24-Hour Network Surveillance Monitoring

For service over LEC facilities, performance characteristics will depend on the specific LEC standards and performance.

**PRODUCT APPLICATIONS**

- Transmission facility for LEC PBX direct outward and inward dialing services
- Transmission facility for centrex trunks that connect to centrex central offices or to long distance carrier WATS and private-line services
- Transmission facility for LEC Foreign Exchange (FX) and off-premise extension services