GDC 086R600-000-04
Issue 4, July 1998

Installation and Operation

Metroplex™ 6000

General DataComm

Manual Revision History

Shown below is a chronological listing of revisions to this manual. The issue number, date, and synopsis of revised materials are included to provide the reader with a comprehensive manual history.

Note *In keeping with the policy of continuing development carried out by General DataComm Inc., the information in this manual is subject to revision without notice.*

Issue	Date	Description
1	June/97	First issue.
2	Aug/97	Updated format and added an optional on-line manual.
3	May ’98	Added Canadian Warnings and safety information
4	Jun ’98	Updated Canadian Warnings and Safety information

FCC Part 68 Compliance

Connection of data communications equipment to the public telephone network is regulated by FCC Rules and Regulations. This equipment complies with Part 68 of these regulations which require all of the following:

This device cannot be used on public coin service or party lines. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. The device has a label that along with other information, provides the FCC Registration number and the Ringer Equivalence Number (REN) if applicable. If requested, give this information to the telephone company.

If the device connects to the switched network, the REN must not exceed 5.0 on any one line. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local phone company.

For single or multi-line equipment that connects to the telephone network via a plug and jack, the plug and jack must comply with the FCC Part 68 rules. An FCC compliant telephone modular plug and telephone cord is provided with this equipment. This device is designed to be connected to the telephone network or premises wiring, using a compatible modular jack which is Part 68 compliant. See installation chapter for details.

If the unit causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, you will be notified as soon as possible and will be advised of your right to file a complaint with the FCC. The telephone company may change its communication facilities, equipment, operations and procedures where reasonably required for operation. If so, the telephone company will notify you in writing. You must notify the telephone company before disconnecting equipment from 1.544 Mbps digital service. All repairs or modifications to the equipment must be performed by General DataComm or listed authorized agent. Any other repair or modification by a user voids the FCC registration and the warranty.

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business other entity, or individual.

To connect the Metroplex 6000 to the public telephone network the customer is required to give the following information:

FCC Registration Number AG6USA-23902-DE-N

Ringer Equivalence : _ 0.8B

Registration Status	Port ID	SOC	FIC	USOC
Original	T1 CSU	6.0Y	04DU9-BN	RJ48C
			04DU9-BN	
			04DU9-BN	
			04DU9-BN	
Original	FXO	0.8B/9.0f	02lS2	RJ21X
			02GS2	
Modification	T1 CSU	6.0Y	04DU9-BN	RJ48C
			04DU9-BN	
			04DU9-BN	
			04DU9-BN	
Modification	Frac DSX-1	6.0N	04DU9-BN	Must be connected to registered CSU.
			04DU9-DN	
			04DU9-1KN	
			04DU9-1SN	

Safety Guidelines

Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Repairs must be performed by qualified service personnel only.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Use caution when installing telephone lines and never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component.

The equipment may contain static-sensitive devices that are easily damaged and proper handling and grounding is essential. Use ESD precautionary measures when installing parts or cards and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floorpads and workbench pads.

When handling components, or when setting switch options, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment*. Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

Industry Canada Notification

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Electromagnetic Compatibility

This Class A digital apparatus complies with Canadian ICES-003.

Avis D'industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la comformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

La Compatibilité d' Eléctro-magnetique

Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada..

Deutschland

Installations Anweisungen: Installieren Sie die Telefonleitungen nicht während eines Gewitters. Installieren Sie die Telefonleitungen nicht in einem feuchten Raum, auβer die Dose entspricht den Vorschriften für Feuchträume. Berühren Sie unisolierte Telefonleitungen oder Einrichtungen nicht, auβer diese sind vom Telefonnetz getrennt. Vorsicht bei der Installierung oder Änderung von Telefonleitungen. *Achtung:* Es gibt keine durch den Benutzer zu wartende Teile im Gerät. Wartung darf nur durch qualifiziertes Personal erfolgen.

Public Telecommunications Networks

The presence of this symbol indicates that this equipment is not intended to be connected to a public telecommunications network. The connection of such equipment to a public telecommunications network in a European Community Member State will be in violation of the national law implementing Directive 91/263/EEC on the approximation of the laws of the Member States concerning telecommunication terminal equipment, including the mutual recognition of their conformity

EC Declaration of Conformity

We: General DataComm Limited
Molly Millars Lane
Wokingham, Berkshire RG41 2QF, United Kingdom

On behalf of: General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities;

Electromagnetic Compatibility

EN55022: 1994
Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992
Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1995 A1 through A3
Low Voltage Directive relating to electrical equipment designed for use within certain voltage limits.

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P.O. Box 1299, Middlebury, Connecticut 06762-1299 U.S.A.

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VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment.

GDC's VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.

For more information regarding GDC's VITAL Network Services' service programs, training courses, or for assistance with your support requirements, contact GDC's VITAL Network Services at the address or phone number listed below, or visit our website at: http//www.vitalnetsvc.com

VITAL Network Services World Headquarters
6 Rubber Avenue
Naugatuck, Connecticut 06770 USA

North America:	1 800 243 1030
	1 888 248 4825
	1 203 729 2461
Training Information:	1 203 729 0271
French Speaking Canada:	1 800 361 2552
North America Fax:	1 203 723 5012
	1 203 729 7611

VITAL Network Services Regional Sales and Service Offices:

Europe, Middle East, Africa

VITAL Network Services
Molly Millars Close
Molly Millars Lane
Wokingham, Berkshire RG41 2QF UK

Telephone:	+44 1189 657200
Training:	+44 1189 657240
Fax:	+44 1189 657279

Central America, Latin America

VITAL Network Services
Periferico Sur 4225, Desp. 306
C.P. 14210, Mexico D.F., Mexico

Telephone:	+52 5 645 2238
Training:	+52 5 645 2238
Fax:	+52 5 645 5976

Asia Pacific

VITAL Network Services
501 Orchard Road 05-05
Wheelock Place, Singapore 238880

Telephone:	+65 735 2123
Training:	+65 735 2123
Fax:	+65 735 6889

International Calling Code (+)

When calling from outside the country of origin, use the appropriate International Calling Code where the + symbol is shown.

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to CISPR 22 which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. The user is cautioned that any changes or modifications not expressly approved by General DataComm void the user's authority to operate the equipment.

This equipment is to be installed only in restricted access areas (dedicated equipment rooms, equipment closets or the like) in accordance with articles 110-16, 110-17 and 110-18 of the National Electrical Code, ANSI/NFPA 70.

Warranty

General DataComm warrants that its equipment is free from defects in materials and workmanship. The warranty period is one year from the date of shipment. GDC's sole obligation under its warranty is limited to the repair or replacement of the defective equipment provided it is returned to GDC, transportation prepaid, within a reasonable period. This warranty will not extend to equipment subjected to accident, misuse, or alterations or repair not made by GDC or authorized by GDC in writing. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied, including but not limited to, warranties of merchantability and fitness for purpose.

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Quick Set-Up

Quick Set-Up

REFER TO MANUAL FOR DETAILS

1. Attach Wallplate to plywood surface.
2. Attach Wallmount Enclosure to Wallplate.
3. Connect grounding and power cord to rear of enclosure.
4. Check position of option switches and jumpers on the following cards.
   - Platform Card
   - 4-Wire E&M option card
   - TB Voice option card
5. Install piggyback option cards to basecards.
6. Install basecards into Wallmount Enclosure.
7. Install retaining plates on 50-pin cable hoods.
8. Plug cables into front panels.
9. Check and set configuration on all cards depending on network configuration.

Using This Manual Set

The manual set describe how to install and configure a General DataComm Metroplex™ 6000. They explain how to monitor and manage network devices. They are written for operators and installers, and assumes a working knowledge of data communications.

Each major Metroplex™ 6000 component has its own manual. You received a hard copy only for what you purchased (not all manuals may be present). Manual updates can be inserted easily into the binder.

Organization of Binder

The binder has six tabs:

- 1 - *System Description* introduces important concepts, and features of the Metroplex™ 6000.
- 2 - *Enclosures/Shelve*s describes the various enclosures and shelves.
- 3 - *Platform Cards* describes the Platform Cards.
- 4 -*Voice Cards* describes Voice Cards and voice cards with added features.
- 5 - *Data Cards* describes the Data Cards.
- 6 - *Management* describes local and network management.

Related Publications

A complete listing of Metroplex 6000 user manuals is provided below in *Table P-1*

Table P-1 GDC Metroplex 6000 Publications

Applicable Documents	
Publication Name	**Publication Number***
Installation and Operation Metroplex 6000 (Preface and System Description)	GDC 086R600-REV-IS
Installation and Operation Metroplex 6000 Wallmount Enclosure	GDC 086R601-REV-IS
Installation and Operation Metroplex 6000 Universal System Shelf for Metroplex	GDC 086R601-REV-IS
Installation and Operation Metroplex 6000 Platform Card	GDC 086R602-REV-IS
Installation and Operation Metroplex 6000 Flexi-Voice Plus	GDC 086R603-REV-IS
Installation and Operation Metroplex 6000 Flexi-Data	GDC 086R604-REV-IS
Installation and Operation Metroplex 6000 Local Management	GDC 086R605-REV-IS
Installation and Operation Metroplex 6000 Frac-Data	GDC 086R606-REV-IS
Installation and Operation Metroplex 6000 FXS Octet	GDC 086R607-REV-IS
Installation and Operation Metroplex 6000 TEAM 6000 for UNIX	GDC 086R608-VREV-IS

*For publication numbers, REV is the hardware manual revision (for example, -001, -002, etc.) VREF is the software revision (for example - V120 - *this would read, Version 1.2*) and corresponds to the most current revisions. IS (for example -02) the most current issue of the document. When ordering documentation, request the most current issue available.

Document Conventions

Level 1 paragraph headers introduce major topics.

Level 2 paragraph headers introduce subsections of major topics.

Level 3 paragraph headers introduce subsections of secondary topics.

```
This typewriter font shows output that is displayed on the screen.
```

This bold font shows specific input that you type at the keyboard.

This bold italicized font shows variable input that you type at the keyboard.

Safety Information

The DANGERS, WARNINGS and CAUTIONS that appear throughout this manual are not only preventative measures designed to uphold the safety of both the service engineer and operator, but also enhance equipment reliability.

The definitions and symbols for DANGER, WARNING and CAUTION comply with ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs, and ANSI Z535.4, Product Safety Signs and Labels, issued by the American National Standards Institute.

The following examples show the symbols and definitions of DANGER, WARNING, CAUTION, *Note* and *Important* as they are used in this manual.

Note *Indicates a note. It is something you should be particularly aware of; something not readily apparent. A note is typically used as a suggestion.*

Important *Indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent. Important is typically used to prevent equipment damage.*

CAUTION *Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury. It may also be used to alert against unsafe practices.*

WARNING *Warning indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.*

DANGER *Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

Glossary

A-Law

PCM encoding format for voice signals, used with E1 (Refer to Mu-Law).

CO

Central Office

DDS

Digital data service: private-line digital service offered intra-LATA by BOCs, inter-LATA by AT&T Communications, with data rates typically at 2.4, 4.8, 9.6, and 56 kbps.

DPT

Dial Pulse Terminate.

DS0

Digital signal 0, a 64 kbps channel

DS0A

The standard rate adaption method used with DDS to allow subrate data (2.4, 4.8, 9.6, 19.2, 56 kbps) to be transported in a 64 kbps timeslot.

DSX-1

Interface standard for 1.544 Mbps Digital Service 1 equipment (cross-connect) used throughout North America and other countries.

E1

International 2.048 Mbps counterpart to North American T1 standard.

E&M

Ear and Mouth signaling leads for voice channels.

EMC

ElectroMagnetic Compatibility.

ESF

Extended Superframe Format. A T1 frame format which provides for Facility Data Link (FDL) for performance monitoring and error detection.

ESS

Electronic Switching System. (Central Office)

FEBE

Far End Block Error

FXO

Foreign Exchange, Office. A voice channel interface that detects ringing voltage and open or closes the loop. Typically, connects to a C.O. line or a PBX extension line.

FXS

Foreign Exchange, Subscriber. A voice channel interface that generates both battery and ringing voltage. Typically, connects to a telephone set or a PBX trunk.HDSL

High-bit-rate Digital Subscriber Line. A technology that allows transmission of fractional T1 rates over telephone lines without the use of repeaters.

IXC

Inter Exchange Carrier.

LEC

Local Exchange Carrier.

LIU

Line Interface Unit. A GDC term for the card that interfaces to the aggregate line (T1, HDSL, etc.) Metroplex 6000 can support two lines.

Mu-Law

PCM encoding format for voice signals, used with T1 (Refer to A-Law)

NEBE

Near End Block Error

OB

Originate battery. A term for a voice channel card that provides talk battery and ringing voltage. It can be configured to provide FXS or other similar interfaces.

PBX

Private Branch Exchange

PCM

Pulse Code Modulation. This is how analog voice band signals are digitized, using either A-Law or Mu-Law encoding. It provides a 64 kbps digital signal which is transmitted in one timeslot of a T1 or E1 signal.

PLAR

Private Line Automatic Ringdown.

PSN

Public Switched Network.

PSTN

Public Switched Telephone Network.

SF

Superframe format. Sometimes called D4. The original T1 frame format.

SNMP

Simple Network Management Protocol

T1

1.544 Mbps digital transport over metallic wires. Now, frequently used to mean DS1.

TB

Terminate Battery. A term for a voice channel card that provides loop closure and detects ringing voltage. It can be configured to provide FXO and similar interfaces.

TLP

Transmission Level Point. Used to set up the resulting analog levels in a PCM telephone network.

TPA

Trunk Processing Alarm

Contents

System Description

System Description

Overview

The Metroplex™ 6000 combines voice and data channels into one or two wideband digital lines. It can be used to access digital services from a customer premises.

Features

When properly equipped and configured the Metroplex™ 6000 system:

- Supports two wideband T1 access lines.
- Provides local configuration and monitoring through a VT-100 craft interface.
- Provides FXS voice channels.
- Provides FXO voice channels.
- Provides 4-wire E&M voice channels.
- Provides data channel card for 9.6, 56, and 64 kbps operation.
- May be mounted on a wall or in a rack.
- Provides all interface connections at the front of the cards. Other than the power cord, no rear access to the unit is required.

Description

The Metroplex™ 6000 multiplexes and de-multiplexes services on the customer premises. Domestically and in other countries where direct access to the digital network is available, it may be used as a “single-ended” device that de-multiplexes conventional voice and data services. As a standalone product, the unit handles T1, and future E1 network interfaces. For international environments, the Metroplex™ 6000 and the UAS 7000 work together so that telephone company services may be provisioned across the subscriber loop from the central office located UAS 7000. The Metroplex™ 6000 aggregate frame and channels (data and voice) use 64 kbps timeslot formats so that a channel multiplexed by the Metroplex™ 6000 can be de-multiplexed by any standards - based network equipment anywhere in the world.

Hardware

The Metroplex™ 6000 supports the network and channel functions through a set of cards that provide a variety of interfaces. In addition to the Platform/LIU (aggregate) Card, are a number of voice and data cards and optional piggyback cards. The basic system includes:

- 6-slot Wallmount Enclosure for wall or rack mounting and 4/8 slot USS (Universal System Shelf).
- Platform Card (one required per system) which contains one or two LIUs.
- Flexi-Voice Plus Card with piggyback interface cards.
- Flexi-Data Card with piggyback interface cards.
- Frac-Data Card with piggyback interface cards.
- FXS Octet Card with no interface cards.

Software

Software controlled features built into the Platform Card and individual voice and data cards allow you to set-up, monitor and control the Metroplex™ 6000. Utilizing easy to use menu driven screens, you can configure the Metroplex™ 6000 locally or remotely from a VT-100 or equivalent terminal.

Applications

Figure 1 shows a basic standalone multiplexer application, *Figure 2* shows a typical area network with terminal server and DS0 PSN trunks.

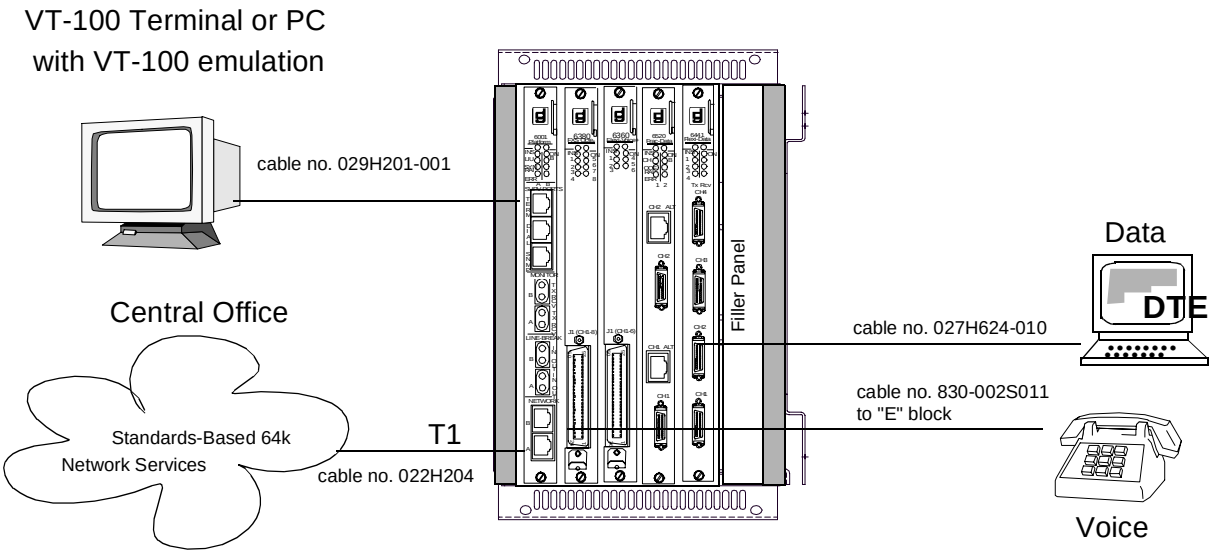

Figure 1 Metroplex™ 6000 as a Standalone Multiplexer

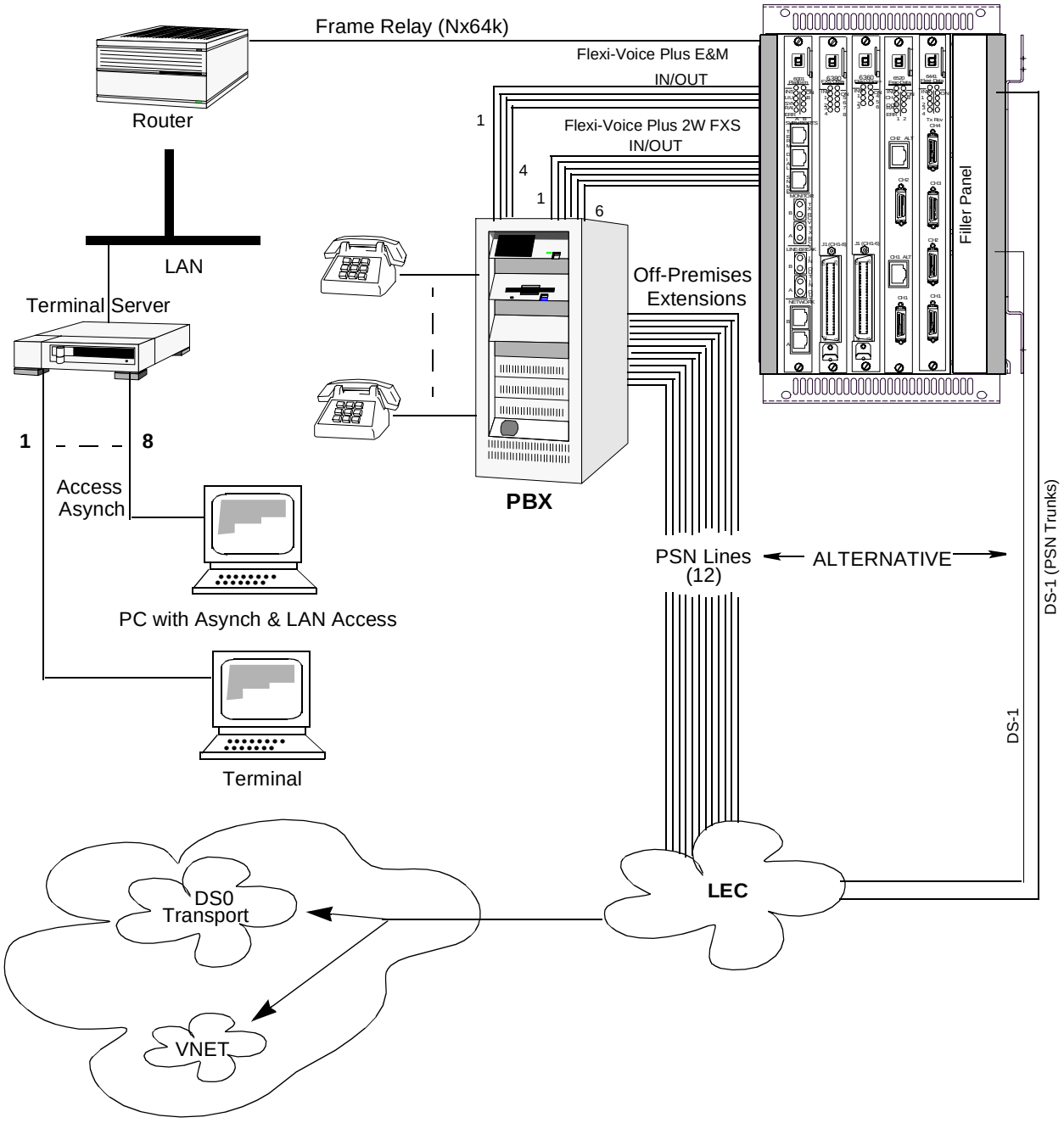

Figure 2 Typical Area Network

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