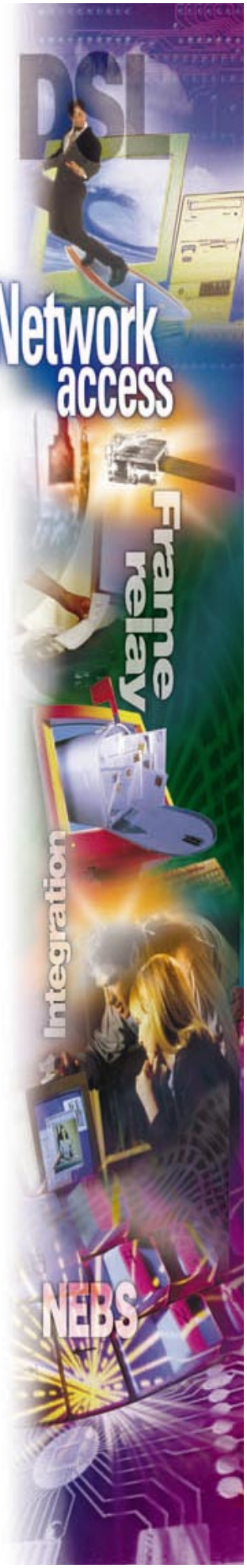
General DataComm
Network Access Division

Metroplex® 6000/T1

Global T1 Access Multiplexer

Highlights:

- ***Up to two T1 interfaces using the latest wideband technology***
- ***Modular, scalable architecture reduces equipment investment and field repair time***
- ***Supports a variety of both voice and data channel interfaces on one platform***
- ***Provides VT-100 craft port control plus Telnet or SNMP management***



Overview General DataComm's Metroplex® 6000/T1 is a next generation, intelligent access multiplexer designed for highly cost-effective and efficient termination of both T1 and High bit rate Digital Subscriber Line or HDSL. The Metroplex 6000 replaces older wideband multiplexing technology with a compact, high channel density system that organizes branch office 56/64 Kbps and fractional wideband data traffic along with FXS, FXO, E&M and PLAR voice. It provides standards-based access to wideband services, multiplexing data and/or voice channels onto one or two wideband lines.

Data and voice traffic can be integrated at the branch office level and valuable T1 bandwidth can be shared by combining data with PBX applications via a true "drop-and-insert" capability. You gain increased control of services that once resided inside the carrier "cloud," while achieving the right level of supervision —from management via a craft port interface or Telnet to sophisticated open management choices via GDC's TEAM™ 6000 HP OpenView-based, SNMP management application.

Effective Service Provisioning Metroplex 6000 helps service providers, distributors and resellers to introduce a host of CPE (Customer Premises Equipment) products that provision data and voice on one platform. With Metroplex 6000, migration to a premises-based solution — where the familiar wiring closet serves as the access point to public wideband services — allows savings on loop maintenance, central office space and equipment. The Metroplex 6000 can also be combined with the UAS (Universal Access System) 7000 Series as part of GDC's total multiservice provisioning strategy for deriving maximum bandwidth from existing copper loops.

Diverse Applications Some of the Metroplex 6000's extensive range of applications include:

- Single-ended public network access multiplexing at the branch office level for corporate environments
- Service provider termination of voice and data using T1 at the customer premises (Figure 1)
- Point-to-point T1 multiplexing over private facilities with the added benefit of consolidated voice and data.

You are a candidate for Metroplex 6000 flexibility and savings if you are: a public or private enterprise searching for ways to reduce network access costs for remote offices; a reseller who wants an entry

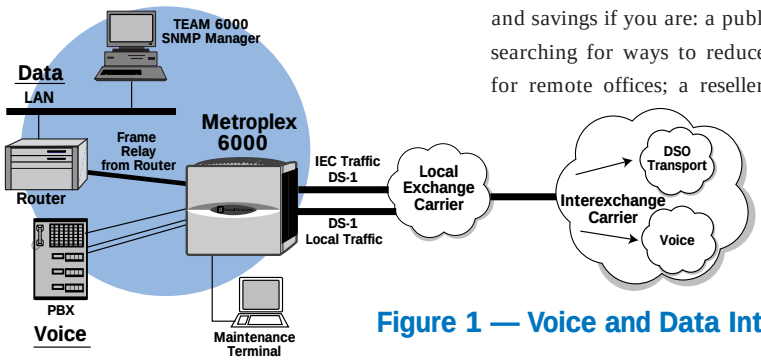


Figure 1 — Voice and Data Integration

Metroplex® 6000/T1

vehicle into the growing CPE T1 access market; a service provider looking for the most cost-effective way to deliver services in shared tenant facilities; or a utility that must get the most out of the facilities along its own rights-of-way.

Modular Design Metroplex 6000's modularized architecture provides scalable solutions for the branch office as well as central site locations. With its Metropak wallmount and Universal Systems Shelf rackmount, Metroplex fits into virtually any standards-based T1 application. System components include the Platform Basecard, and a versatile mix of data and voice Basecards housed in either a Metropak or a 19-inch rackmounted Universal System Shelf (USS).

Metropak is a wallmount enclosure that allows for easy installation and access. One Platform Basecard and up to five channel basecards can be housed in the Metropak, enabling a variety of data/voice configurations. The Metropak features a universal AC power supply plus an optional, external AC power supply for redundancy. Up to two 6-slot Metropak configurations can also be rackmounted using an optional rackmount kit, enabling installation in standard 483 mm (19-in.) or 584 mm (23-in.) wide cabinets. Rackmounting six-slot Metropaks using this method also allows powering from –48 VDC or +24 VDC supplies as well as AC sources.

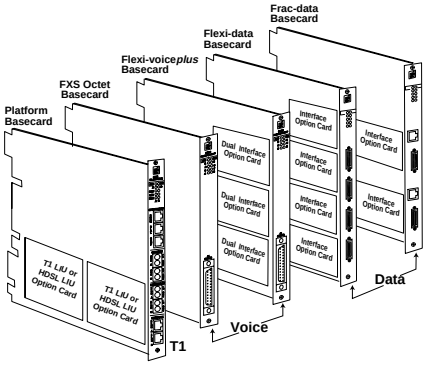


Figure 2 — Metroplex Basecards

For higher density applications, AC or DC versions of the USS equipped with Metroplex 6000 backplanes can house up to four Metroplex 6000 systems, each with one Platform Basecard and three voice and/or data Basecards. If two backplanes are linked together, shelf capacity is two eight-slot systems each with one Platform Basecard and up to seven data or voice cards. The result is high aggregate and channel capacity. In a typical fractional T1 configuration, for example, one USS supports up to twenty-four, 512 Kbps channels feeding into up to eight T1 circuits for a total aggregate capacity of 12.288 Mbps.

Unified System Architecture All basecards follow a standard GDC form factor, which means there is only one card style and outline for all enclosures. The Flexi-data and Flexi-voice*plus* Basecards accept various plug-in option cards that provide a selection of channel interfaces. Network, business equipment, and diagnostic interfaces appear on the basecard front panels, making for convenient cabling and installation. Standard connectors (50-pin for voice and OCU-DP data, 8-pin modular line, and EIA/TIA-232-E Alt A for DTE) are used throughout for easy plug-in re-arrangement.

DSU-DP Data Capabilities The Flexi-data Basecard, combined with the appropriate option cards, supports EIA/TIA-232-E, V.35, EIA-530, and V.36 interfaces and synchronous data rates of 2.4, 4.8, 9.6, 19.2, 56 or 64 Kbps. An asynchronous capability is also available for all subrates. These data channels are fully compatible with DDS and Generic Data Services (GDS), responding to all network loopback codes. Each Flexi-data Basecard can support up to four data interfaces. The Frac-data Basecard handles up to two "super-rate" channels per card at N x 56/64 Kbps rates up to the full 1.536 Mbps payload. It also has a DSX-1 "cascade" interface.

Flexible Voice Interfaces The Metroplex 6000 is ideal for widely used foreign exchange station (FXS) and foreign exchange office (FXO) voice, providing local telephone service from a central office foreign to the subscriber's exchange area.

FX trunk signaling via wideband links requires an access multiplexer configured with FXO and FXS connections. The Metroplex 6000 provides for this via a Flexi-voice*plus* Basecard equipped with the appropriate dual voice interface option cards — an OB (Originate Battery) card supporting FXS and a TB (Terminate Battery) card supporting FXO.

A 4-wire E&M Dual Interface Option Card supports E&M signaling, the most common interface signaling method for interconnecting PBXs with transmission signaling systems. Each Flexi-voice*plus* Basecard can handle up to three dual voice interface cards for a total mixed voice channel capacity of 30 in the Metropak and 84 in the USS.

Higher voice channel density is delivered by the FXS Octet Basecard. Instead of

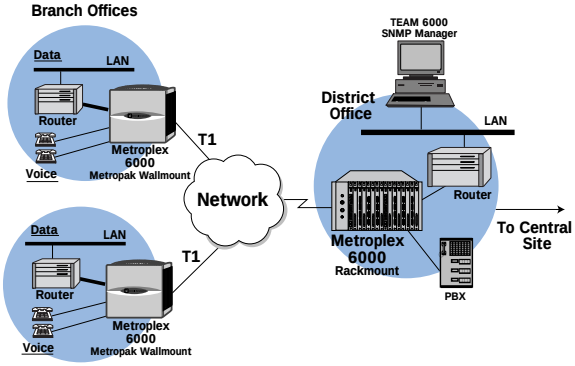


Figure 3 — Metropak and USS Rackmount

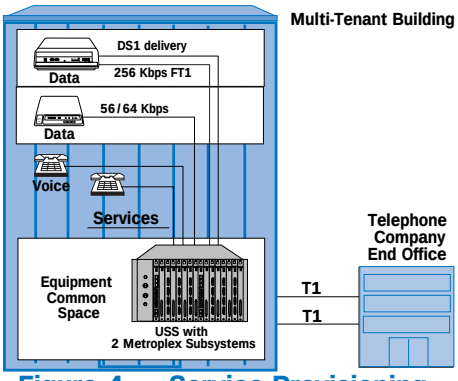


Figure 4 — Service Provisioning, Multi-Tenant Building

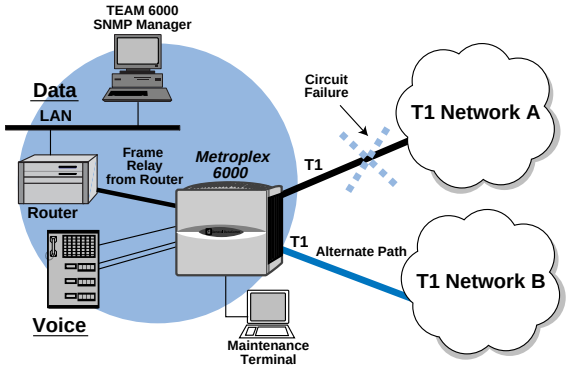


Figure 5 — Diverse Traffic Routing

interfaces via piggyback option cards, the FXS Octet has eight FXS voice interfaces built right into the card. The result is support for up to 40 FXS voice channels in the Metropak and up to 96 voice channels in USS configurations.

Voice Plus Data The Flexi-voice*plus* Basecard also supports a Dual 4-Wire TO (Transport Only) option card that handles voice circuits typically used to deliver private line modem data to remote locations. Another plus, a Dual OCU-DP (Office Channel Unit-Data Port) option card, is designed for distribution of DDS and/or GDS data at rates up to 64 Kbps to a DSU located within the same facility, but at an extended distance from the Metroplex 6000. As a result the same Flexi-voice*plus* Basecard can be used to transport analog modem data, OCU-DP-type data, as well as voice.

Aggregate Capabilities On the network side, the Metroplex 6000 Platform Basecard enables flexible interfaces to T1 and new digital subscriber line (DSL) wideband services. Each Platform Basecard has room for one or two T1 CSU LIU option cards, enabling delivery of up to two T1s per Basecard for added network access, drop-and-insert, or diverse routing. Offering complete T1 network compatibility, the T1 CSU LIU supports all CSU functions, including D4 and ESF framing (Tech Ref 54016 and ANSI T1.403), AMI and B8ZS line coding, ESF performance monitoring, and both network administrator and carrier-initiated diagnostic testing and alarms. In applications where wideband signals must be cascaded to DS1 equipment, a second LIU provides for drop-and insert capabilities.

The Platform Basecard can also be configured with one or two HDSL LIUs supporting the 2B1Q line code per Bellcore TA-NWT-001210. Located on the customer premises, the Metroplex 6000 with an HDSL interface serves as a single termination point for high-bandwidth delivery over existing copper loops. It can also interface with a UAS at the LEC central office, providing a complete system for grooming, distribution and termination of DSL services.

The flexibility of the Metroplex 6000's dual wideband circuit design facilitates diverse routing through two different access lines and/or two separate service providers. Power supply redundancy is also available. The net result is a more secure and extremely effective operating environment.

Diagnostics and Alarms The Metroplex 6000 supports a full array of carrier initiated loopbacks (T1 D4 and ESF latching line loopbacks, ESF payload, and OCU-DP) as well as line tests initiated from the management console (local loopback, digital milliwatt test tone, 511 and 2047 BERT). Front panel LED indicators on each basecard provide key functions for monitoring network and channel interfaces. Using the Sentry-Alert feature, a GDC exclusive, remote units can also be set to automatically dial host locations under operator specified alarm conditions.

Traditional, Telnet or SNMP Management A diagnostic interface on the Platform Basecard allows for traditional local craft port supervision via a VT-100 terminal interface (or any PC running a terminal emulation program) and simple, menu driven ASCII screens familiar to many operators. The Metroplex 6000 can also be optionally equipped for Telnet management using the DIAL interface, a PPP link into the 6000's SNMP port, or directly over an Ethernet via the SNMP interface. And finally, the Metroplex 6000 architecture has been designed to

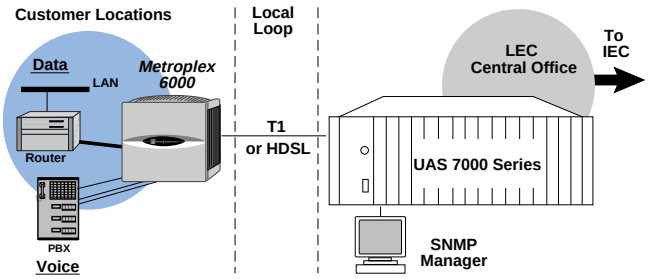


Figure 6 — Metroplex and the UAS 7000

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provide for centralized standards-based, network management. The SNMP port will accept communications using either Ethernet or PPP from any SNMP manager, or from GDC's TEAM 6000, an HP OpenView-based management application with an intuitive custom graphical user interface.

Specifications

Network Interfaces
Platform Basecard

Aggregate Capacity
Up to two T1s, each at 1.544 Mbps

Aggregate Interfaces
Integral T1 CSU, DSX-1, T1 HDSL

Framing
D4/ESF (Tech Ref. 54016 or ANSI T1.403)

Channel Interfaces

	Channels	Interface Types
Flexi-voice*plus* Basecard:	Up to 6 per card	FXS, FXO; 4-wire E&M; 4-wire OCU-DP, or 4-wire TO (Transport Only), via dual interface cards
FXS Octet Basecard:	Up to 8 per card	FXS only; no interface cards required
Flexi-data Basecard:	Up to 4 per card	2.4, 4.8, 9.6, 19.2 Kbps data, sync/async, EIA/TIA-232-E 2.4, 4.8, 9.6, 19.2, 56, 64 Kbps data; sync, V.35, EIA-530, V.36
Frac-data Basecard:	Up to 2 per card	N x 56/64 Kbps "Super-rate" channels from 56 to 1.536 Mbps; DSX-1 "cascade" interface, V.35, EIA-530

Maximum Channel Capacity

	Metropak	USS
Mixed Voice:	5 Flexi-voice*plus* Basecards for a total of 30 voice channels with any mix of interface types	14 Flexi-voiceplus Basecards for a total of up to 84 voice channels
OCU-DP Type Data:	5 Flexi-voice*plus* Basecards with OCU-DP option cards for a total of 30 data channels	N/A
FXS Only:	5 FXS Octet Basecards for a total of 40 FXS voice channels	12 FXS Octet Basecards for a total of 96 FXS voice channels
Data (9.6, 56, 64 Kbps):	5 Flexi-data Basecards for a total of 20 data channels	14 Flexi-data Basecards for a total of 56 DSU-DP (Data Service Unit-Data Port) type channels
Super-rate Data: (N x 56/64 Kbps)	5 Frac-data Basecards for a total of 10 data channels	14 Frac-data Basecards for a total of 28 data channels

Diagnostics

Carrier Initiated:	T1 – D4 latching line loopback, ESF latching line loopback, ESF payload loopback OCU-DP – OCU, CSU and DSU latching and non-latching loopbacks Frac-data – PN127 loop up/down code
Management Console:	Local loopback; digital milliwatt test tone; 511 and 2047 BERT pattern
Management Interface:	VT-100 craft port, DIAL, and SNMP
SNMP Compatibility:	Compliant with Simple Network Management Protocol (SNMP), Version 1 agent RFC 1213 MIB II, RFC 1406 DS1 MIB, and MIB for Metroplex 6000 features

Physical / Environmental

	Metropak	USS
Dimensions: Height	362 mm (14.25 in.)	267 mm (10.5 in)
Width	356 mm (14 in.)	483 mm (19.0 in.)
Depth	190 mm (7.5 in.)	343 mm (13.5 in.) AC Ver. 305 mm (12 in.) DC Ver.
Operating Temperature:	0° to 50° C (32° to 122° F)	
Humidity:	Up to 95% relative humidity without condensation	

Electrical

	Metropak	USS
Power:	60 W maximum	160 W maximum
Voltages:	100 to 240 VAC; –48 and +24 VDC (using –48 and +24 VDC optional rackmount kit)	100 to 240 VAC; –48 and +24 VDC

Regulatory

Emissions:	Verified to comply with FCC Part 15, Subpart J (Class A requirements)
Safety Protection	UL listed (UL 1459), CSA certified (CSA C22.2 #225), TUV licensed (EN60950)
FCC Part 68 Registration:	CSU T1 and TB (FXO) voice channel
Industry Canada (DOC):	CS-03 compliant

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