AG Communication Systems

A Subsidiary of

Lucent Technologies

Bell Labs Innovations

SuperLine™ Access System

SuperLine Access Shelf
Installation, Operations, and Maintenance
Release 3.0 (R3.0)

SD-100300-IOMP
363-225-105
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Notice

Every effort was made to ensure that the information in this information product (IP) was complete and accurate at the time of printing. However, information is subject to change.

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Interference Information: Part 15 of FCC Rules

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limited are designed to provide reasonable protection against harmful interference with the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Ordering Information

The AG Communication Systems order number for this IP is SD-100300-IOMP.

The Lucent Technologies order number for this IP is 363-225-105.

Support Telephone Numbers

Information Product Support Number

Refer to **How to comment** in the About this information product section of this IP.

Technical Support Telephone Number

Refer to **Technical support** in the About this information product section of this IP.

Contents

About this information product

Purpose

The AG Communication Systems *SuperLine™ Access System SuperLine Access Shelf Installation, Operations, and Maintenance* guide describes how to install, configure, and operate *SuperLine* Access Shelf equipment at the central office (CO).

Reason for reissue

This issue of the *SuperLine Access System SuperLine Access Shelf Installation, Operations, and Maintenance* guide replaces Issue 2. Replace your Issue 2 with this document.

This document is reissued to reflect the following changes:

- The ***SuperLine* Access System cables** parts list in the Hardware description chapter has been updated.
- The figure **Shelf and SPFM ground connections** in the topic Grounding shelf equipment in a local digital switch frame lineup in the Installation chapter has been modified to show the correct position of the *SuperLine* POTS Filter Module.
- The figure **Rear shelf and SPFM connections** in the topic Cabling the SPFM to the shelf in the Installation chapter has been modified to show the correct position of the *SuperLine* POTS Filter Module in relation to the shelf.
- The figure **SPFM front connections** in the topic Cabling the SPFM to CO Equipment and External Facilities terminal blocks in the Installation chapter has been modified to show new cabling layout.
- The procedure **Installing and cabling VDS1 and FETH cards** has been modified to include information on installing shielded cables.

- *GTD-5*® EAX installers must set a Digital Pad Value for derived line calls in the topics **Testing CO baseband voice and derived lines at the local digital switch** and **Cutting over subscriber baseband voice and derived lines at the local digital switch**, both in the Installation chapter.
- The figure **Rear view of SPFM with connections to shelf** in Appendix B, SPFM rear panel pin assignments, has been modified to show the correct position of the SPFM in relation to the shelf.
- Appendix C, **DSO channel assignments for EM telephony configurations**, has been modified with changes to the figure and tables.

Intended audience

This document contains information and instructions for technicians, installers, and engineers who are responsible for the initial installation of *SuperLine* Access Shelf equipment, as well as its long-term administration.

CAUTION

Service degradation and equipment damage hazard

SuperLine Access Shelf equipment must only be installed by qualified personnel in accordance with instructions in this manual and related documentation. (Refer to the topic Related documentation in this chapter for a list.) Failure to properly install SuperLine Access Shelf equipment could result in degraded service to customers, damage to CO equipment, or both.

Systems supported

The information in this information product is valid for Release 3.0 (R3.0) of the *SuperLine* Access System.

Safety labels

Admonishments (DANGER, WARNING, and CAUTION statements) tell customers that the actions they are about to perform may harm them or the equipment. Following are the three types of admonishments in the order of priority.

DANGER
Electric shock

Danger indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.

WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result in serious bodily injury or damage to equipment.

CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate bodily injury or calls attention to operating or servicing instructions that must be followed in order to reduce the risk of damaging equipment or degrading service.

Safety precautions

CAUTION
Bodily injury and equipment damage hazard

Observe the following safety precautions to prevent electric shock or other physical injury and to reduce the risk of fire or damage to the SuperLine Access Shelf equipment.

- Read and understand all instructions before operating the equipment.
- Follow all warnings, cautions, and instructions marked on the product.
- Do not block or cover openings in this equipment or place this equipment in an enclosed area where ventilation is limited. Slots and openings in the equipment provide ventilation to protect circuits from overheating.
- Operate this product only from the type of power source indicated on the power supply.
- Never push foreign objects of any kind into this product through slots or openings. Foreign objects can touch dangerous voltage points or short-circuit parts that can result in fire or electric shock.
- Do not disassemble this product. It contains no user-serviceable parts other than the shelf's circuit packs. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the device is used.
- Be careful of the sharp edges on the face of the shelf cards.
- Do not use this product near water. Never spill liquid of any kind on this product.
- Disconnect power to the equipment and call the service provider for any of the following conditions:
  - Power supply wiring is damaged or frayed.
  - Equipment has been exposed to rain, water, or other liquids.
  - Equipment exhibits a distinct change in performance.
  - Equipment does not operate normally when you follow the operating instructions.
  - Equipment is damaged.

For installation-specific safety information, refer to the **Installation safety information** topic in the Installation chapter.

Electrostatic discharge (ESD)

Considerations to avoid ESD damage.

WARNING

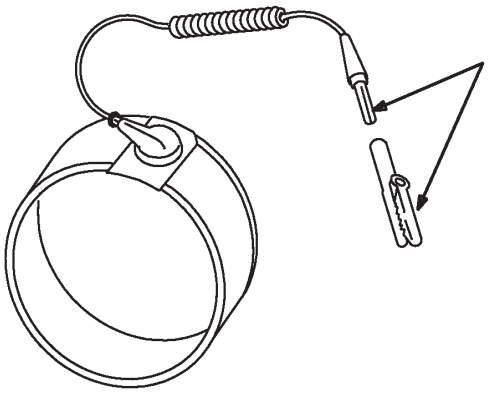
Electrostatic discharge damage hazard

Industry experience has shown that all integrated circuit packs can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static contact charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.

Observe the following list of precautions when handling circuit packs to prevent damage by electrostatic discharge.

- Assume all circuit packs contain solid state electronic components that can be damaged by ESD.
- When handling circuit packs (storing, inserting, removing, etc.) or when working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat. If a static-dissipating floor mat is used, be sure that it is clean to ensure a good discharge path.
- Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Observe warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic packaging until ready to insert them into slots.
- Open, if possible, all circuit packs at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats. If a static-dissipating table mat is used be sure that it is clean to ensure a good discharge path.
- Always store and transport circuit packs in static-safe packaging. Shielding is not required unless specified.
- Keep all static-generating materials such as food wrappers, plastics, and foam packaging away from all circuit packs. On removal from the bay, immediately put circuit packs into static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.

To reduce the possibility of ESD damage, shelves are equipped with grounding jacks to enable personnel to ground themselves using wrist straps with a minimum resistance of 250 k Ω while handling circuit packs or working on a shelf or shelves. An example is shown on the next page. Connect the wrist straps to the jacks. When grounding jacks are not available, use an alligator clip adapter to connect to the bay frame ground.



How to use this information product

In general, this document adheres to a structured writing format that helps you gain access to information easily and quickly. This topic describes the following conventions used in this document:

- Organizational aids
- Typographical conventions
- Safety alert symbols and messages
- Indexing figures, tables, and procedures

Terminology

Refer to the **Glossary** for the terminology used in this document.

Indexing figures, tables, and procedures

The locations of figures, tables, and procedures included in this manual appear in the **Index** under the entries Figures, Tables, and Procedures, respectively.

Organizational aids

The following organizational aids help organize information in this document.

Organizational Aid	Description
Left margin bold Helvetica, first letter capitalized	Identifies a topic, procedure, figure, or table. Facilitates quick scanning of information. Example: **Organizational aids**
□	Identifies the end of a topic or a chapter.

Conventions used

The following typographical conventions help you navigate through this document.

Convention	Description
Bold text	Represents a reference to a chapter, a topic within a chapter, a procedure, a menu option you must select, or a button you must select.
Bold text, underlined	Indicates a hyperlink to a specific topic, procedure, figure, table, etc.
Italicized text	Indicates the title of a published document.
`Non-bold Courier text`	Indicates command names, file names, or output.
`Bold Courier text`	Indicates text you enter, such as commands or responses to system output.
ALL CAPITAL LETTERS	Emphasizes the text.
Important:	Supplies useful information that can help users in setting up, operating, or servicing equipment.

Related documentation

Refer to the following documents for further information related to installing, maintaining, and troubleshooting *SuperLine* Access Shelf equipment.

Document Name	Identifier	Vendor
5ESS® User's Guide	Site- and System Version Release (SVR)-dependent	Lucent Technologies
Cabling Methods	Practice 256-224-216	AG Communication Systems
Carrier-to-Customer Installation—DS1 Metallic Interface	ANSI T1.403	American National Standards Institute
Digital Interface Between the SLC®96 Digital Loop Carrier System And A Local Digital Switch	TR-TSY-000008	Telcordia Technologies Inc. (formerly Bellcore)
Distributing Frame Terminal Block Diagram	Engineering Configuration Drawing (ECD)-17004-005	AG Communication Systems
DMS™ User's Guide	Site- and System Version Release (SVR)-dependent	Nortel Networks Corporation

Document Name	Identifier	Vendor
Electromagnetic Compatibility and Electrical Safety—Generic Criteria for Network Telecommunications Equipment	GR-1089-CORE	Telcordia Technologies Inc. (formerly Bellcore)
Equipment Power Distribution and Grounding	ECD-17005	AG Communication Systems
Erection Methods Mounting Unit Type Equipment	Practice 237-050-210	AG Communication Systems
Floor Plan Requirements Engineering and Planning Guidelines	Practice 780-224-071	AG Communication Systems
GTD-5® EAX User's Guide	Site- and System Version Release (SVR)-dependent	AG Communication Systems
Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface	TR-NWT-000303	Telcordia Technologies Inc. (formerly Bellcore)
Local and Metropolitan Area Networks—Type 10Base-T Medium Attachment Unit (MAU) Protocol Implementation Conformance Statement (PICS) Proforma	IEEE 802.3	Institute of Electrical and Electronic Engineers, Inc.
National Electrical Code	ANSI/NFPA 70	National Fire Protection Association
Network and Customer Installation Interfaces—Asymmetric Digital Subscriber Line (ADSL) Metallic Interface, Annex E, *POTS Splitter Requirements*	ANSI T1.413–1998	American National Standards Institute
Network Equipment Building System (NEBS) Requirements: Physical Protection	GR-63-CORE	Telcordia Technologies Inc. (formerly Bellcore)
Nortel NTMX81 User's Guide		Nortel Networks Corporation
Safety of Information Technology Equipment	UL 1950 and CAN/CSA-C22.2 No. 950–95, Third Edition	Underwriters Laboratories Inc.

Document Name	Identifier	Vendor
SuperLine Integrated Access Device Model 6512-A2 Installation Instructions	6512-A2-GN10-xx	Paradyne Corporation (Orderable from AG Communication Systems.)
SuperLine Access System Applications and Engineering, Release 3.0	SD-100300-SAEP	AG Communication Systems
SuperLine Access System Applications and Engineering, Release 3.0	363-225-101	Lucent Technologies
SuperLine Access System Element Manager User's Guide, Release 3.0 a.	SD-110300-EMUP	AG Communication Systems
SuperLine Access System Element Manager User's Guide, Release 3.0 a.	363-225-104	Lucent Technologies
SuperLine Access System SuperLine Access Shelf Installation, Operations, and Maintenance, Release 3.0	363-225-105	Lucent Technologies
SuperLine Access System Release Notes, Release 3.0	SD-100300-SRNP	AG Communication Systems
SuperLine Access System, Release Notes, Release 3	363-225-102	Lucent Technologies
SuperLine Access System Troubleshooting, Release 3.0	SD-100300-TSGP	AG Communication Systems
SuperLine Access System, Troubleshooting, Release 3.0	363-225-103	Lucent Technologies
SuperLine Integrated Access Device Model 6512-A2 Installation Instructions		Paradyne Corporation (Provided with each *SuperLine* IAD.)
Model 6035 Phone Filter Installation Instructions		Paradyne Corporation (Provided with each *SuperLine* IAD and included in the customer premises equipment filter package.)

a. Includes both *SuperLine* Element Manager and Multi-Element Manager.

Related training

The following training provides additional information about the *SuperLine* Access System. Contact the appropriate supplier, either AG Communication Systems or Lucent Technologies, as follows:

AG Communication Systems

For information on related training, contact your AG Communication Systems' sales representative.

Lucent Technologies

The National Product Training Center in Altemonte Springs, Florida, provides management courses for planning, engineering, and ordering as well as training for telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses may be available. Consult your Local Lucent Technologies Account Executive for more information or reservations. Enroll in a course using one of the following methods.

- 1-888-LUCENT8 (1-888-582-3688). Call the training coordinator for your company to get information on these and other training courses available, on schedules, fees, and registration. If your company does not have an assigned training coordinator, call this toll-free number [1-888-LUCENT8 (1-888-582-3688)] Monday through Friday, 7:30 a.m. to 5:30 p.m. EST. Use this number to order a product training catalog, get more information about a course, find out about new courses, or to register for a class. However, in Canada, please call 1-800-221-1647.

  When you call 1-888-LUCENT8, select Option 2 (press 2 one time on a touchtone phone) for Lucent Technologies product training.

- COMCATS. You may also use a computer and modem to log into the online catalog, computerized catalog system (COMCATS). Set your terminal options to the following values.
  - 300/1200/2400 baud rate
  - Full duplex
  - Space parity
  - 7 data bits
  - 1 stop bit

dial:	1-800-662-0662 or 614-764-5566
login:	comcats
password:	at&tcat

If you have trouble accessing COMCATS, call 1-888-LUCENT8 and ask to speak with the COMCATS Administrator.

Technical support

For technical support, contact the appropriate supplier, either AG Communication Systems or Lucent Technologies, as follows:

AG Communication Systems

AG Communication Systems provides customer assistance for the *SuperLine* Access System including, but not limited to, troubleshooting assistance, technical consultation, operational problem consultation, procedural advice, and emergency recovery assistance from a qualified system support professional.

If you have technical information questions, contact the Customer Support Center (CSC) by telephone at 1-888-888-AGCS (1-888-888-2427) or by electronic mail at superlinehelp@agcs.com.

If you need help with installing or operating *SuperLine* Element Manager or Multi-Element Manager, contact the Customer Support Center.

If you need help to resolve problems with *SuperLine* Integrated Access Devices (IADs), refer to the *SuperLine Access System Troubleshooting* guide or the *SuperLine Integrated Access Device Model 6512-A2 Installation Instructions* document provided by Paradyne Corporation, a partner in *SuperLine* development.

For more information about the *SuperLine* Access System, contact your AG Communication Systems technical sales staff or visit our Web site at www.agcs.com (from outside the United States: www.agcs.com.us).

Lucent Technologies Regional Technical Assistance Center (RTAC)

Lucent Technologies provides customer assistance for the *SuperLine* Access System including, but not limited to, troubleshooting assistance, technical consultation, operational problem consultation, procedural advice, and emergency recovery assistance from a qualified system support professional from the Regional Technical Assistance Center (RTAC).

- 1-800-225-RTAC (1-800-225-7822). Service is provided from the RTAC at 1-800-225-RTAC (1-800-225-7822). This telephone number is monitored 24 hours a day, 7 days a week. During regular business hours, your call will be answered by your local regional RTAC. Outside normal business hours, all calls will be answered at a centralized technical assistance center where service-affecting problems will be dispatched immediately to your local RTAC. All other problems will be referred to your local RTAC on the next regular business day.

How to comment

Contact the appropriate supplier, either AG Communication Systems or Lucent Technologies, as follows:

AG Communication Systems

To provide feedback or comments, send electronic mail to the Customer Support Center at superlinehelp@agcs.com or contact your sales representative.

Lucent Technologies

Please use one of the two feedback forms that are located immediately after the legal page of this document.

Missing feedback forms

If the feedback forms are missing, please send your comments and suggestions to the following location.

- Documentation Services Coordinator
  Lucent Technologies
  240 E. Central Parkway
  Altamonte Springs, FL 32701–9928

How to order

Contact the appropriate supplier, either AG Communication Systems or Lucent Technologies, as follows:

AG Communication Systems

To order copies of documents, send or call in an order.

Mail Order	**Telephone Order (Monday through Friday)**
AG Communication Systems ATTN: Order Fulfillment P.O. Box 52179 Phoenix, AZ 85027	Within USA: 1-623-581-4263 7:30 a.m. to 4:00 p.m. MST FAX: 1-623-582-7840

For more information

For information about other *SuperLine* Access System products, contact your AG Communication Systems technical sales staff or visit our Web site at www.agcs.com (from outside the United States: www.agcs.com.us).

Lucent Technologies

To order copies of documents and/or to request placement on the standing order list, send or call in an order.

Customer	**Mail Order**	**Telephone Order (Monday through Friday)**
Commercial Customers a.	Lucent Technologies Customer Information Center ATTN: Order Entry Center 2855 N. Franklin Road P.O. Box 19901 Indianapolis, IN 46219	Within USA: 1-888-LUCENT8 or 1-888-582-3688 7:30 a.m. to 6:30 p.m. EST From Canada: 1-800-255-1242 Worldwide: 1-317-322-6416 FAX: 1-317-322-6699
RBOC/BOC	Process through your Company documentation coordinator.	
a. For commercial customers, a check, money order, purchase order number, or charge card number is required with all orders. Make checks payable to Lucent Technologies. Lucent Technologies entities should use Form IND 1-80.80 FA, which is available through the Customer Information Center.		

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1 System description

Overview

Introduction This chapter provides a high-level description of AG Communication Systems *SuperLine*™ Access System technology, equipment, and architecture. Additionally, it describes *SuperLine* Access System telephony compatibility and capabilities and concludes with a description of system alarms.

In this chapter This chapter covers the following topics:

□

Introduction to the *SuperLine* Access System

SuperLine Access System technology

Using the existing subscriber loop for baseband voice phones, *SuperLine* Access System technology offers small-office, home-office, and residential subscribers up to two new digital voice lines (*derived lines*), Ethernet data services, or both. These new services are in addition to a subscriber's existing baseband POTS (Plain Old Telephone Service) service. To accomplish this, service subscribers install the *SuperLine* Integrated Access Device at their premises, while telephone service providers install one or more *SuperLine* Access Shelves at their central office (CO).

SuperLine Access System features and benefits

SuperLine Access System technology is made possible by multiplexing telephony lines over standard POTS voice lines. Telephone customers and telephone service providers can benefit from *SuperLine* Access System technology as summarized in the list below.

- The *SuperLine* Access System allows telcos to generate additional revenue and margins using existing single copper pairs, eliminating extra outside plant construction, installation truck rolls, and visits by service technicians to subscribers' homes and offices to activate *SuperLine* Access System service or perform on-premises wiring.
- The *SuperLine* Access System turns a two-wire single-party loop start phone line into three phone lines, each with a unique directory number (DN).
- The *SuperLine* Access System provides 10/100Base-T Ethernet connection aimed mainly at Internet service provider (ISP) customers.
- The *SuperLine* Access System is spectrally compatible with existing digital services, such as Integrated Services Digital Network (ISDN), so the impact of introducing the *SuperLine* Access System into the telco network is minimal.
- *SuperLine* Access System is compatible with baseband services.
- The *SuperLine* Access System supports CLASS (Custom Local Area Signaling Services) and Centrex services on all voice lines if they are available from the switch: caller ID, call waiting, call forwarding, distinctive ring, fax, modem, voice mail, calling number block, etc.
- The *SuperLine* Access System supports standard Dual Tone Multifrequency (DTMF or touchtone) phones.
- *SuperLine* Access System derived lines deliver V.90 modem speeds to meet the rapidly growing demand for Internet access and telecommuting applications.

SuperLine Access System telephony compatibility

The *SuperLine* Access System is compatible with the following types of telephony protocols used in switching equipment:

Telephony Type	Switching Equipment		
	***GTD-5*® EAX**	***5ESS*®**	***DMS*™**
Direct Digital Interface (DDI)	✓		
TR-303	✓	✓	✓
TR-008 Mode 1		✓	✓

SuperLine Access System equipment

The *SuperLine* Access System consists of the following hardware devices:

- *SuperLine Access Shelf.* The shelf is used as a concentrator to connect a maximum of 96 baseband voice lines, 192 *SuperLine* derived phone lines, and 96 Ethernet data channels. Derived voice availability is dependent on shelf provisioning.
- *SuperLine POTS Filter Module (SPFM).* The SPFM is the interface between the CO switch and the baseband voice lines connected to the *SuperLine* Access Shelf and the External Facilities lines.
- *SuperLine Integrated Access Device (IAD).* The *SuperLine* Integrated Access Device is a voice/data device that subscribers plug into a conventional power outlet and any active RJ-11 phone jack in their homes or offices. The *SuperLine* IAD allows subscribers to have up to two derived phone lines and a 10Base-T Ethernet data connection, in addition to their existing baseband telephone connection, all using the same customer premises copper twisted-pair wiring that terminates at the *SuperLine* Access Shelf. Subscribers can make and receive calls on both *SuperLine* derived lines while simultaneously making or receiving baseband phone calls, using Ethernet data services, or both depending on loop characteristics.

SuperLine Element Manager

SuperLine Element Manager (EM) software uses Simple Network Management Protocol (SNMP) to configure and manage the *SuperLine* Access Shelf equipment, as well as to download new versions of *SuperLine* software. AG Communication Systems provides the EM software on a CD-ROM.

SuperLine Element Manager screens are accessed by activating the EM software on the PC or workstation that is used to interface with the *SuperLine* Access System equipment. The graphical user interface (GUI) supports configuration management, fault management, and system management functions associated with managing the shelf.

Sold separately as an enhancement to *SuperLine* Access Systems, Multi–EM is a version of *SuperLine* Element Manager that runs under Hewlett-Packard *OpenView*™ Network Node Manager (NNM); it allows *OpenView* NNM to monitor and manage *SuperLine* Access Shelves as network nodes.

More *SuperLine* Access System information

For information on ...	**refer to ...**
SuperLine Access System and its functionality	*SuperLine Access System Applications and Engineering*
SuperLine Element Manager and Multi-Element Manager	*SuperLine Access System Element Manager User's Guide*
SuperLine Access System operating issues	*SuperLine Access System Release Notes*
SuperLine Integrated Access Device	*SuperLine Integrated Access Device Model 6512-A2 Installation Instructions*

□

Network architecture

SuperLine Access Shelf features

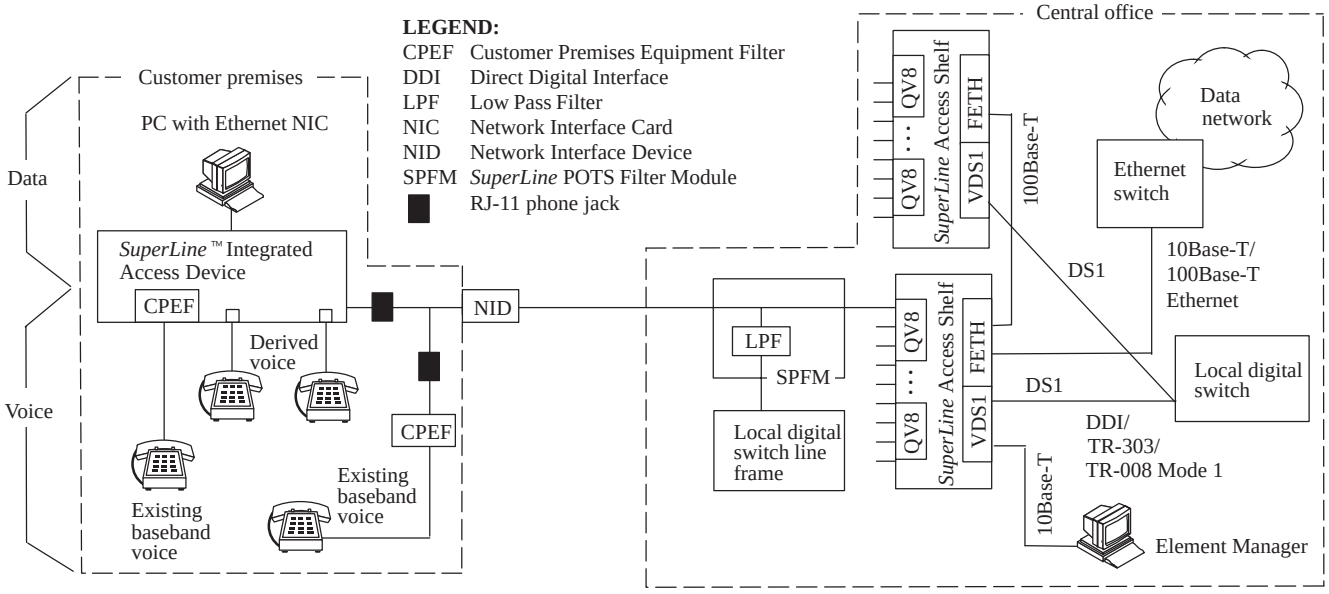
SuperLine Access Shelves can be installed in a central office environment, as shown in the accompanying **Network architecture** figure, or in a remote cabinet. Up to five *SuperLine* Access Shelves and five *SuperLine* POTS Filter Modules can be packaged per 8-foot rack frame.

The *SuperLine* Access Shelf provides the following features:

- Up to 12 Quadrature Amplitude Modulation Voice 8 (QV8) line cards per shelf
- One voice processor card (VDS1), one data processor card (FETH), and one power card (POWR) per shelf
- Eight customer circuits per QV8 card
- Four DS1s for DDI, TR-303, or TR-008 Mode 1 interface per voice processor card
- A 10Base-T craft interface on the data processor card
- Fast Ethernet service through two 10/100Base-T connections on the data processor card
- SPFM for connecting existing baseband voice lines from the CO Equipment to the shelf and subscriber loop
- Ability to monitor shelf and telco alarms

Network architecture

The following figure illustrates a typical CO application of the *SuperLine* Access System and provides an overview of the system and its interconnecting system elements, including the *SuperLine* Integrated Access Device at the customer premises and the *SuperLine* Element Manager at the CO.



SuperLine is a trademark of AG Communication Systems.

When connecting one or more PCs to the *SuperLine* Integrated Access Device at the customer premises, observe the following:

- Use a crossover cable to connect one PC to the the *SuperLine* IAD.
- Use a hub for connecting multiple PCs to the the *SuperLine* IAD.
- Use a straight-through Ethernet cable to connect the hub to the *SuperLine* IAD.

Shelf line card: QV8

The QV8 is the line card in the *SuperLine* Access Shelf. A maximum of 12 QV8 cards can be installed in one shelf. QV8 cards are the only shelf cards that are hot swappable; that is, they can be installed or removed without powering down the shelf or disrupting service on other shelf cards.

Each QV8 card provides the following features and functions for the *SuperLine* Access Shelf:

- Multiplexes up to 8 physical lines and up to 8 Ethernet data services, representing up to 16 derived voice lines.
- Provides dynamic software downloading.
- Interfaces with and routes Ethernet frames to the Fast Ethernet (FETH) card over the 10Base-T bus.

Shelf voice card: VDS1

The Voice DS1 (VDS1) is the voice processor card for the *SuperLine* Access Shelf. One VDS1 card resides in each shelf and provides the following features and functions for the shelf:

- Timeslot Interchange (TSI) and DS1 physical interface for the shelf.
- Network Timing Reference (NTR) for distribution to QV8 cards.
- The host administrative and Central Processing Unit (CPU) for the shelf.
- Control point for collecting and reporting data, such as alarm reporting and provisioning and processing data, to the *SuperLine* Element Manager used to manage the shelf.
- Administrative entry point for the shelf. Provides external management system interface, system software loading, and database administration.

The VDS1 card is NOT hot swappable. The shelf must be de-energized before a VDS1 card may be added to or removed from the shelf. Refer to the chapter **Adding and replacing shelf equipment** for instructions.

Shelf data card: FETH

The FETH card is the Ethernet data processor card for the *SuperLine* Access Shelf. One FETH card resides in each shelf and provides the following features and functions for the shelf:

- Provides fast Ethernet switching to two 10/100Base-T half/full duplex data ports
- Terminates and switches all user data from the QV8 cards

The FETH card is NOT hot swappable. The shelf must be de-energized before a FETH card may be added to or removed from the shelf. Refer to the chapter **Adding and replacing shelf equipment** for instructions.

Shelf power card: POWR

One POWR card resides in each *SuperLine* Access Shelf and provides the following features and functions for the shelf:

- Converts –48V DC to +3.3V DC and +5V DC power
- Primary display panel for shelf alarms
- Miscellaneous alarm connector

The POWR card is NOT hot swappable. The shelf must be de-energized before a POWR card may be added to or removed from the shelf. Refer to the chapter **Adding and replacing shelf equipment** for instructions.

SuperLine POTS Filter Module

The SPFM provides the following features and functions for the *SuperLine* Access Shelf:

- Bandsplitting function
- Interface between the CO switch and the *SuperLine* Access Shelf
- Secondary protection from lightning transients and power cross faults on the external facility
- Interface between External Facilities equipment and the shelf.

SuperLine Integrated Access Device

The *SuperLine* Integrated Access Device is a voice/data device that is installed at the subscriber's premises. Once it is connected to an active phone jack at the subscriber's home or office and *SuperLine* Access System service is activated, the *SuperLine* IAD can be connected to any of the following:

- Baseband voice phone
- Phones used for *SuperLine* voice or data service
- Fax machine
- Modem
- PC equipped with a Network Interface Card (NIC)
- Ethernet hub

(See **Network architecture** figure.) Subscribers can use both *SuperLine* derived voice and Ethernet data services while simultaneously using their baseband voice service.

SuperLine IAD equipment consists of the following components:

- *SuperLine* Integrated Access Device with built-in Customer Premises Equipment Filter (CPEF)
- AC power transformer that plugs into a subscriber's electrical outlet and provides power to the *SuperLine* IAD
- Cable to connect a phone, fax machine, or modem to the *SuperLine* IAD
- One CPEF for insertion in an existing baseband voice phone line not connected to the *SuperLine* IAD to eliminate interference on derived lines generated during phone conversations

For more information on the *SuperLine* IAD, its configuration in the home or office, and using the CPEF in existing baseband voice phone lines, refer to the *SuperLine Integrated Access Device Model 6512-A2 Installation Instructions*.

Daisy-chaining shelves

Two *SuperLine* Access Shelves can be daisy-chained in this release (see **Network architecture** figure) to minimize the number of ports required on a router or a hub for Ethernet data. Data not destined for a shelf is transported transparently from one shelf to the next until it reaches its destination or leaves the daisy chain and enters the data network.

SuperLine Access Shelf management configurations

Craft personnel can manage and communicate with the *SuperLine* Access Shelf three ways using *SuperLine* Element Manager software:

- Simple LAN configuration. The simple LAN management configuration is identical to the configuration used to set up communication between *SuperLine* EM and the *SuperLine* Access Shelf; that is, the PC or workstation running *SuperLine* EM or Multi-EM connects directly to the *SuperLine* Access Shelf through the Craft 10Base-T port on the VDS1 card. This configuration is required to install *SuperLine* Access Shelf firmware for the first time, because the data port on the FETH card initially is disabled.

  This configuration provides direct, out-of-band management. This type of management protects network security, because the channels carrying customer data and network management data are physically separate.

  Important: In this configuration, both Multi-EM and *OpenView* NNM must be installed on the same PC or workstation.

- Complex LAN configuration. This management configuration resembles the simple LAN configuration except that:
  - The *SuperLine* Access Shelf is located on a subnetwork and has an *indirect* IP route to the default gateway.
  - The PC or workstation running *SuperLine* EM or Multi-EM is located remotely from the shelf.
  - The PC and shelf are connected through a hub on the LAN that is connected to the Craft 10Base-T port on the VDS1 card.
- Complex data network with simple LAN configuration. In this configuration:
  - A PC or workstation running *SuperLine* EM or Multi-EM is connected remotely to the 10/100Base-T port on the *SuperLine* Access Shelf's FETH card.
  - Another PC or workstation running *SuperLine* EM or Multi-EM uses a local (LAN) connection to the shelf through the VDS1 card. (A third PC or workstation may also be connected through the LAN.)
  - The default gateway is an indirect route through the IP address for the data network.
  - The type of network management is in-band, meaning that data and other traffic use the same network channel.

Refer to the *SuperLine Access System Element Manager User's Guide* for detailed information on setting up these configurations.

□

SuperLine Access System telephony and data characteristics

SuperLine Access System telephony capabilities

The table below summaries the chief features supported by telephony types DDI, TR-303, and TR-008 Mode 1.

Service	Type	Feature
Line Interface	All	• *SuperLine* Access Shelf supports – single-party two-wire loop start lines – up to two derived lines per *SuperLine* Integrated Access Device – Ethernet data connection • DS0 channels used for transport of voice information.
DS1 Facility Interface	All	• *SuperLine* Access Shelf supports maximum of four DS1 metallic interfaces (DS1-1 through DS1-4) to the local digital switch (LDS). • DS1 interfaces use the following line coding formats: – TR-303 and DDI—Bipolar with 8 Zero Substitution (B8ZS) – TR-008 Mode 1—Bipolar Alternate Mark Inversion (AMI) • DS1 interfaces use the following framing formats: – TR-303 and DDI—Extended Superframe Format with new data link (ESF/NDL). – TR-008 Mode 1—DS1-1: Subscriber Loop Carrier (*SLC*®) 96; DS1-2 through DS1-4: Superframe Format (SF). • Remote Alarm Indication (RAI) transmitted in the outgoing direction when a DS1 terminal determines that it has effectively lost the incoming DS1 signal. • Alarm Indication Signal (AIS) transmitted – unframed and all 1s – in lieu of normal signal to maintain transmission continuity and to indicate to the receiving terminal a transmission fault at the terminal • Network clock synchronization via DS1-1 or, if not attainable, DS1-2 nonrevertive.
	TR-303 and DDI	• ESF bit-oriented data link supports DS1 RAI and far-end loopback control.

Service	Type	Feature
Call Processing	TR-303	• DS0 channels dynamically associated with a working line. • Assigned channels carry Pulse Code Modulation (PCM) and current hook switch signaling state. • A 7F PCM code put on the outgoing DS0 with ABCD = 0010 where DS0 AIS is applicable; otherwise on-hook (ABCD = 0101) is sent. • Timeslot Management Channel (TMC) permanently assigned to channel (DS0) 24 (64K channel) of DS1-1 for primary data link and DS1-2 for secondary link. Primary and secondary links provide data link protection. • Hybrid signaling (ABCD robbed-bit signaling for call control and TMC for connection control) used for call establishment, call clearing, etc. • Link Access Procedure-D (LAPD) used as basis for the call processing data link layer protocol.
	DDI	• DS0 channels fixed. • Assigned channels carry PCM and current hook switch signaling state. • All channels assigned to a specific line unit. A 7F PCM code put on the outgoing DS0 with ABCD = 0010 where DS0 AIS is applicable; otherwise on-hook (ABCD = 0101) is sent. • ABCD robbed-bit signaling for call control and connection control (call establishment, call clearing, etc.)
	TR-008 Mode 1	• DS0 channels fixed. • Assigned channels carry PCM and current hook switch signaling state. • All channels assigned to a specific line unit. An FF PCM code put on the outgoing DS0, with AB = 11 for unequipped channels; otherwise on-hook (AB = 00) sent. • AB robbed-bit signaling for call control and connection control (call establishment, call clearing, etc.).
System Operation	TR-303	• Embedded Operation Channel (EOC) permanently assigned to channel (DS0) 12 (64K channel) of DS1-1 for primary data link and DS1-2 for secondary data link. Primary and secondary links provide data link protection. • EOC used for reporting alarms, provisioning, loopback control, etc. • LAPD used as basis for operations datalink layer protocol.
	TR-008 Mode 1	• Reporting of summary alarms and power/miscellaneous alarms in DS1-1's *SLC* 96 data link.

Data capability

Data bandwidth is shared between derived telephony and Ethernet data services. Subscribers can access the bandwidth available for data using any compatible device that is connected to the 10Base-T Ethernet port on their *SuperLine* Integrated Access Device. Ethernet data is routed to the Local Area Network (LAN) or Wide Area Network (WAN) over Port A, one of two 10/100Base-T connections, on the FETH card.

Derived voice calls take priority over the Ethernet data connection. The total data rate delivered to subscribers is a function of loop loss and whether the derived voice lines are in use.

Mapping derived lines to DS0 channels

In the TR-008 Mode 1 and DDI modes, each derived phone line is mapped to a specific DS0—a channel within a DS1. (To see the derived line–DS0 channel assignments, refer to Appendix C, **DS0 channel assignments for EM telephony configurations**.) In the TR-008 Mode 1 and DDI modes, the relationship between a derived phone line and a DS0 never varies. In the TR-303 mode, however, each derived phone line is mapped dynamically to a DS0 by the CO switch via a message on the TMC.

□

System alarms

Alarms and alarm reporting

The status of circuit packs in the *SuperLine* Access Shelf is individually indicated by Light Emitting Diodes (LEDs) on the front of each card. During normal power-up and initialization, LEDs light. After power-up and initialization completes, the LEDs light only when a re-initialization occurs or when an alarm or fail condition exists. The exception is the green system power-on LED on the POWR card, which lights when power is applied to the shelf.

Important: For help in interpreting alarm information and taking corrective action after the shelf has been installed, refer to the *SuperLine Access System Troubleshooting* guide.

The following table depicts alarm reporting by the type of telephony protocol:

Telephony Type	Alarm information is communicated via ...
TR-303	• LEDs • Element Manager over SNMP • TR-303 EOC data links connected to the switch Refer to the **TR-303 alarm strings** table in this topic for a list of the alarm strings reported to the switch.
TR-008 Mode 1	• LEDs • Element Manager over SNMP • TR-008 Mode 1 *SLC* 96 data link connected to the switch Refer to the **TR-008 Mode 1 alarms** table in this topic for a list of alarms that result in active Major, Minor, and power/miscellaneous alarm information being sent to the switch on the *SLC* 96 data link.
DDI and Data Only	• LEDs • Element Manager over SNMP There is no switch alarm interface.

TR-303 alarm strings

The following table lists the alarms, their origin or entity, the text of the alarms, and their severity that are reported to the switch via the EOC interface. The switch determines how the site processes the alarm strings. Definitions of many of these alarms can be found in the Monitoring equipment status chapter of the *SuperLine Access System Element Manager User's Guide* under the topic Viewing alarms.

Alarm Name	Alarm Origin/Entity	Alarm String	Severity
Free Running	Network Element	`SysFreeRunning*`	Major
Circuit Pack Fail	QV8, VDS1, FETH, POWR	`CPFail`	Major except QV8 card, which is Minor
DS1 Loss of Frame	DS1-1 through DS1-4	`DS1LOF`	Major
DS1 Loss of Signal	DS1-1 through DS1-4	`DS1LOS`	Major
DS1 Yellow	DS1-1 through DS1-4	`DS1Yellow`	Minor
DS1 AIS	DS1-1 through DS1-4	`DS1AIS`	Major
DS1 Loopback	DS1-1 through DS1-4	`DS1Loopback`	Minor
TR-303 Datalink Failure	EOCPRI, EOCSEC, TMCPRI, TMCSEC	`TR303DatalinkFail`	Minor (single) Major (dual)
Temperature Alarm	Network Element	`TemperatureAlarm`	Major
(External) Power Major	Network Element	`PowerMajor`	Major
(External) Power Minor	Network Element	`PowerMinor`	Minor
Power Battery Discharge	Network Element	`BatteryDischarging`	Major
Power Fuse	Network Element	`Fuse`	Major
Miscellaneous 1 Alarm	Network Element	`Misc1Alarm`	Major
Miscellaneous 2 Alarm	Network Element	`Misc2Alarm`	Major
Power Out of Tolerance	POWR Card	`PowerOutOfTolerance`	Major
Door Opened	Network Element	`DoorOpened`	Minor
*****Not reported over the EOC interface because the DS1s carrying the data links are not in service.			

TR-008 Mode 1 alarms

The following is a list of alarms that result in active major, minor, and power/miscellaneous alarm information being sent on the *SLC* 96 data link. Definitions of many of these alarms can be found in the Monitoring equipment status chapter of the *SuperLine Access System Element Manager User's Guide* under the topic Viewing alarms.

Alarm Name	Alarm Origin/Entity	TR-008 Mode 1 Summary Alarm		
		Major	Minor	Pwr/Misc
Circuit Pack Fail	VDS1 or FETH Card	✓		
Circuit Pack Fail	POWR Card			✓
Circuit Pack Fail	QV8 Card		✓	
Circuit Pack Incompatible	VDS1, FETH, POWR	✓		
Circuit Pack Incompatible	QV8 Card		✓	
DS1 Loss of Signal, Loss of Frame, or AIS	DS1-1 through DS1-4	✓		
DS1 Yellow Detected	DS1-1 through DS1-4		✓	
DS1 Loopback	DS1-1 through DS1-4		✓	
Temperature Alarm	Network Element			✓
(External) Power Major	Network Element			✓
(External) Power Minor	Network Element			✓
Power Battery Discharge	Network Element			✓
Power Fuse	Network Element			✓
Miscellaneous 1 Alarm	Network Element			✓
Miscellaneous 2 Alarm	Network Element			✓
Power Out of Tolerance	POWR Card			✓
Door Opened	Network Element			✓

□

2 Hardware description

Overview

Introduction

This chapter provides an overview of a fully equipped AG Communication Systems *SuperLine*™ Access Shelf. It then details the operation of each shelf card and the *SuperLine* POTS Filter Module (SPFM). It describes the physical traits and environmental requirements for the shelf and SPFM and concludes with a description of required and optional hardware components and part numbers.

In this chapter

This chapter covers the following topics:

□

Introduction to the *SuperLine* Access Shelf

SuperLine Access Shelf components

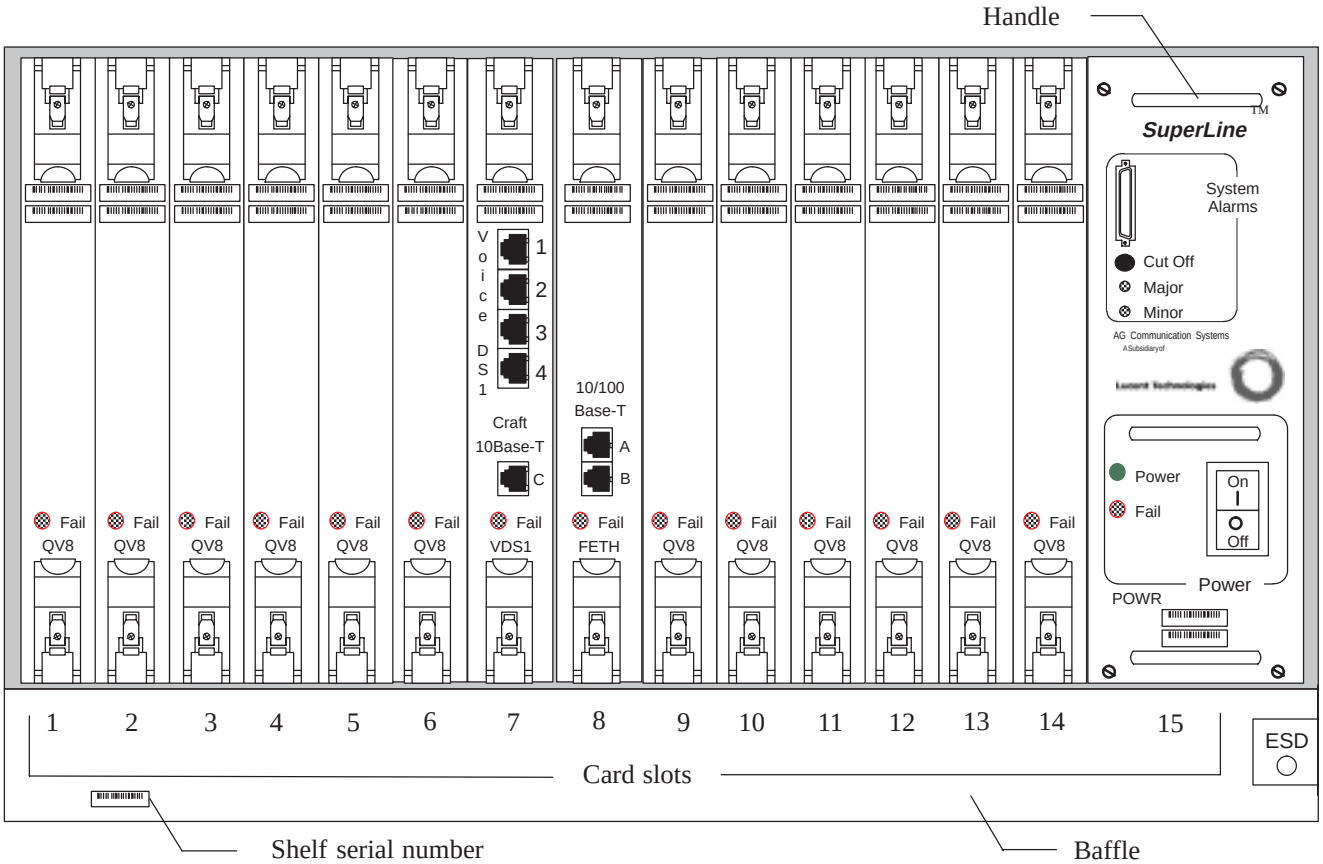
As shown in the figure **Fully equipped *SuperLine* Access Shelf**, the shelf contains the following types of circuit packs:

- Quadrature Amplitude Modulation Voice 8 (QV8) line card
- Fast Ethernet (FETH) switch card
- Voice DS1 (VDS1) processor card
- Power (POWR) supply card

These components and their functions are described in detail later in this chapter.

Fully equipped *SuperLine* Access Shelf

The following figure depicts the front view of a fully equipped *SuperLine* Access Shelf. The shelf can hold up to 12 QV8 cards, one VDS1 card, one FETH card, and one POWR card. All cards have LEDs that light when the shelf is initializing. If a card is in the Fail condition, the Fail LED will also light.



Baffles

A baffle is included as part of each *SuperLine* Access Shelf module (see figure **Fully equipped *SuperLine* Access Shelf**). The shelf requires 8U (1U = 1.75 inches) of mounting space. The shelf card area fills the upper 6U, and the baffle fills the lower 2U of the shelf.

The baffle serves the following purposes for the shelf:

- Allows air intake from the front of the shelf and directs it into the card area to allow for convection cooling of the shelf's electronics.
- Directs hot air from a lower shelf or other equipment residing in the same rack to the rear of the shelf, where it exits the equipment.
- Supplies the location for attaching the electrostatic discharge (ESD) wrist strap.

If a *SuperLine* Access Shelf is installed above another shelf, it can be placed directly over the lower one. If equipment other than a *SuperLine* Access Shelf is installed above the shelf, a 2U baffle or 1.5U of empty space is required between it and the shelf below it.

□

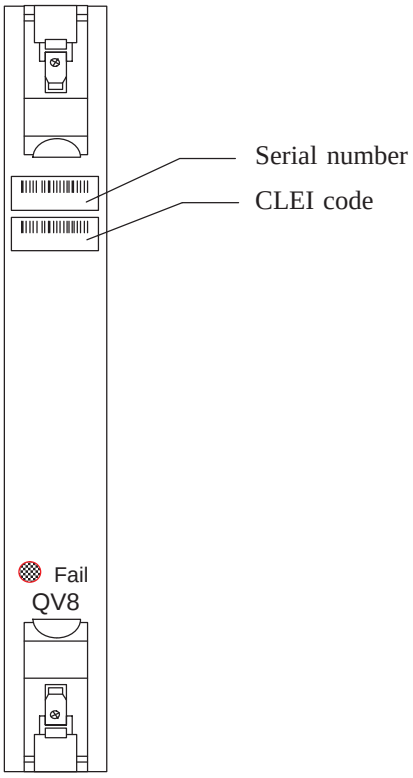
QV8 card

Description

The QV8 card supports eight subscribers with up to two derived lines and Ethernet service. QV8 cards are the only shelf cards that are hot swappable; that is, they can be installed in or removed from a *SuperLine* Access Shelf while the shelf is energized (powered on) without damaging the cards or disrupting service (voice or Ethernet) on other shelf cards.

QV8 card

The following figure shows the front view of QV8 card. A maximum of 12 QV8 cards can be installed in one *SuperLine* Access Shelf.



Fail LED indicator

QV8 cards have one Fail LED on the front panel as shown in the **QV8 card** figure. The LED lights (turns red) during normal power-up and initialization. After power-up and initialization have completed, the Fail LED lights only when a re-initialization occurs or the card is in a fail condition.

□

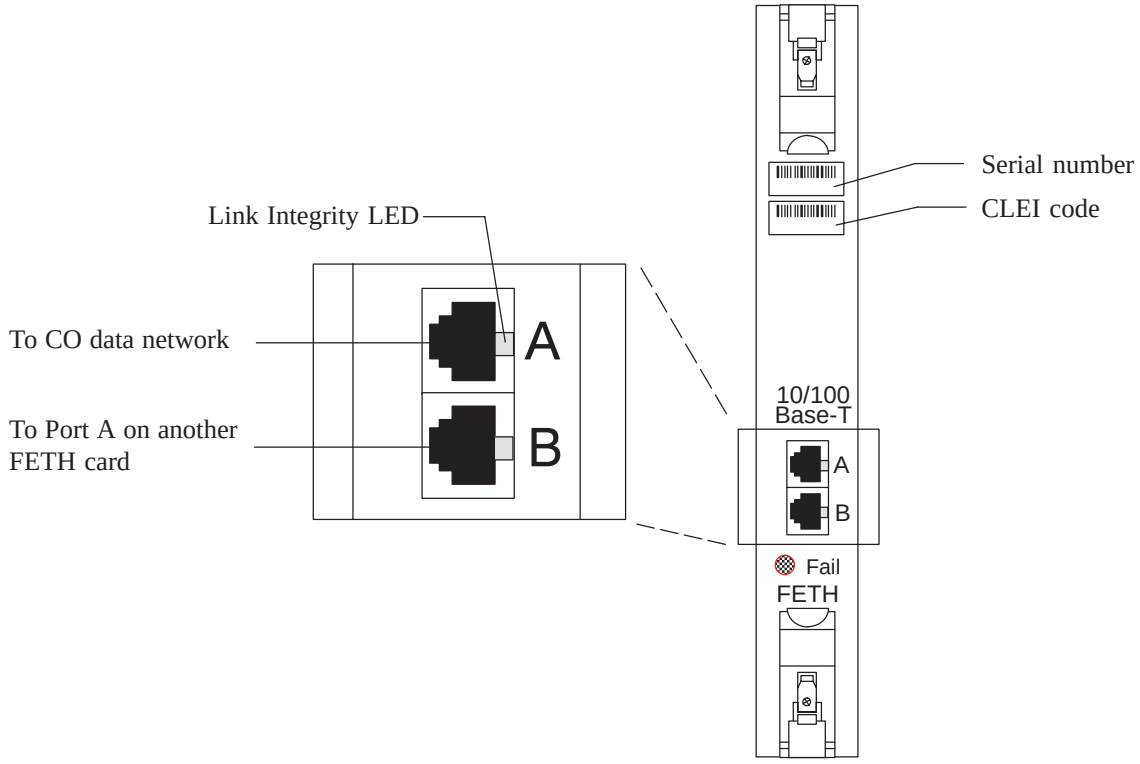
FETH card

Description

The FETH card interconnects up to 12 QV8 cards to the VDS1 card using an internal 10Base-T Ethernet bus, one bus for each QV8 card. The FETH card also has two 10/100Base-T Ethernet ports, A and B, as shown in the **FETH card** figure below. Port A provides the shelf connection to the data network. Port B, if it is used, connects the master (main) shelf to Port A on subordinate shelves when shelves are daisy-chained. (Only two *SuperLine* Access Shelves may be daisy-chained in this release.) The subordinate shelves have no connection to the data network except through the master.

FETH card

The following figure shows the front view of the FETH card. The card has two RJ-45 jack connections. The green Link Integrity LED lights when the port has a valid 10/100Base-T connection. If no valid connection exists, the LED remains unlighted.



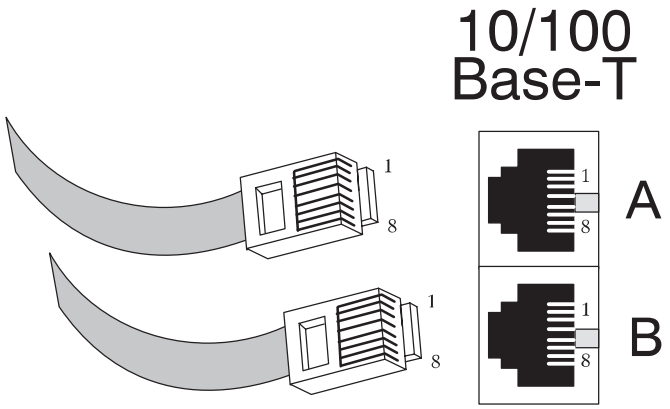
Important: The FETH card is NOT hot swappable. The shelf must be de-energized before a FETH card may be added to or removed from the shelf. Refer to the chapter **Adding and replacing shelf equipment** for instructions.

Fail LED indicator

The Fail LED located on the front of the FETH card is used to indicate the status of the card. This LED turns red during normal power-up and initialization. After power-up and initialization are complete, the Fail LED lights only when a re-initialization occurs or the card is in a fail condition.

RJ-45 jack and pin connections

The following figure shows the jack and cable pins 1–8 that are associated with the pin definitions described in the **RJ-45 pinouts** table. All *SuperLine* Ethernet traffic to and from the data network goes through either one or both of these RJ-45 jacks.



RJ-45 pinouts

Pin assignments for the FETH card are as follows:

Pin Number	Signal
1	TD+ (Transmit Data)
2	TD– (Transmit Data)
3	RD+ (Receive Data)
4	Unused
5	Unused
6	RD– (Receive Data)
7	Unused
8	Unused

VDS1 card

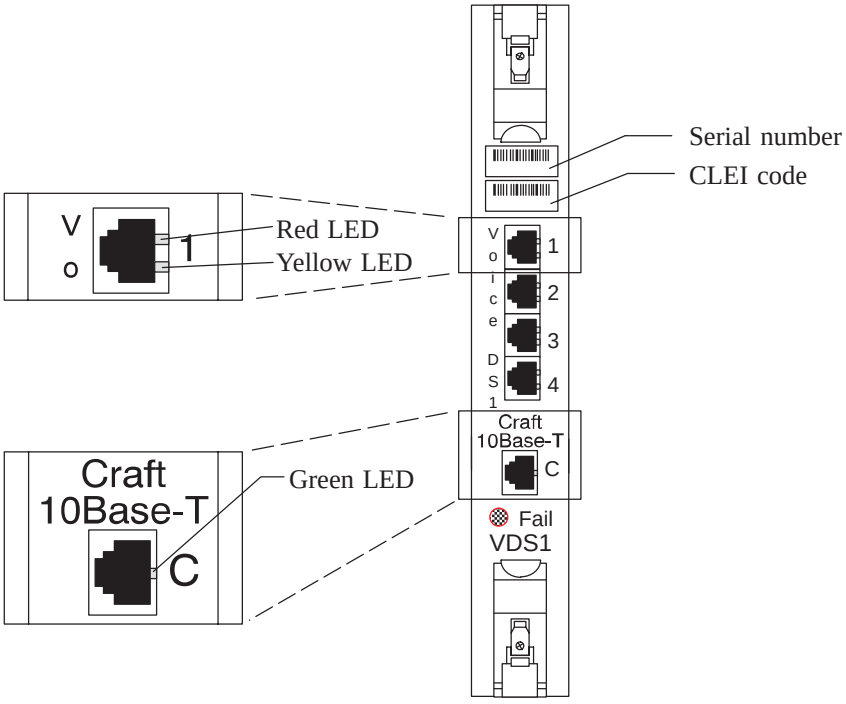
Description

The VDS1 card (see **VDS1 card** figure) performs the following main functions for the *SuperLine* Access Shelf:

- Host Central Processor Unit
- Craft 10Base-T connection
- DS0 channel assignments and timeslot interchange
- DS1 physical interface
- Network clock synchronization

VDS1 card

The following figure shows the front view of the VDS1 card. The card has four DS1 ports, labeled 1–4, and one Craft 10Base-T connection, labeled C. The Fail LED and the red Local Alarm and yellow Remote Alarm LEDs on the DS1 ports light during power-up and initialization. The red and yellow LEDs on the DS1 ports indicate alarm conditions when lighted after power-up and initialization. The green Link Integrity LED on the Craft 10Base-T port lights when it has a valid connection.



Important: The VDS1 card is NOT hot swappable. The shelf must be de-energized before a VDS1 card may be added to or removed from the shelf. Refer to the chapter **Adding and replacing shelf equipment** for instructions.

Host CPU function

The host CPU on the VDS1 card acts as the module control point for collecting and reporting information to the SuperLine Element Manager. It receives and distributes the software load images for subtending processors. It also does provisioning and timeslot management for the voice DS1s.

All administrative messages, including provisioning messages, data collection messages, and software download data, flow through the host CPU. The VDS1 card also includes the RJ-45 Craft 10Base-T connection (Port C) for the SuperLine Element Manager.

DS0 channel assignments and timeslot interchange

The VDS1 card contains circuitry that allows the card to perform DS0 channel assignments, as instructed by the host CPU, and the voice timeslot interchange (TSI) function. For information on DDI and TR-008 channel assignments, refer to Appendix C, **DS0 channel assignments for EM telephony configurations**.

DS1 physical interface

A Quad DS1 transceiver, a Quad line driver, and accompanying magnetics provide the DS1 physical interface.

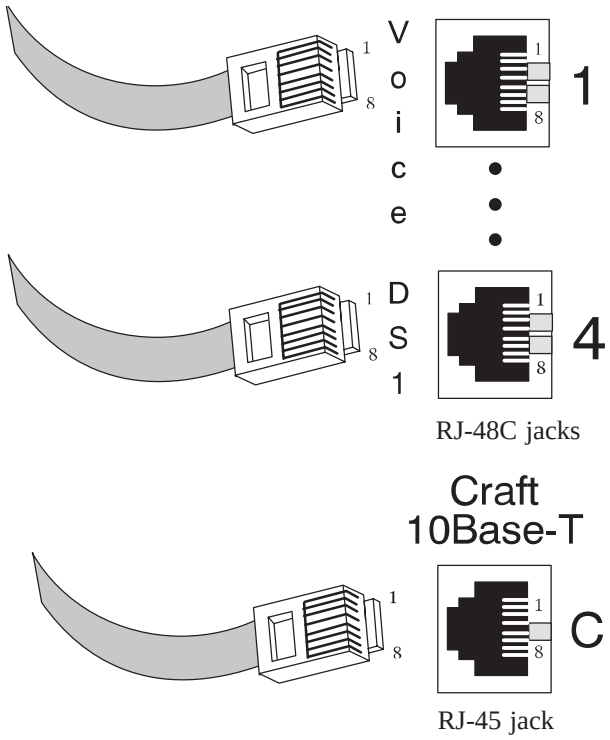
- The DS1 transceiver provides the Extended Superframe (ESF) framing for DDI and TR-303 telephony types. It provides SLC 96 and Superframe (SF) Format for TR-008 Mode 1 telephony type.
- The DS1 line driver provides Alternate Mark Inversion (AMI), used in TR-008 Mode 1 telephony mode, and Bipolar 8-bit Zero Substitution (B8ZS), used in DDI and TR-303 telephony modes.

Network clock synchronization

The *SuperLine* Access Shelf uses two DS1 lines for attaining network clock synchronization. The DS1 input stream (from the network) switches automatically from the primary DS1 (DS1-1) to the secondary DS1 (DS1-2) to provide synchronization to the shelf when synchronization is not attainable via the primary DS1. The reverse is true if synchronization is lost on the secondary DS1. If a signal is not available from either DS1, the shelf uses its internal clock source (free runs).

RJ-45 and RJ-48C jack connections

The following figure shows the five jack connections on the front of the VDS1 card and the cable pins 1–8 that are associated with the pin definitions described in the **RJ-45 pinouts** and the **RJ-48C pinouts** tables.



RJ-48C jacks

RJ-45 jack

RJ-45 pinouts

The craft terminal 10Base-T Ethernet connection located on the front of the VDS1 card uses an RJ-45 cable connector (see **RJ-45 and RJ-48C jack connections** figure). Pin assignments for this connection are as follows:

Pin Number	Signal
1	TD+ (Transmit Data)
2	TD– (Transmit Data)
3	RD+ (Receive Data)
4	Unused
5	Unused
6	RD– (Receive Data)
7	Unused
8	Unused

RJ-48C pinouts

The DS1 connections located on the front of the VDS1 card use an eight-position RJ-48 miniature modular jack (see **RJ-45 and RJ-48C jack connections** figure**)**. Pin assignments for this connection are as follows:

Pin Number	Signal
1	Receive Ring
2	Receive Tip
3	Unused
4	Transmit Ring
5	Transmit Tip
6	Unused
7	Unused
8	Unused

Fail LED indicator

The Fail LED located on the front of the VDS1 card is used to indicate the status of the card. This LED turns red during normal power-up and initialization. After power-up and initialization are complete, the Fail LED lights only when a re-initialization occurs or the card is in a fail condition.

Voice DS1 LED indicators

Each DS1 connection to the VDS1 card has a red Local Alarm LED and a yellow Remote Alarm LED to indicate the status of the DS1s. During power-up and initialization, all DS1 Local LEDs light (turn red) and all DS1 Remote LEDs light (turn yellow). During normal operations, the Local and Remote LEDs are extinguished (not lighted).

□

POWR card

Description

The POWR card provides the power conversion from –48V DC to +5V and +3.3V DC power for the *SuperLine* Access Shelf.

Front panel components

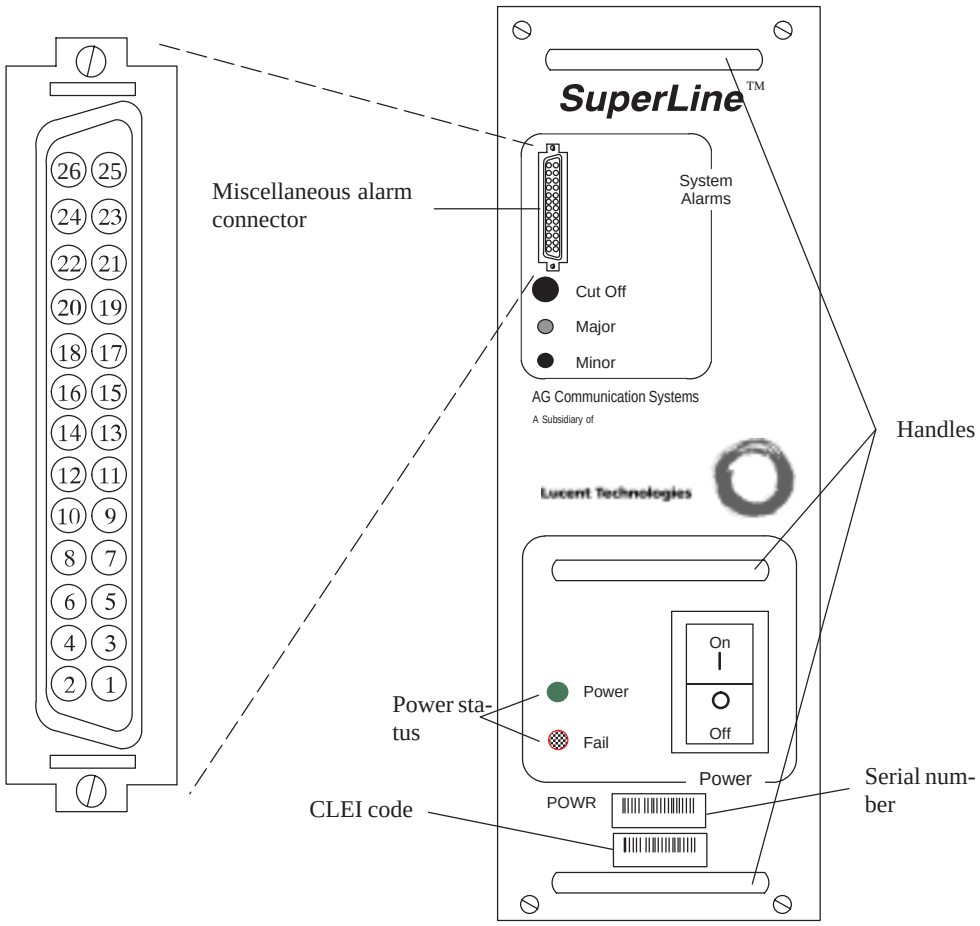
The components in the list below appear on the front panel of the POWR card (see **POWR card and alarm pinouts** figure in this topic).

- In the System Alarms, upper portion of the POWR card:
  - Miscellaneous alarm connector
  - Alarm Cut Off button
  - Major shelf alarm LED (red)
  - Minor shelf alarm LED (yellow)
- In the lower portion of the POWR card:
  - Shelf power-on LED (Power). This LED turns green when the power is on.
  - Fail LED
  - On/Off rocker switch for the POWR card
  - Serial number identification
  - Common Language Equipment Identification (CLEI) code

POWR card and alarm pinouts

The following figure shows the front view of the POWR card with Miscellaneous alarm connector pin assignments and signal names.

Pin	Signal
26	Not used
25	Not used
24	Not used
23	Chassis ground
22	Chassis ground
21	Relay contact 1
20	Power Minor Alarm
19	Battery Discharging
18	Fuse blown
17	Door open
16	Misc 2 (user alarm 1)
15	Power Major Alarm
14	Misc 1 (user alarm 0)
13	Not used
12	Not used
11	Not used
10	Chassis ground
9	Chassis ground
8	Relay contact 2
7	Electronic ground
6	Electronic ground
5	Electronic ground
4	Electronic ground
3	Electronic ground
2	Electronic ground
1	Electronic ground



Alarms

All alarm pairs are inputs to the POWR card and are designed to accept dry relay contacts. The following table shows the logical pairing of the alarm wires by name, pin, and color per supplied cable.

Alarm Name	Pin Number	Color	Alarm Name, Electronic Ground (EG)	Pin Number	Color
Misc 1	14	Blue	Misc 1, EG	1	White-Blue
Power Major Alarm	15	Orange	Power Major Alarm, EG	2	White-Orange
Misc 2	16	Green	User Alarm 1, EG	3	White-Green
Door Open	17	Brown	Door Open, EG	4	White-Brown
Fuse Blown	18	Slate	Fuse Blown, EG	5	White-Slate
Battery Discharging	19	Blue-Red	Battery Discharging, EG	6	Red-Blue
Power Minor Alarm	20	Orange-Red	Power Minor Alarm, EG	7	Red-Orange

Relay contacts

Relay contacts are intended for audible alarms. The relay contact pairs are dry contact outputs. The following table identifies the floating relay contacts by name, pin, and color.

Relay Name	Pin Number	Color
Relay Contact 1	21	Green-Red
Relay Contact 2	8	Red-Green

Alarm Cut Off button

When pressed, the Alarm Cut Off button shuts off audible alarms by opening the alarm relay if the audible alarm is wired to pins 8 and 21 (refer to **Relay contacts** table). The audible alarm contacts reactivate when another Major shelf alarm is declared. If the Major shelf alarm LED is lit, it remains lit and is not cleared with this button.

Alarm relay contacts

When a Major shelf alarm is determined by the VDS1 card, the Major shelf alarm LED lights and the relay contact closes. This relay contact is normally open whenever the Major shelf alarm is de-asserted (turned off) or when the Alarm Cut Off button is depressed. A closed relay contact indicates an alarm condition.

Major shelf alarm LED (red)

The Major shelf alarm LED light (turns red) during shelf power-up and initialization or when a Major shelf alarm condition exists within the shelf.

Minor shelf alarm LED (yellow)

The Minor shelf alarm LED lights (turns yellow) during shelf power-up and initialization or when a Minor shelf alarm condition occurs.

Major and minor alarms are mutually exclusive except during shelf power-up and initialization.

Fail LED indicator

The Fail LED located on the front of the POWR card is used to indicate the status of the card. This LED lights (turns red) only when regulated voltages are out of tolerance.

□

SuperLine POTS Filter Module

Description

The *SuperLine* POTS Filter Module is a passive filter splitter. It is connected to the *SuperLine* Access Shelf with 50-pin telco connectors.

The *SuperLine* POTS Filter Module provides the interface between the telco CO switch and the *SuperLine* subscriber lines (baseband voice lines) connected to the *SuperLine* Access Shelf and the External Facilities lines.

The SPFM assembly has the following functions:

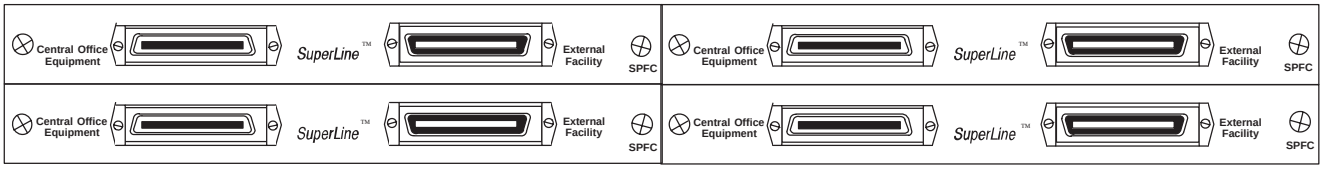
- Provides the bandsplitting function for the *SuperLine* Access Shelf.
- Supports up to 96 baseband voice lines.
- Provides low-pass filtering to protect baseband voice line cards against interference from derived line frequencies.
- Provides secondary lightning and power cross protection for the *SuperLine* Access Shelf.

The SPFM is polarity sensitive. For information on SPFM tip and ring pin assignments, refer to Appendix A, **SPFM front panel pin assignments**, and Appendix B, **SPFM rear panel pin assignments**.

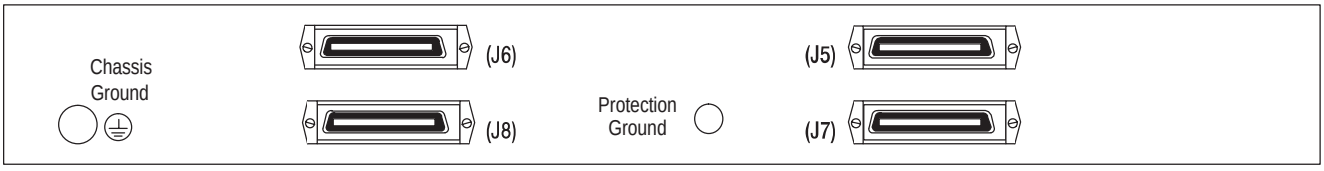
SPFM front and rear views

Four *SuperLine* POTS filter cards (SPFCs) are provided per SPFM, as shown in the following figure.

SPFM, Front View



SPFM, Rear View



CO Equipment and External Facilities connections

CO Equipment and External Facilities connectors are located on the front panel of the SPFM. The wiring connections follow standard communication cable practice for 50-pin conductor cable equipped with telco connectors.

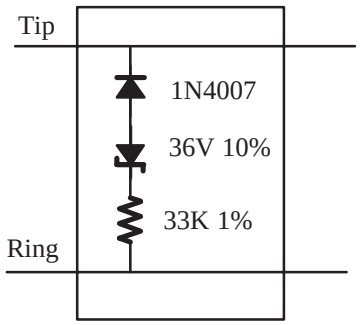
The CO Equipment and External Facilities cables may be connected together to maintain baseband voice service in the event that an SPFC is removed and replaced. (For connection instructions, refer to the procedure **Replacing a *SuperLine* POTS filter card** in the Adding and replacing shelf equipment chapter.)

Added maintenance test signature circuit

To allow the SPFM to be managed by the network maintenance systems and to be identified by metallic loop test systems, the SPFM contains maintenance test signatures (see figure) that are activated only by the metallic test systems (e.g., mechanized loop testing, Teradyne's *4TEL*®). The maintenance test signature is designed to be active only during the maintenance test mode and will not interfere with normal operation of the line.

CO maintenance test signature

As required by ANSI T1.413 Annex E, all CO-end SPFMs have the same maintenance test signature on each tip and ring pair.



□

SuperLine Access System equipment specifications

SuperLine Access Shelf specifications

Physical traits and environmental requirements for the *SuperLine* Access Shelf are shown in the following table.

Dimensions	13.73 in. (H), 23.0 in. (W), 12.0 in. (D) without cables, 15.0 in. with cables (D)
Weight	21.7 lb without cards, 40 lb with cards.
Input Power	–42 to –56V DC, dual source, wired and fused for 12A (safety listed to UL 1950/ CSA C22.2 No. 950)
Nominal Input Power	182 watts
Maximum Input Power	320 watts
Short-term environment	
Temperature	23°F (–5°C) to 122°F (50°C)
Rate of temperature change	54°F (30°C) per hour
Relative humidity	5 to 90 percent, NOT to exceed 0.02 kg water/kg dry air
Operating environment	
Temperature	41°F (5°C) to 104°F (40°C)
Rate of temperature change	54°F (30°C) per hour
Relative humidity	5 to 85 percent

SPFM specifications

The following table lists physical traits of the SPFM. The SPFM is a passive device that does not require input power.

Dimensions	2.625 in. (H), 23.0 in. (W), 13.25 in. (D) with cards, 14.25 in. with cards and cables (D)
Weight	8.65 lb without cards, 19.75 lb with cards
Short-term environment	
Temperature	23°F (–5°C) to 122°F (50°C)
Rate of temperature change	54°F (30°C) per hour
Relative humidity	5 to 90 percent, NOT to exceed 0.02 kg water/kg dry air
Operating environment	
Temperature	41°F (5°C) to 104°F (40°C)
Rate of temperature change	54°F (30°C) per hour
Relative humidity	5 to 85 percent

NEBS requirements

The *SuperLine* Access Shelf and the SPFM may be used in a CO environment or a remote cabinet. Either configuration meets Network Equipment Building Standard (NEBS), Level 3 requirements.

□

SuperLine Access System equipment parts list

Hardware components and part numbers

The following table lists information about *SuperLine* Access System hardware components.

Component Mnemonic	*SuperLine*™ Access System Component Description	Part Number	Quantity per Shelf	Quantity per Frame
FETH	Fast Ethernet switch	FB-30102-1A	1	1–5
POWR	Power supply and display panel card	FB-30080-A	1	1–5
POWR	Power supply and display panel card for NEBS compliance	FB-30080-1A	1	1–5
QV8	Quadrature Amplitude Modulation Voice 8 circuit line card	FB-30101-A	1–12	12–60
DSLM	*SuperLine* Access Shelf	EC-30267-A	1	1–5
DSLM	*SuperLine* Access Shelf for NEBS compliance	EC-30267-B	1	1–5
SPFC	*SuperLine* POTS filter circuit, 5th order	FB-30107-A	4	4–20
SPFM	*SuperLine* POTS Filter Module	EC-30288-A	1	1–5
VDS1	Voice DS1 card	FB-30103-1A	1	1–5
VDS1	Voice DS1 card for NEBS compliance	FB-30103-2A	1	1–5
BLNK	Blank faceplate to replace QV8 cards not equipped	EC-30273-A	1–12	12–60

SuperLine Access System cables

The following table lists information about required and optional cables.

Cable Description and Orientation	Part Number	Quantity per Shelf	Quantity per Frame	Vendor
Rear *SuperLine*™ Access Shelf and SPFM Cables				
Shelf chassis ground—shelf to ground tap	EC-30227-B	1	1–5	AG Communication Systems
SPFM chassis ground—SPFM to ground tap	EC-30227-B	1	1–5	AG Communication Systems
SPFM protection ground—SPFM to line protection ground (LPG) tap	EC-30227-C	1	1–5	AG Communication Systems
Shelf backplane power cable	EC-30205-A	2	2–10	AG Communication Systems
Shelf to SPFM (see important note at end of table)	EC-30312-A10	1–4	4–20	AG Communication Systems
Front SPFM Cables				
SPFM to CO Equipment; 50-pin receptacle and receptacle assembly. To be cross-connected with CO line circuit if the distributing frame terminal blocks are connectorized	EC-16324-Axx or	1–4	4–20	AG Communication Systems or telco
SPFM to CO Equipment; 50-pin open-ended receptacle assembly. To be cross-connected with CO line circuit if the distributing frame terminal blocks are NOT connectorized	EC-16325-Axx			
SPFM to External Facility; 50-pin plug and receptacle assembly. To be cross-connected with External Facility line circuit if the distributing frame terminal blocks are connectorized	EC-16326-Axx or	1–4	4–20	AG Communication Systems or telco
SPFM to External Facility; 50-pin open-ended plug assembly. To be cross-connected with External Facility line circuit if the distributing frame terminal blocks are NOT connectorized	EC-16327-Axx			

Cable Description and Orientation	Part Number	Quantity per Shelf	Quantity per Frame	Vendor
Front POWR Card Cable				
Shielded alarm cable from POWR card to customer's equipment frame or alarm terminal block	EC-30285-A10	1	5	AG Communication Systems
Front VDS1 Card Cables				
10/100Base-T craft interface shielded Category 5 Ethernet straight-through cable—VDS1 to craft interface	EC-30282-Ayy or	1	1–5	AG Communication Systems or telco
10/100Base-T craft interface unshielded Category 5 Ethernet straight-through cable—VDS1 to craft interface	EC-26805-Byy			
24 AWG unshielded DS1 cable assembly from VDS1 to DSX panel	EC-30251-Azz	1–4	1–20	AG Communication Systems or telco
10/100Base-T craft interface shielded Category 5 Ethernet crossover cable	EC-26806-Ayy or	1	N/A	AG Communication Systems or telco
10/100Base-T craft interface unshielded Category 5 Ethernet crossover cable	EC-30366-Ayy			
Front FETH Card Cable				
10/100Base-T data network shielded Category 5 Ethernet straight-through cable—FETH to data network	EC-30282-Ayy or	1	1–5	AG Communication Systems or telco
10/100Base-T data network unshielded Category 5 Ethernet straight-through cable—FETH to data network	EC-26805-Byy			

Important:

1. Part numbers are for cables ordered from AG Communication Systems.
2. For an illustration of the shelf-to-SPFM connections, see the figure **Rear shelf and SPFM connections** in the topic Cabling the SPFM to the shelf, which is in the Installation chapter.

Important, continued:

3. The alpha designators xx, yy, and zz at the end of cable part numbers refer to cable lengths if purchased from AG Communication Systems. For example, EC-30282-A50 indicates a 50-foot FETH card cable. Cable lengths are available from AG Communication Systems in the following increments:
   - xx
     – 5-foot increments in lengths from 10 ft to 50 ft.
     – 10-foot increments in lengths from 50 ft to 250 ft.
     – 50-foot increments in lengths over 250 ft.
   - yy
     – 5-foot increments in lengths from 5 ft to 25 ft.
     – 25-foot increments in lengths from 25 ft to 325 ft.
   - zz
     – 5-foot increments in lengths from 5 ft to 25 ft.
     – 25-foot increments in lengths from 25 ft to 500 ft.
     – 50-foot increments in lengths from 50 ft to 650 ft.
4. Maximum length for the DS1 cable is 655 ft. Maximum length for 10Base-T and 100Base-T signals is 100 meters (328 ft). Refer to IEEE 802.3, *Local and Metropolitan Area Networks—Type 10Base-T Medium Attachment Unit (MAU) Protocol Implementation Conformance Statement (PICS) Proforma*.

SuperLine Access Shelf component connectors

The *SuperLine* Access Shelf components require connections to external devices. The following table lists the connectors that are accessible from the *SuperLine* Access Shelf for each of the components.

Shelf Connection	Connector Type	Connector Quantity	Facilities Equipment Connection
Backplane	50-pin Telco	4	192 pairs of tip/ring lines
Backplane	3-pin Positronic Powr-Lok	2	Duplex –48V DC/Return
FETH	Dual RJ-45	1	10/100Base-T
POWR	2 x 13 Subminiature D Connector	1	Alarm and Miscellaneous Sensor
VDS1	Female RJ-45	1	Craft 10Base-T
VDS1	RJ-48C	4	4 DS1s

DS1 cable connectors

The following connectors can be used when making DS1 cables to connect to the DS1 ports on the VDS1 card.

Cable Description	Part Number	Connector Type	Connector Quantity	Vendor
DS1 shielded connector	FD-1036-CG4	Male RJ-48C	4 + 2 spares	AG Communication Systems

□

3 Shelf configurations

Overview

Introduction This chapter provides information that is useful for planning and creating the proper environment for the AG Communication Systems *SuperLine*™ Access System.

In this chapter This chapter covers the following topics:

□

Floor planning requirements

Guidelines

Floor planning requirements for the *SuperLine* Access System should follow switch equipment manufacturer's guidelines. Users of GTE's *GTD-5*® EAX equipment should consult AG Communication Systems Practice, *Floor Plan Requirements Engineering and Planning Guidelines*, 780-224-071. Users of Lucent Technologies *5ESS*® and Nortel Networks *DMS*™ switches should consult equivalent documentation.

□

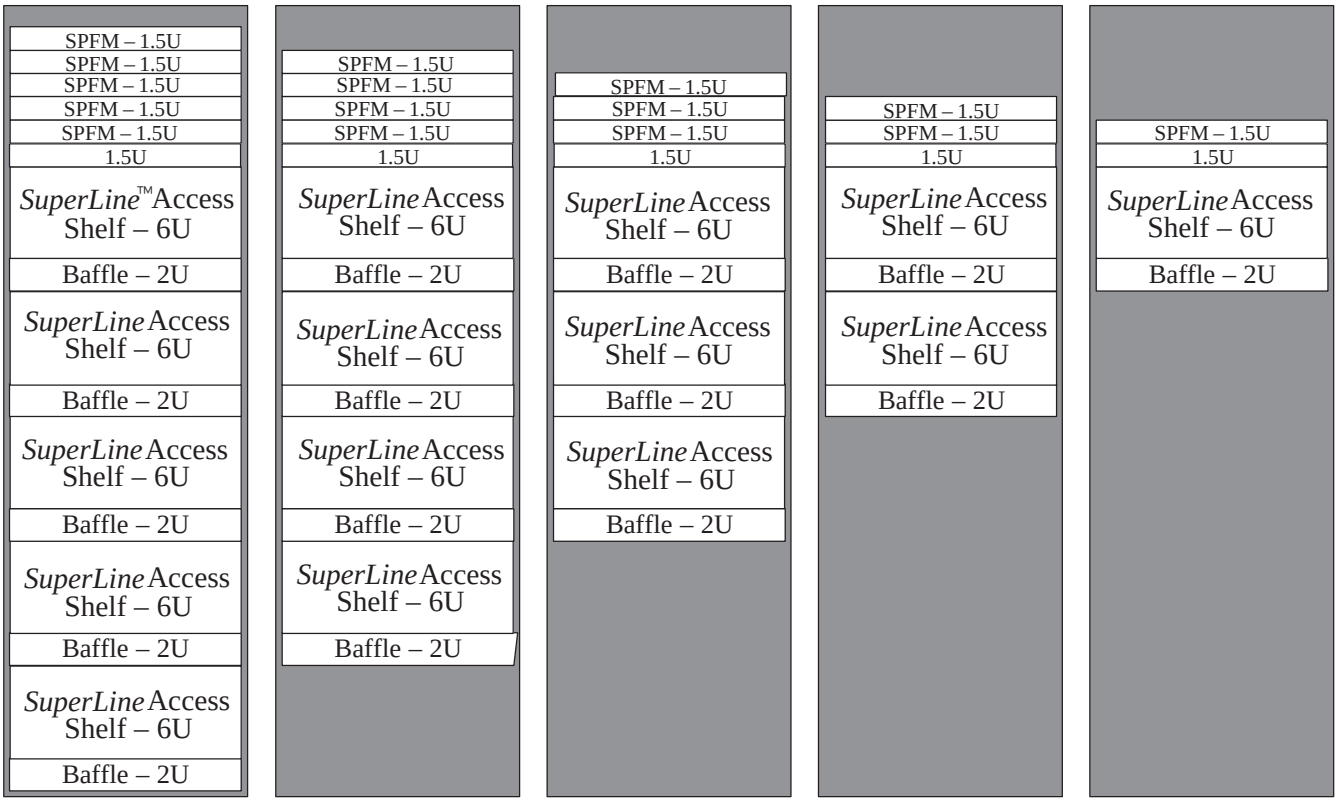
Frame configurations

Frame configurations

SuperLine Access System equipment can be purchased preinstalled in a standard telco frame, with all internal wiring installed by the factory, or it can be purchased individually and mounted in any standard telco frame with 23-inch rack mounting and universal spacing. Up to five *SuperLine* Access Shelves and their associated *SuperLine* POTS Filter Module (SPFM) assemblies can reside in a single 8-foot (49U) rack frame and remain Network Equipment Building Standard (NEBS) compliant.

SuperLine Access Shelves and SPFMs in telco frames

The following figure shows the possible frame configurations when *SuperLine* Access Shelves and SPFMs are installed in an 8-foot rack frame (see **Caution**, next page).



SuperLine is a trademark of AG Communication Systems.

CAUTION
Equipment damage hazard

To meet GR-63-CORE requirements, always install the SuperLine POTS Filter Module or modules ABOVE the SuperLine Access Shelf or shelves with at least a 1.5U (2.625 inch) space between the bottom SPFM and the top SuperLine Access Shelf. If equipment other than an SPFM is installed above a SuperLine Access Shelf, install a 2U baffle.

Frame configuration guidelines

Telco customers can install multiple *SuperLine* Access Shelves and SPFMs in a dedicated rack or in a miscellaneous rack with other equipment by adhering to the following guidelines:

- Meet the floor planning requirements as specified in the switch equipment manufacturer's guidelines.
- One-to-five *SuperLine* Access Shelves and their associated SPFMs can be installed in an 8-foot rack by maintaining either a 2U baffle (similar to the one supplied in a *SuperLine* Access Shelf) above each shelf or placing an SPFM 1.5U above the *SuperLine* Access Shelf.
- If equipment other than *SuperLine* Access Shelves or SPFMs are installed in the rack, it is recommended that this equipment be placed below the *SuperLine* Access Shelf.
- If equipment other than *SuperLine* Access Shelves and SPFMs is installed above *SuperLine* Access System equipment, it is required that an SPFM be placed below the other equipment, leaving a space between the other equipment and the SPFM as recommended by the other manufacturer's guidelines.

Mounting requirements

Observe the following mounting requirements:

- If installed in a *GTD-5* EAX site, the *SuperLine* Access Shelf and SPFM each require the following:
  - One set of mounting hardware.
  - Four D-76604-B screws and four EF-16917-A nylon inserts if they are mounted in a frame configured for isolation mounting.
- If the *SuperLine* Access Shelf and SPFM are mounted in a rack configured for isolation mounting and the rack has round mounting holes, use suitable nylon flat washers and screws capable of isolating and supporting the weight of the mounted equipment.

□

4 Installation

Overview

Introduction

This chapter consists of the procedures that are applicable to the successful installation of the AG Communication Systems *SuperLine*™ Access System.

In this chapter

This chapter covers the following topics:

□

Introduction to installing shelf equipment

Introduction

This chapter contains procedures for installing the *SuperLine* Access Shelf and the *SuperLine* POTS Filter Module (SPFM) assembly at the central office (CO). Up to five *SuperLine* Access Shelves and five SPFMs may be installed in a standard 8-foot telco rack frame. Safety practices are reinforced in this chapter to make sure that craft personnel know when special care is needed to handle equipment.

Many of the procedures in this chapter are generic in the sense that they can be used to install switching equipment from multiple manufacturers. However, some procedures contain switch-specific information, and that information is clearly identified in switch-specific examples.

Minimum switch configuration

Installing *SuperLine* Access System equipment requires the switch site to have the following minimum configuration to allow for growth:

Switch Site	Minimum Configuration
GTE *GTD-5*® EAX	• DDI—Extended-Superframe Digital Trunk (EDT) • TR-303—EDT and Integrated Remote Operations Controller (IROC) platform
Lucent Technologies *5ESS*®	• TR-303—Integrated Digital Carrier Unit (IDCU) • TR-008 Mode 1—IDCU or Digital Carrier Line Unit (DCLU)
Nortel Networks Corporation *DMS*™	• TR-303—Subscriber Carrier Module–100 Access (SMA2) • TR-008 Mode 1—Subscriber Module *SLC*®96 (SMS)

Assumptions

The following assumptions are made:

- Personnel installing the *SuperLine* Access Shelf and SPFM are familiar with the specific switching equipment in their central office.
- All safety instructions are read prior to installation. Any safety equipment necessary for installing *SuperLine* Access System equipment, such as insulating blankets and tools, is available to the installer for use during installation.

DMS users only

The following items are documented here to describe the unique behavior of the *DMS* switch with the *SuperLine* Access Shelf. This behavior is a consequence of the *DMS* switch design and is not related to any *SuperLine* Access Shelf deficiency.

1. When DS1 links are busied (i.e., taken out of service by telco personnel) at the MAP terminal, there is no visual indicator at the *SuperLine* Element Manager.
2. When the Integrated Digital Terminal (IDT) is busied (i.e., taken out of service by telco personnel) at the Maintenance and Administrative Position (MAP) terminal, there is no visual indicator at the *SuperLine* Element Manager.
3. DS1 line build out (distance to cross-connect) is set up using dip switches of DS1 card. Refer to section SMA2 11–101 of the *Nortel NTMX81 User's Guide* for dip switch settings.
4. Unique pad group (–6 dB loss) can be assigned to *SuperLine* derived lines using RC pad group table.
5. For *SuperLine* Access Shelf event reports, logutil terminal is used.
6. Far-end DS1 loopback is not supported by the *DMS* switch.
7. In the TR-303 configuration, system time and date updates are not supported by the *DMS* switch.

Installation location

SuperLine Access System equipment is intended to be installed in a restricted access location, such as a dedicated equipment room, equipment closet, or similar area controlled by authorized personnel responsible for the location. Access should be limited to trained service personnel in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.

Installation sequence

The following table identifies the procedures required to install the *SuperLine* Access Shelf and SPFM assembly at the central office and to make the cabling connections to External Facilities and CO Equipment terminal blocks. Procedures 1 through 16 can be performed without actual *SuperLine* customers.

Several of the procedures refer you to the *SuperLine Access System Element Manager User's Guide*. It is advisable to read this guide before beginning shelf and SPFM installation.

Procedure	Description
1	Prepare to support the *SuperLine* Access Shelf in a local digital switch
2	Ground shelf equipment
3	Connect system power
4	Cable the SPFM to the shelf
5	Cable the SPFM to CO Equipment and External Facilities terminal blocks
6	Cable the alarms
7	Install and cable the VDS1 and FETH cards
8	Discover the shelf's IP address and establish the Element Manager connection
9	Provision system information
10	Provision the telephony type and voice DS1s
11	Connect shelf DS1s at the DSX panel
12	Cross-connect the DS1s at the DSX panel
13	Install QV8 cards
14	Verify derived line operations at the CO before deployment
15	Connect the CO POTS line and CO *SuperLine* IAD to new terminal blocks
16	Test CO baseband voice and derived lines at the local digital switch
17	Cut over subscriber baseband voice and derived lines at the local digital switch

□

Installation safety information

Precautions

CAUTION

Electric shock hazard

To avoid exposure to a possible electric shock hazard, first connect the green-yellow chassis ground wire on the SuperLine Access Shelf to a reliable earth ground, then connect the telecommunication cables or power/return wires.

CAUTION

Electric shock hazard

The SuperLine Access Shelf is supplied by two (redundant) power feeds. To reduce the risk of electric shock or electric energy-high current levels, disconnect both sources of power before installing.

Important: The ports listed below are not intended to meet surge requirements for outside plant interfaces per Telecordia Technologies Inc. (Bellcore) GR-1089-CORE, Section 4.5.9 [31]. These ports may only connect to intrabuilding wiring:

- *SuperLine* Access Shelf telecom ports that connect to the SPFM
- VDS1 card Craft 10Base-T Port C
- VDS1 card DS1 Ports 1–4
- POWR card Miscellaneous alarm connector
- FETH card 10/100Base-T Ports A and B

CAUTION
Equipment damage hazard

SuperLine Access Shelf equipment must be installed only by qualified personnel in accordance with instructions provided in or referenced by this guide. Failure to properly install the equipment can result in damage to the equipment, degraded service, or both. Before installation, read the following safety precautions:

- Connect the green-yellow chassis ground wire to the frame ground in the cable runway. The chassis ground is necessary to operate the equipment properly, and it conducts surge currents away from the shelf equipment. Failure to connect the chassis ground to a reliable earth ground can result in damage to the equipment.
- Make sure the green-yellow chassis ground wire is three to four inches longer than the other wires coming out of the wire bundles between the strain relief tiedown and the connection point on the equipment shelf. This precaution ensures that the chassis ground is the LAST wire connected if the wire bundle is accidentally pulled from its connections.
- The *SuperLine* Access Shelf is intended to be used with primary protection from lightning and power cross provided in the central office Main Distribution Frame (MDF) or equivalent.
- If the *SuperLine* Access Shelf VDS1 card is connected to a distant central office using outside plant T1 spans, the spans must be connected to a local repeater or a fiber multiplexer. The repeater/multiplexer shall be placed between the card and the outside demarcation in order to protect the shelf equipment.
- When the *SuperLine* Access Shelf is installed in a rack with other equipment, it must be installed with a thermal baffle or equivalent in place above and below the shelf.
- Before working with the shelf cards, attach an antistatic wrist strap and ground yourself to the equipment ground window. The electrostatic discharge (ESD) socket on the shelf baffle provides this grounding requirement. Electrostatic discharge can damage or destroy electronic components.
- Be aware of the sharp edges of the shelf cards when handling them.
- Use caution when installing or modifying telephone lines.

For information on reducing the risk of fire and taking other safety precautions around *SuperLine* Access System equipment, refer to the **Safety precautions** subtopic in the About this information product chapter.

□

Preparing to support the *SuperLine* Access Shelf in a local digital switch

Procedure

The following procedure provides the steps necessary in preparing a local digital switch (LDS) to support the integration of the *SuperLine* Access Shelf. Examples of system commands and results are given for purposes of illustration.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>If the SuperLine Access Shelf will be directly connected to the LDS, check the DS1 line build-out or DS1 straps for line build-out for those DS1s that will be assigned to the SuperLine Access Shelf. This information will be needed during SuperLine Element Manager telephony configuration of the SuperLine Access Shelf.
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>at the Input/Output Maintenance (IOM) terminal, type (example):
EXAM FIU.TCU<#>.<FIU#>
Sample Result:
EXMO314 JOB 0128 05/27/99
P17D41 0515
FIU.TCU003.0 CUT EDTF
DSX300 DFL.TCU03.0.0
ECON=C1T1
The field DSX300 provides the DS1s line build-out in feet; in this example, DS1s line build-out is 300 ft.</td></tr>
<tr><td>5ESS</td><td>a. at the Remote Trunk Line workstation, use the Recent Change poke 19.12 to check the DS1s line build-out
b. check fields 19 and 28 for cable distance. (Cable distance in feet represents the DS1s line build-out.)</td></tr>
<tr><td>DMS</td><td>check the DS1 strap of associated DS1 cards using the Distance to cross-connect table at the end of this topic.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>2</td><td>Depending on the switch and the telephony type, create the following if they do not exist:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN CREATE ...</th></tr>
<tr><td>GTD-5 EAX/
DDI or TR-303</td><td>• Extended Superframe Digital Trunk-Facility Interface Unit (EDT-FIU)
• Peripheral Interface Unit (PIU)
Important: With the TR-303 application, ensure that the IROC exists, and that the database for the Integrated Digital Line Carrier (IDLC)-type Remote Line Unit (RLU) with line size equal to 192 has been engineered. Refer to the following GTD-5 EAX User's Guide sections:
• Part 2—EDT-FIU Addition to a Base Unit of the FIU Growth Procedures chapter for hardware growth.
• Part 2—Make RLU command.
• Part 13—Command Fields and Notes for <code>Make FIU</code> and <code>Make PIU</code> commands (DDI and TR-303).</td></tr>
<tr><td>5ESS</td><td>• TR-303—IDCU
• TR-008 Mode 1—IDCU or DCLU
Important: At the Recent Change Terminal,
a. check that the Remote Digital Terminal (RDT) exists using poke 18.15 Review</td></tr>
</table></td></tr>
</table>

Step	Action	
2 cont'd	**IF SWITCH IS ...**	**THEN CREATE ...**

	5ESS	Important, cont'd
		b. for TR-303 only, ensure the following:
		`RT LINE SIZE = 192`
		`PROT LINE = N`
		`EOC/TMC BKUP RT TERM = 2`
		c. for both TR-303 and TR-008 Mode 1, ensure that circuit test method is set to None
		d. check the IFAC's supervision method using poke 20.23
		Example: Supervision method 303B8 for TR-303 and TR8ZC for TR-008 Mode 1.

Step	Action	

2 cont'd	*DMS*	• TR-303—SMA2
		• TR-008 Mode 1—SMS
		Important: Using the MAP terminal,
		a. make sure the datafill tables RDTINV (TR-303) or RCSINV (TR-008 Mode 1), LTCPSINV, CLLI, and SITE exist for the respective application
		b. for the TR-303 application only, verify the following important fields in the table RDTINV:
		`RDTPPLNK = 2 (STANDBY EOC/ TMC DATALINKS ON SECOND DS1)`
		`MAXLINES = 192`
		`INHLINE = N (LINE INSTANCES ARE CREATED BY DMS)`
		`LINKTAB` (EXAMPLE):
		`SUPERLINE DS1 LOGICAL LINKS`
		`1 (ACTIVE DATA LINKS)`
		`2 (STBY DATALINKS)`
		`3`
		`4`
		`XPMLINK (0 TO 53)`
		`0 (ACTIVE DATA LINKS)`
		`1 (STBY DATALINKS)`
		`2`
		`3`
		`PROT = N (NO PROTECTION DS1)`
		`RDTVAR = GENTMC`
		`EOCTYPE = S`
		`MTSTACPT = $ (NO LINE TESTING)`
		`NETWORK ID = 1`
		For detailed information, refer to the *DMS User's Guide* for TR-008 Mode 1 RDT and TR-303 RDT datafills.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Check the cutover status of the local digital switch's FIU, PIU, and RLU:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX/ DDI and TR-303</td><td>at the Input/Output Maintenance (IOM) terminal, type (example):
EXAM FIU.TCU0.0
Sample FIU Result: FIU.TCU0.0 CUT EDTF DFL.TCU0.0.0 DSX015 ECON=C1T1
EXAM PIU.TCU0.0.0
Sample PIU Result for DDI: PIU.TCU0.0.0 CUT DEFB ZON1 APPL=DDI PRM=XMIT NWI LLBK GOS01 NNLB NPLB
Sample PIU Result for TR-303 Spans 1–2: PIU.TCU0.0.0 CUT DEFB ZON1 APPL=RTDL PRM=XMIT NWI LLBK GOS01 NNLB NPLB
Sample PIU Result for TR-303 Spans 3–4: PIU.TCU0.0.0 CUT DEFB ZON1 APPL=RTVL PRM=XMIT NWI LLBK GOS01 NNLB NPLB</td></tr>
<tr><td>GTD-5 EAX/ TR-303 only</td><td>at the IOM terminal, type (example):
EXAM RLU63
Sample RLU Result: RLU063 CUT IDLC SUPR.TCU03 TDAU06 SIZE=0192
LOC='SL RLU63' RLSE.001 PROV LEOC TEST PMAL SCUA MSGS=004
GPTV.T303=40.T305=40.T308= 40.T313=40.T322=20 RTTV.T303=0700
SAP0.MIFR=7.N200=06.T200= 350.T203=030
SAP1.MIFR=7.N200=06.T200= 350.T203=030 TCA</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3
cont'd</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>5ESS</td><td>a. at the Remote Trunk Line workstation, use one of the following pokes depending on telephony type:
• TR-303 and TR-008 Mode 1—
186<IDCU#>,<IDCU#>,<SM#>
• TR-008 Mode 1—
115<DCLU#>,<DCLU#>,<SM#>
b. make sure the IDCU/DCLU service groups 0 and 1 are active and standby.</td></tr>
<tr><td>DMS</td><td>at the MAP terminal, check that SMA2 (for TR-303) or SMS (for TR-008 Mode 1) is in service (InSV) using the following poke based on telephony type:
• TR-303—
MAPCI;MTC;PM;POST SMA2 #
• TR-008 Mode 1—
MAPCI;MTC;PM;POST SMS #</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Important: If the DS1 spans are already looped at the DSX panel toward the LDS, skip this step and go to the next step.
Check the status of the DCXR (Digital Carrier Span) and associated spans (GTD-5 EAX only)/IFACs (IDCU facilities)/DS1 datalinks:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>at the IOM terminal, type (example):
DUMP STAT DCXR.TCU0.0.0
Result: Status for all DCXRs is INS (in service).
DUMP STAT SPAN.TCU0.0.0
Result: Status for all spans is OOS (out of service).</td></tr>
<tr><td>5ESS</td><td>at the Remote Trunk Line workstation, use the following poke depending on telephony type:
• TR-303 and TR-008 Mode 1—
187<IDCU#>,<IDCU#>,<SM#>
• TR-008 Mode 1—
116<DCLU#>,<DCLU#>,<SM#>
Result: Status for all IFACs is OOS (out of service).</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4
cont'd</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>DMS
• TR-303</td><td>using the MAP terminal, check that the status of DS1 links is out of service (SysB) by typing the following pokes:
MAPCI;MTC;PM;POST SMA2 #
TRANSL P
Result: System responds with
DS1 P–links status SysB
TRANSL C
Result: System responds with
DS1 C–links status OK</td></tr>
<tr><td>• TR-008 Mode 1</td><td>using the MAP terminal,
a. post the SMS number by using the following poke:
MAPCI;MTC;PM;POST SMS #
b. check the status of DS1 links and RT alarms by using the following poke:
QUERYPM FLT
c. check that there are major A, B, C, and D shelf alarms.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>5</td><td>
a. Verify that the LDS spans/IFACs DS1 Transmit signal leads are wired to the DSX OUT jacks, and that the DS1 Receive signal leads are wired to the DSX IN jacks.
b. If the LDS spans/IFACs are not looped toward the LDS at the DSX panel, loop them back now.
c. Verify that these spans/IFACs are in service.
d. Be guided by the following remarks based on switch:
<table>
<tr><th>Switch</th><th>Remarks</th></tr>
<tr><td>GTD-5 EAX</td><td>1. If necessary, force the spans INS by typing (example):
FORCE INS
SPAN.TCU#.FIU#.PIU#
2. In the TR-303 mode, data links (EOC/TMC) will be OOS.</td></tr>
<tr><td>5ESS</td><td>1. If necessary, restore the IFACs INS by typing (example):
RST:IFAC=SM#-IDCU#-FAC#,UCL
2. In the TR-303 mode, use the following poke:
1880,<IDCU#>,<RT#>
Result: Data links (EOC/TMC) will be OOS.</td></tr>
<tr><td>DMS</td><td>1. In the TR-003 mode, check that the status of DS1 links is OK by using the following poke:
MAPCI;MTC;PM;POST IDT #
If necessary, force the DS1 link to in service (OK) by using the following poke:
RTS LINK #
2. In the TR-008 Mode 1, check that the status of DS1 links is OK by using the following poke:
MAPCI;MTC;PM;POST SMS #
If necessary, force the DS1 link to in service (OK) by using the following poke:
RTS LINK #
3. In the TR-303 mode, EOC/TMC data links will be out of service. To verify this, use the following poke:
PPS QUERY</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6</td><td>Optional: Monitor the hourly and daily PM data of the spans/IFACs/DS1 links as follows.
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>Important: GTD-5 EAX users should refer to the Hourly Span Performance Detail Report and the Daily Span Performance Detail Report in Part 8 of the GTD-5 EAX User's Guide.
a. at the IOM terminal, type (examples):
REPO MRG SYSTEM CURR HS TCU0.0.0
REPO MRG SYSTEM CURR DS TCU0.0.0
b. verify that there are no errors.</td></tr>
<tr><td>5ESS</td><td>a. at the Remote Trunk Line workstation, use the following poke for all equipped spans depending on telephony type:
• TR-303 and TR-008 Mode 1—OP:FAC,IFAC=<SM#>-<IDCU#>-<IFAC#>, HIST,NE
• TR-008 Mode 1—OP:FAC,IFAC=<SM#>-<DCLU#>-<IFAC#>, HIST,NE
b. verify that there are no errors.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6
cont’d</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>DMS
• TR-303</td><td>at the MAP terminal,
a. use OMSHOW level to get the DS1 Performance Monitoring results for DS1 links.
b. post the SMA2 by using the the following MAP terminal poke: MAPCI;MTC;PM;POST SMA2 #
c. check that there are no errors in each DS1 link by using the following poke (example): OMSHOW DS1 CARR HOLDING ’HOST SMA2 #
X C
where X = DS1 link number
Result: System returns results for last 30 minutes.</td></tr>
<tr><td>• TR-008 Mode 1</td><td>at the MAP terminal,
a. use OMSHOW level to get the DS1 Performance Monitoring results for DS1 links.
b. post the SMS by using the MAP terminal poke MAPCI;MTC;PM;POST SMS #
c. check that there are no errors in each DS1 link by using the following poke (example): OMSHOW DS1 CARR HOLDING ’HOST SMS # X C
where X = DS1 link number
Result: System returns results for last 30 minutes</td></tr>
</table>
</td></tr>
</table>

Distance to cross-connect

Refer to the following table for information on correct DS1 switch settings for the *DMS* switch (step 1).

Feet	**Meters**	**S3/6** a.	**S2/5**	**S1/4**
0–133	0–41	On	Off	Off
133–266	41–81	Off	On	On
266–399	81–122	Off	On	Off
399–533	122–163	Off	Off	On
533–655	163–200	Off	Off	Off

a. S indicates switch number(s). On D1 dip switch (6 position): S1–S3 belong to even port, and S4–S6 belong to odd port.

□

Grounding shelf equipment in a local digital switch frame lineup

Introduction

This procedure describes grounding equipment in a local digital switch frame lineup. It covers the following activities:

- Connecting the *SuperLine* Access Shelf chassis ground to the ground frame cable in the cable runway.
- Connecting the SPFM chassis ground to the frame ground cable in the cable runway.
- Connecting the SPFM protection ground to the line protection ground in the cable runway.

Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for shelf and SPFM cable part numbers.

CAUTION

Equipment damage hazard

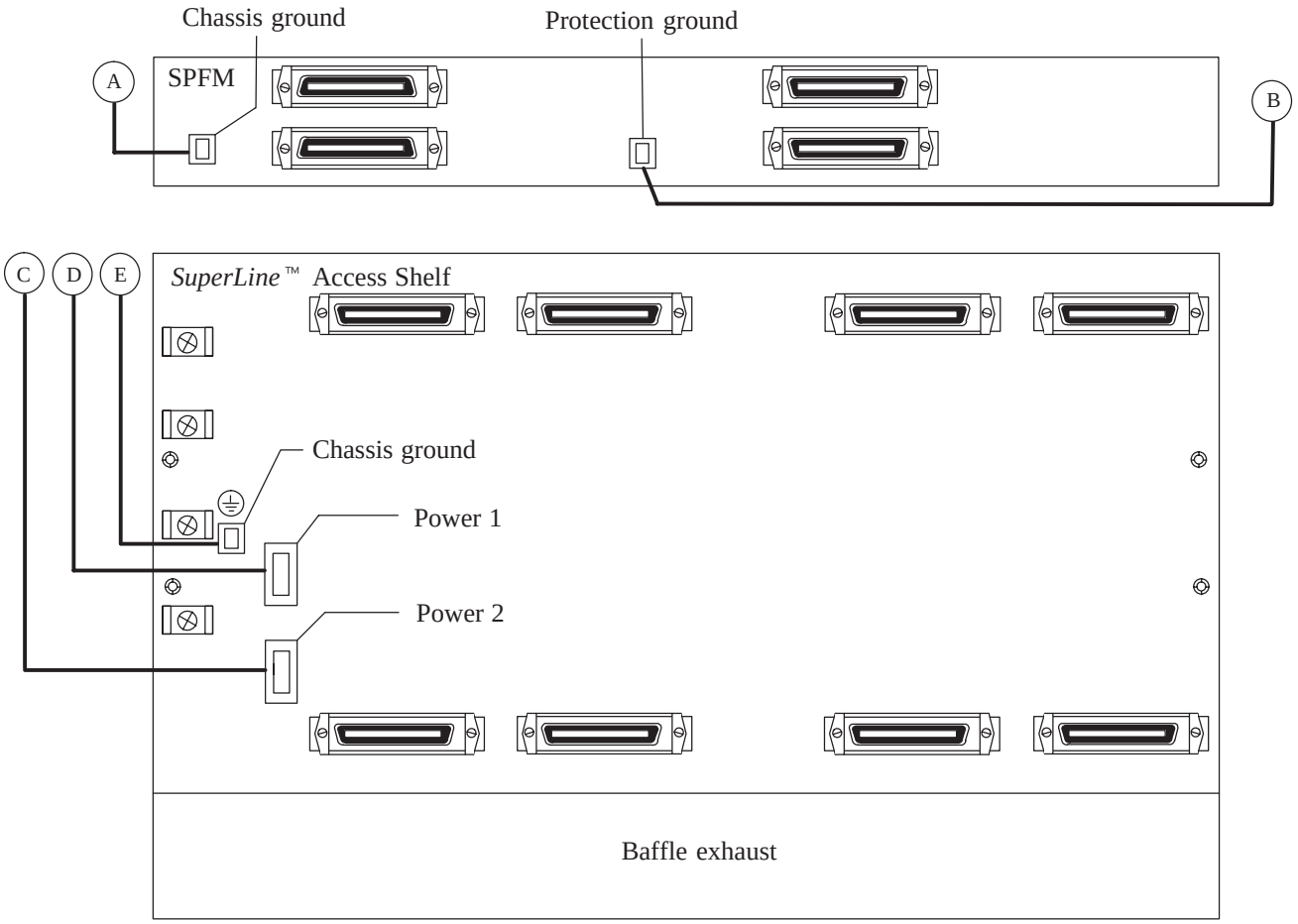
Connect the 10 AWG green-yellow chassis ground wires and the protection ground wire on this equipment to a reliable earth ground. The chassis ground wires and the protection ground wire are necessary to operate the equipment properly, and they conduct surge currents away from the equipment. Failure to connect the chassis ground and protection ground wires to a reliable earth ground can result in damage to the equipment.

Shelf and SPFM grounding connections

On the rear of the *SuperLine* Access Shelf are connectors for –48V DC, battery return, and chassis ground. The *SuperLine* POTS Filter Module has chassis and protection ground connectors.

Zone locations are given in the figure to assist those installing cables through a *GTD-5* EAX switch area. Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones.

Where the *SuperLine* Access Shelf is part of a *GTD-5* EAX frame lineup, the chassis ground is connected to the frame ground in the cable runway and protection ground is connected to the line protection ground cable in the cable runway. *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed grounding information.



LEGEND:

A. SPFM chassis ground to frame ground (FG) or earth ground, Zone 0, in cable runway
B. SPFM protection ground to line protection ground (LPG), Zone 0, in cable runway
C. Shelf backplane power feed 2 to second Main Battery (MB) and Main Battery Return (MBR), Zone 0—fuse to accommodate 320 watts per shelf
D. Shelf backplane power feed 1 to first MB and MBR, Zone 0—fuse to accommodate 320 watts per shelf
E. Shelf chassis ground to FG or earth ground, Zone 0, in cable runway

Ground the shelf chassis to the frame ground cable

The green-yellow *SuperLine* Access Shelf chassis ground cable must be grounded to the frame ground cable in the cable runway.

Use the following procedure to ground the shelf chassis. See the figure **Shelf and SPFM grounding conntections** earlier in this topic for an illustration of the required connections.

Step	Action
1	Install and secure the *SuperLine* Access Shelf in the rack. Refer to the **Frame configurations** topic in the *SuperLine* Access Shelf configurations chapter for information on where *SuperLine* Access Shelves may be installed.
2	Connect the green-yellow cable to the shelf as follows: a. Place a star washer on the chassis ground stud located at the rear of the shelf. b. Place the green-yellow chassis ground cable with the ring terminal on the stud. c. Screw down the nut with the star washer side toward the ring terminal on the stud.
3	Connect the green-yellow shelf chassis ground cable to the frame ground cable in the cable runway.

Ground the SPFM chassis to the frame ground cable

The green-yellow SPFM chassis ground cable must be grounded to the frame ground cable in the cable runway. The SPFM chassis ground cable may be preinstalled in the rear of the SPFM assembly.

Use the following procedure to ground the SPFM chassis. See the figure **Shelf and SPFM grounding conntections** earlier in this topic for an illustration of the required connections.

Step	Action
1	Install and secure the SPFM assembly in the rack. Refer to the **Frame configurations** topic in the *SuperLine* Access Shelf configurations chapter for information on where SPFMs may be installed.
2	If the green-yellow SPFM chassis ground cable is not preinstalled, do the following: a. Place a star washer on the chassis ground stud located at the left rear of the SPFM assembly b. Place the green-yellow chassis ground cable with the ring terminal on the stud. c. Screw down the nut with the star washer side toward the ring terminal on the stud.
3	Connect the green-yellow SPFM chassis ground cable to the frame ground cable in the cable runway.

Connect the SPFM protection ground to the line protection ground

The black SPFM protection ground cable is connected to the protection ground terminal on the rear of the SPFM. This cable is used to drain unwanted currents from lines, which may be introduced through the outside plant cable pairs.

Use the following procedure to connect the SPFM protection ground cable. See the figure **Shelf and SPFM grounding conntections** earlier in this topic for an illustration of the required connections.

CAUTION
Equipment damage hazard

Failure to properly connect the protection ground wire or ground its feeder can result in damage to the equipment.

Step	Action
1	Take one of the following actions:

IF ...	THEN ...
an existing Line Protection Ground (LPG) cable exists in the cable runway of the lineup containing the shelf,	connect the SPFM protection ground cable to the LPG cable.
a Line Protection Ground (LPG) cable does not exist,	install an LPG cable in the cable runway and connect the SPFM protection ground cable to the LPG cable in the cable runway. This cable originates from the Master/Main/Floor ground bar. Important: Refer to the Equipment Power Distribution and Grounding (EPDG) document supplied by AG Communication Systems Engineering for installation details.

□

Connecting system power

Introduction

The *SuperLine* Access Shelf is powered by a pair of two-wire shelf backplane power cable assemblies for power redundancy. These power connections are made at the rear of the shelf. The open ends of the power cables are connected to telco power feeders. To ensure power redundancy, power to the shelf should be fed by two separately fused power sources.

Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for the part number of the shelf backplane power feed assembly.

CAUTION

Equipment damage hazard

To avoid personal injury or damage to the equipment, ensure that the Power switch on the POWR card is in the Off position, and that the –48V DC power source is not connected to the SuperLine Access Shelf. Follow all precautions for working with live power.

CAUTION

Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

Connect power to the shelf

Use the following procedure to make power connections to the *SuperLine* Access Shelf. As necessary, refer to the figures ***SuperLine* Access Shelf rear power connections** and **POWR card** later in this topic for assistance in connecting system power.

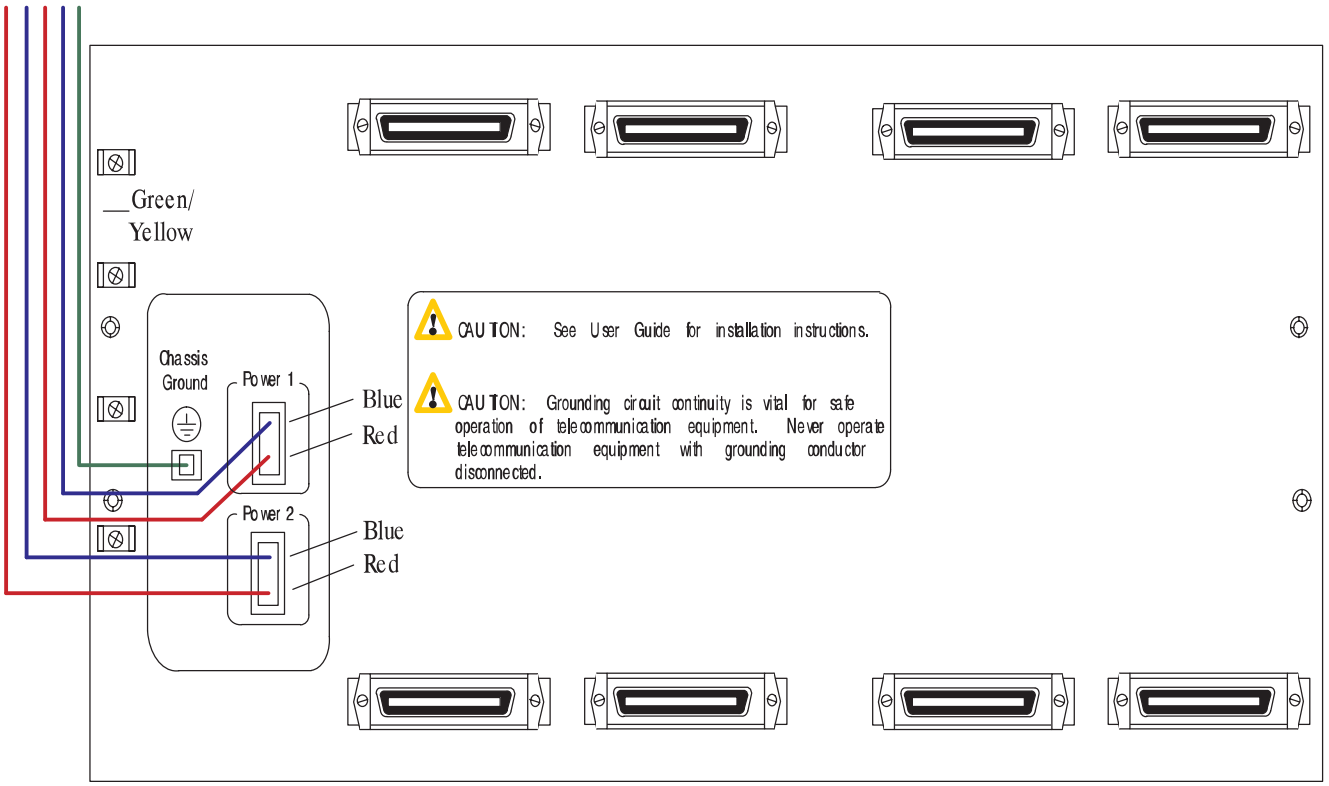
Step	Action
1	Read and observe the preceding cautionary messages concerning equipment and ESD damage hazards.
2	Unseat all cards in the *SuperLine* Access Shelf if they are pre-installed.
3	Before connecting power to the *SuperLine* Access Shelf, remove the feeder fuses from the two –48V DC power sources.

Step	Action
4	Connect the following wires in the shelf backplane power cable assembly to the power source: a. Blue wires to the two separate –48V DC power sources b. Red wires to –48V DC ground
5	After the power connections are made, re-energize the two power sources serving the *SuperLine* Access Shelf by installing a 12A fuse for each power source.
6	Verify the voltage of the DC power sources are between –42V and –56V DC as follows: a. Connect the voltmeter black probe (common terminal) to the red wire pin of power connector 1 and the red probe (volts terminal) to the blue wire pin of power connector 1. b. Using voltmeter probes, verify at the connector end (Power 1) that the voltage is between –42V and –56V DC. c. Connect the voltmeter black probe (common terminal) to the red wire pin of power connector 2 and the red probe (volts terminal) to the blue wire pin of power connector 2. d. Using voltmeter probes, verify at the connector end (Power 2) that the voltage is between –42V and –56V DC. e. If voltage is not within the threshold, refer to Appendix D, **Fault clearing**, for troubleshooting information.
7	Plug one power cable into the Power 1 connector at the rear of the shelf.
8	Seat/install the POWR card as follows: a. Move the rocker power switch on the POWR card to the Off position. b. Using the handles, seat/insert the POWR card into the shelf until the card is flush with the shelf. c. Tighten the upper and lower screws on the POWR card to secure the card in place.
9	Turn on power to the shelf by pressing the rocker power switch to the On position on the POWR card. Result: All LEDs on the POWR card except for the Fail LED light through initialization while the card runs diagnostic routines. When initialization is complete, the green Power LED remains lighted, the red Fail LED unlighted. The Major and Minor shelf alarm LEDs also remain lighted due to the absence of the VDS1 card. If your results are not the same as these, refer to Appendix D, **Fault clearing**, for troubleshooting information.
10	Move the rocker power switch on the POWR card to the Off position.
11	Remove Power 1 connector at the rear of the shelf.

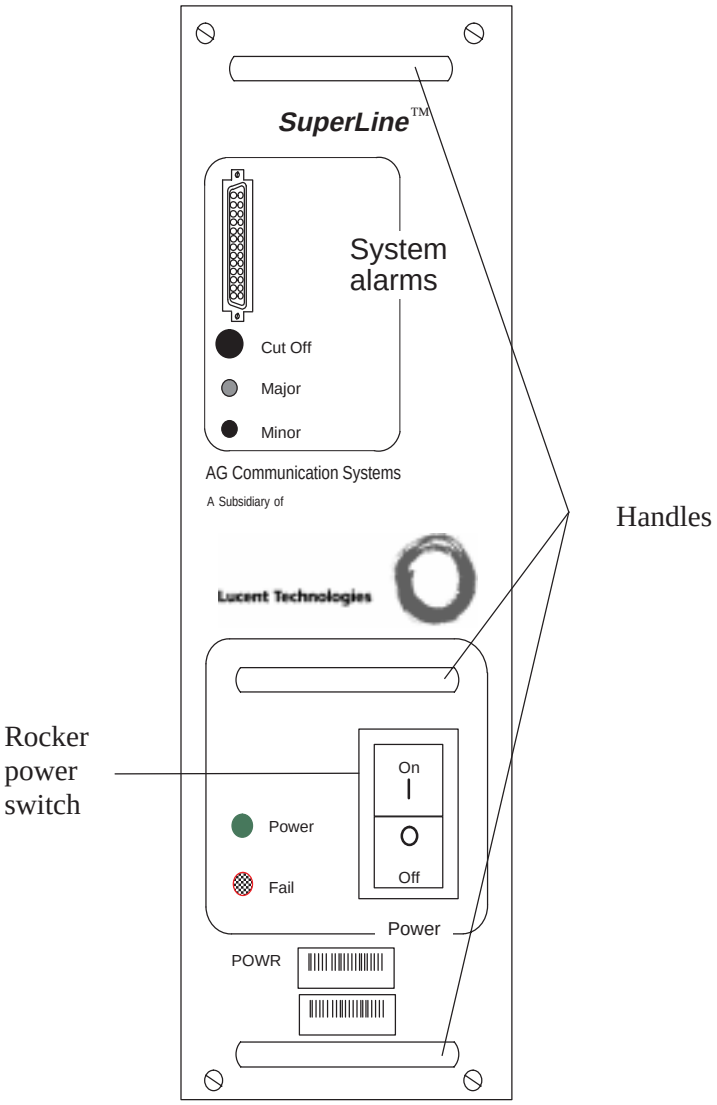
Step	Action
12	Plug the second power cable into the Power 2 connector at the rear of the shelf.
13	Repeat step 9 and verify results.
14	Move the rocker power switch on the POWR card to the Off position.
15	Restore Power 1 connector at the rear of the shelf.
16	Restore power to the POWR card by moving the rocker power switch to the On position. Result: All LEDs on the POWR card light through initialization while the card runs diagnostic routines. When initialization is complete, the green Power LED remains lighted, the red Fail LED unlighted. The Major and Minor shelf alarm LEDs also remain lighted due to the absence of the VDS1 card. If your results are not the same as these, refer to Appendix D, **Fault clearing**, for troubleshooting information.
17	Move the rocker power switch on the POWR card to the Off position.

SuperLine Access Shelf rear power connections

The shelf backplane power feed cables connect the shelf to the power source.



POWR card Before seating or installing the POWR card, press the rocker switch on the POWR card to the Off position.



□

Cabling the SPFM to the shelf

Cable the SPFM to the shelf

SuperLine Access Shelf lines are connected to the rear of the SPFM by four cables with telco connectors. Use the following procedure to cable the shelf to the SPFM. As necessary, see the figure **Rear shelf and SPFM connections** for an illustration of the shelf-to-SPFM cabling. Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for the rear SPFM cable part numbers.

Important: *GTD-5* EAX users should route cables through Zone 1. (Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones.) *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

CAUTION

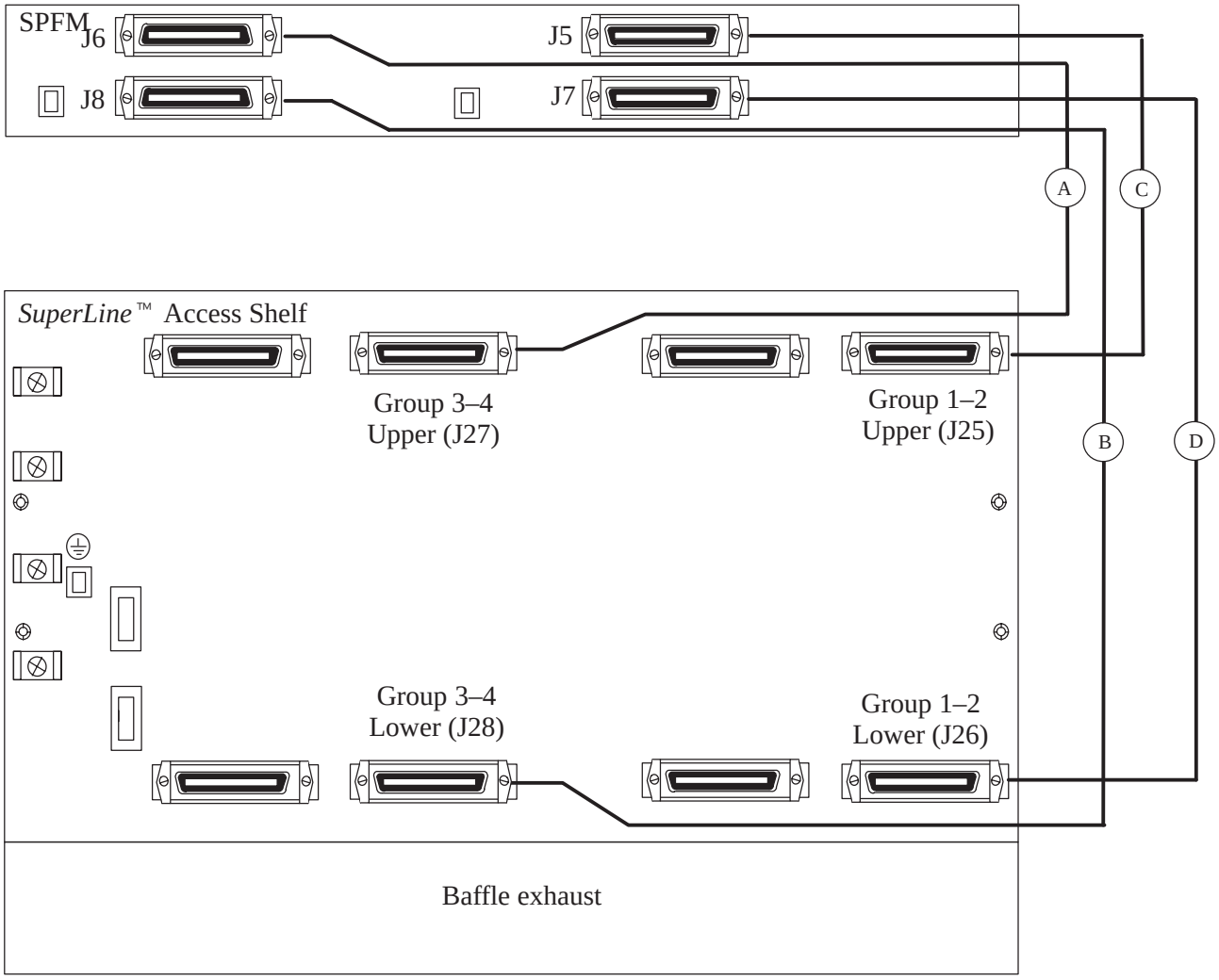
Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Route the cables from the rear of the *SuperLine* Access Shelf to the rear of the SPFM as follows: a. Shelf J27 to SPFM J6 b. Shelf J28 to SPFM J8 c. Shelf J25 to SPFM J5 d. Shelf J26 to SPFM J7
3	Attach and secure the connectors to the devices using the screw in the connector-end opposite the cable and with one cable tie supplied with the *SuperLine* Access System equipment.

Rear shelf and SPFM connections

The following figure shows how the *SuperLine* Access Shelf is cabled to the SPFM. For tip and ring diagrams, refer to Appendix B, **SPFM rear panel pin assignments**.



LEGEND:

A. Shelf J27 to SPFM J6
B. Shelf J28 to SPFM J8
C. Shelf J25 to SPFM J5
D. Shelf J26 to SPFM J7

Cabling the SPFM to CO Equipment and External Facilities terminal blocks

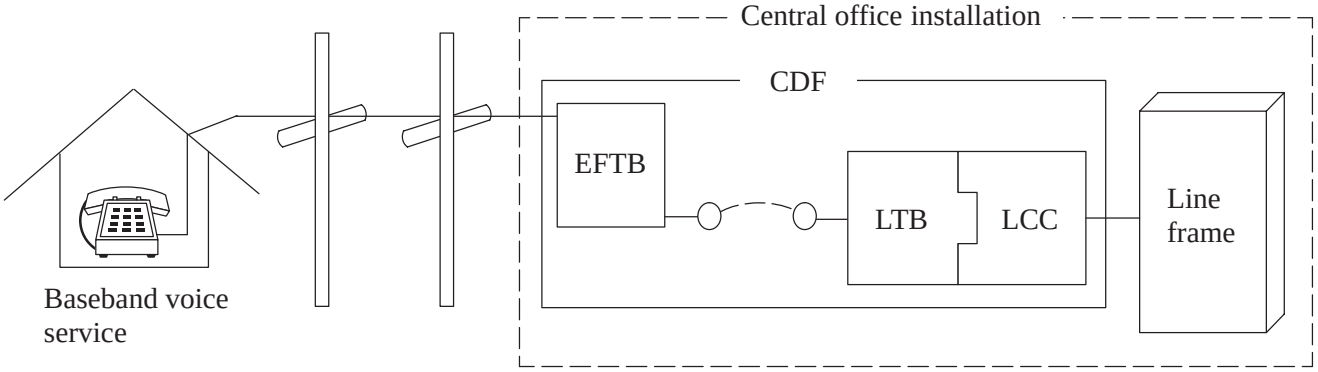
Distributing frame terminal block connections

Two additional terminal blocks per shelf are required on the combined distributing frame (CDF) for cross-connecting the *SuperLine* POTS Filter Module to the outside plant pairs and the CO Equipment tip and ring pairs. By using the SPFM, CO Equipment lines from any line bay or frame can be delivered to customers with *SuperLine* capabilities; i.e., two derived lines and Ethernet.

The succeeding figures, **Cabling diagram without *SuperLine* Access System equipment** and **Cabling diagram with *SuperLine* Access System equipment**, show the central office before and after the installation of the *SuperLine* Access System.

Cabling diagram without *SuperLine* Access System equipment

The following diagram shows a typical baseband installation without the *SuperLine* Access Shelf and SPFM.

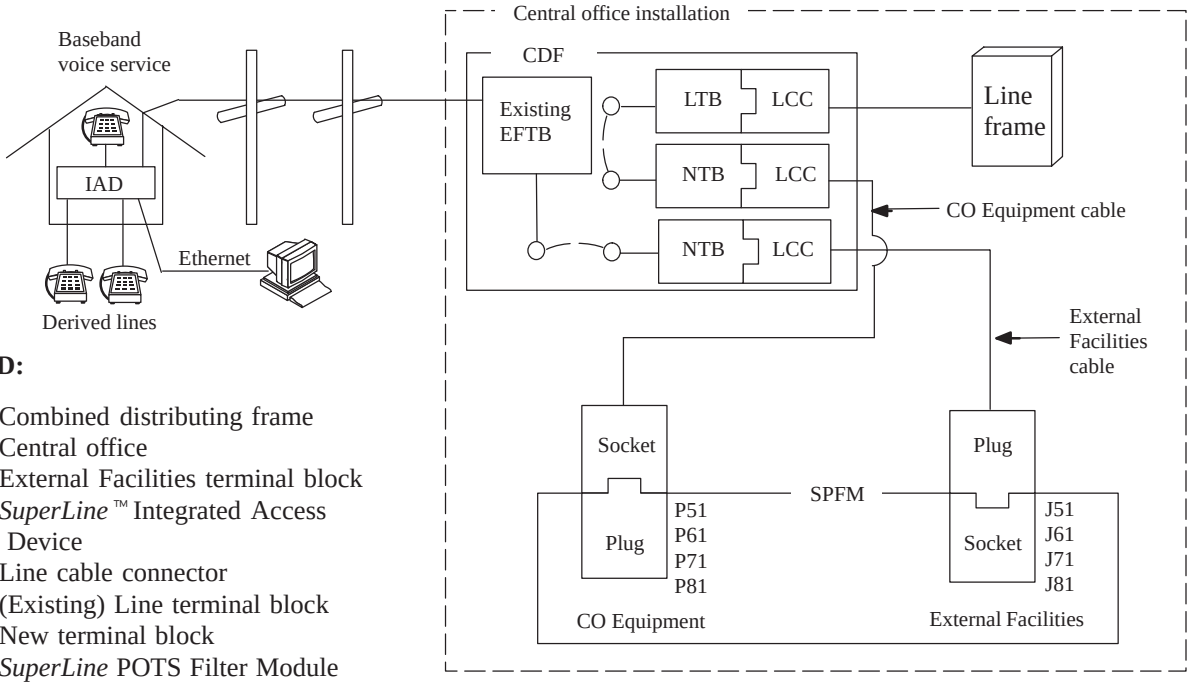


LEGEND:

CDF	Combined distributing frame
EFTB	External Facilities terminal block
LCC	Line cable connector
LTB	Line terminal block
	Cross-connect

Cabling diagram with *SuperLine* Access System equipment

Typical method for connecting the SPFM to the new External Facilities and the new CO Equipment terminal blocks via distributing frame cross-connects.



LEGEND:

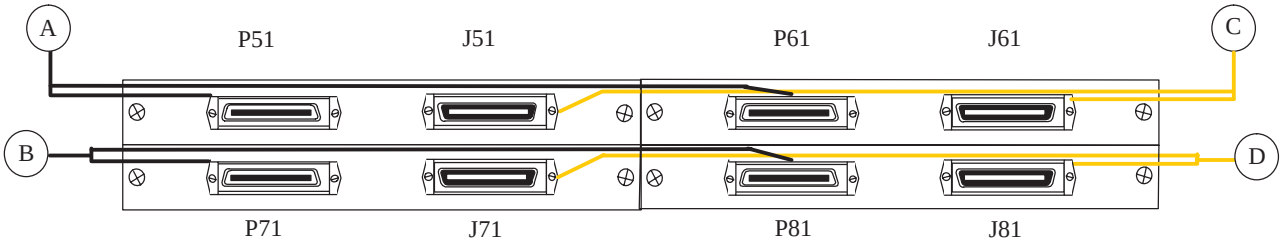
CDF	Combined distributing frame
CO	Central office
EFTB	External Facilities terminal block
IAD	*SuperLine* ™ Integrated Access Device
LCC	Line cable connector
LTB	(Existing) Line terminal block
NTB	New terminal block
SPFM	*SuperLine* POTS Filter Module
○—○	Cross-connect

CO Equipment and External Facilities cabling

CO Equipment and External Facilities connectors are located on the front panel of the *SuperLine* POTS Filter Module. Wiring connections follow standard communications industry practices for using 50-pin conductor cable with telco connectors.

SPFM front connections

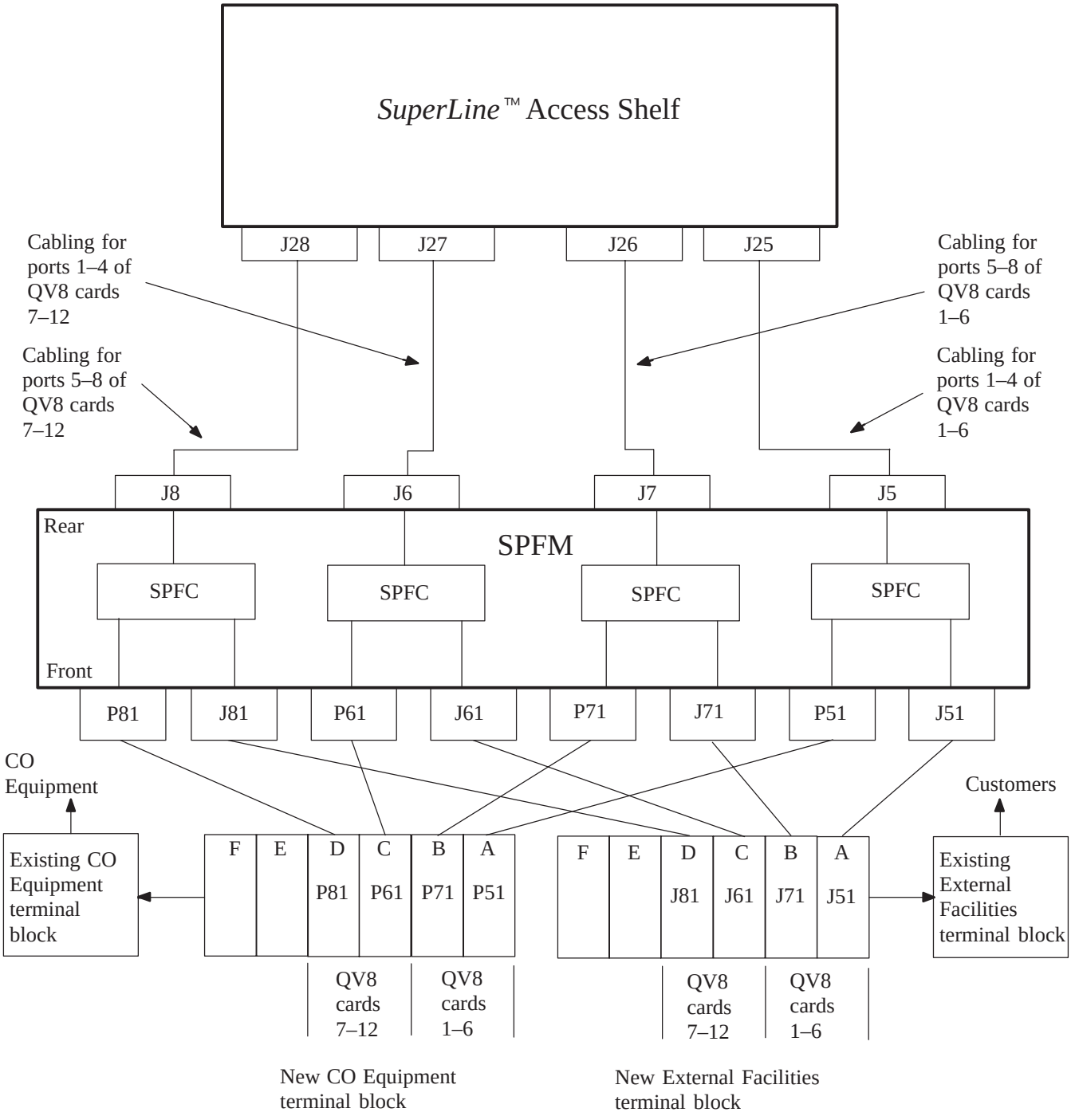
The following figure depicts SPFM cable connector designations. Refer to Appendix A, **SPFM front panel pin assignments**, for a representation of tip and ring assignments by line card.



LEGEND:
A. SPFM P51 and P61 CO Equipment connectors to CO Equipment cable
B. SPFM P71 and P81 CO Equipment connectors to CO Equipment cable
C. SPFM J51 and J61 External Facility connectors to External Facilities cable
D. SPFM J71 and J81 External Facility connectors to External Facilities cable

System cabling

The following figure is a system overview of the cabling that ties the rear of the *SuperLine* Access Shelf and the SPFM to new terminal blocks, which then are cross-connected to the existing terminal blocks.



Procedure Use the following procedure to connect the SPFM to the CO Equipment and the External Facilities terminal blocks.

WARNING

Electric shock and equipment damage hazard

Handling CO Equipment and External Facilities cables can expose you to dangerous voltages or other risks. Users need to provide electrical environmental protection for lightning and power cross using 3-mil carbon protectors or better.

Important:

1. CO Equipment cables and External Facilities cables can be ordered as an option from AG Communication Systems. Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for the part numbers of the front SPFM cables.
2. The far end of the cables connect to terminal blocks at the distributing frame. Two standard 8 x 24 blocks are required per shelf. One block is used for the CO Equipment tip and ring pairs, and the second block is used for the External Facilities tip and ring pairs.
3. If the CO Equipment and the External Facilities cables run through a *GTD-5* EAX switch area, run them in Zone 1. *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

Step	Action
1	Prepare a terminal block layout showing how *SuperLine* cables are terminated. See the figure **Cabling diagram with *SuperLine* Access System equipment** earlier in this topic for an example. Important: The equipment terminal block layout varies depending on the type of terminal block used.
2	a. Run the CO Equipment cables from connectors on the SPFM to the CDF using the terminal block layout prepared in step 1. b. If using open-ended cables, refer to Appendix A, **SPFM front panel pin assignments**, for tip and ring assignments. If using connectorized cables, the plug (male) connector of the cable attaches to the SPFM and the socket (female) connector of the cable attaches to the CO Equipment terminal block. See the figure **Cabling diagram with *SuperLine* Access System equipment** earlier in this topic for reference.

Step	Action
3	a. Run External Facilities cables from connectors on the SPFM to the CDF using the terminal block layout prepared in step 1. b. If using open-ended cables, refer to Appendix A, **SPFM front panel pin assignments**, for tip and ring assignments. If using connectorized cables, the plug (male) connector of the cable attaches to the SPFM and the socket (female) connector of the cable attaches to the External Facilities terminal block. See the figure **Cabling diagram with *SuperLine* Access System equipment** earlier in this topic for reference.

□

Cabling the alarms

Alarm cabling

Use the following procedure to cable external alarming if required. See the accompanying figure ***SuperLine* Access Shelf alarm cable routing** for an illustration. Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for the part number of the alarm cable.

Important:

- Each alarm from the alarm sensing terminal block must use a shielded twisted pair cable, with the shield referenced to the chassis ground at the *SuperLine* Access Shelf end only.
- For alarm wiring information, refer to the figure **Power card and alarm pinouts** and the table **Alarms**, which are in the POWR card topic in the Hardware description chapter.
- If the alarm cable runs through a *GTD-5* EAX switch area (refer to step 2), run it in Zone 3. Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones. *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

CAUTION

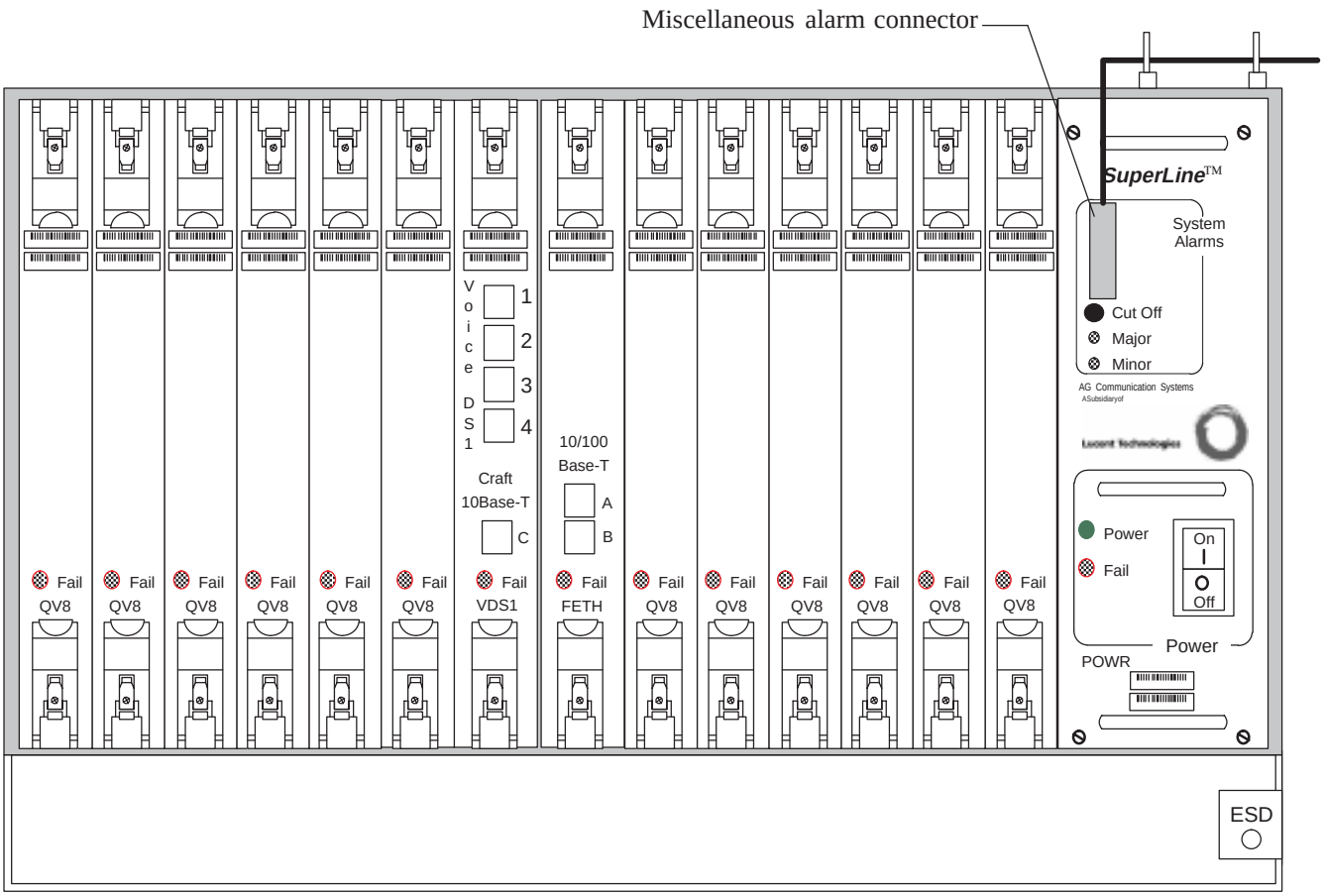
Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Run the shielded alarm cable from the Miscellaneous alarm connector on the POWR card to the customer's new or existing terminal block designated for alarm sensing.

SuperLine Access Shelf alarm cable routing

The alarm cable runs from the POWR card to the customer's equipment or terminal block designated for alarm sensing.



Installing and cabling VDS1 and FETH cards

Introduction

This following set of procedures explains how to install and cable VDS1 and FETH cards in the *SuperLine* Access Shelf. It covers the following activities:

- Installing the VDS1 and FETH cards in the *SuperLine* Access Shelf.
- Cabling the FETH card's 10/100Base-T interface to the data network.
- Cabling the VDS1 card's Craft 10Base-T interface to the *SuperLine* Element Manager (EM) interface.
- Cabling the DS1 cables to the VDS1 card.

Refer to the topic ***SuperLine* Access System equipment parts list** in the Hardware description chapter for VDS1 card and FETH card cable part numbers.

CAUTION

Equipment damage hazard

VDS1 and FETH cards are NOT hot swappable. Remove power to the shelf by pressing the rocker switch on the POWR card to the Off position BEFORE inserting the VDS1 or the FETH card into the SuperLine Access Shelf. Failure to do so can cause damage to equipment.

CAUTION

Service degradation and equipment damage hazard

If you have never installed SuperLine circuit cards in a SuperLine Access Shelf before, review the procedures in Inserting and removing shelf cards in the Adding and replacing shelf equipment chapter before attempting to install VDS1 and FETH cards. Failure to properly install SuperLine Access Shelf equipment could result in degraded service to customers, damage to CO equipment, or both.

CAUTION

Bodily injury hazard

Avoid pulling or pushing bare hands on sharp metal edges when handling circuit cards. Failure to take adequate care when installing or removing circuit cards can result in bodily injury.

CAUTION

Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

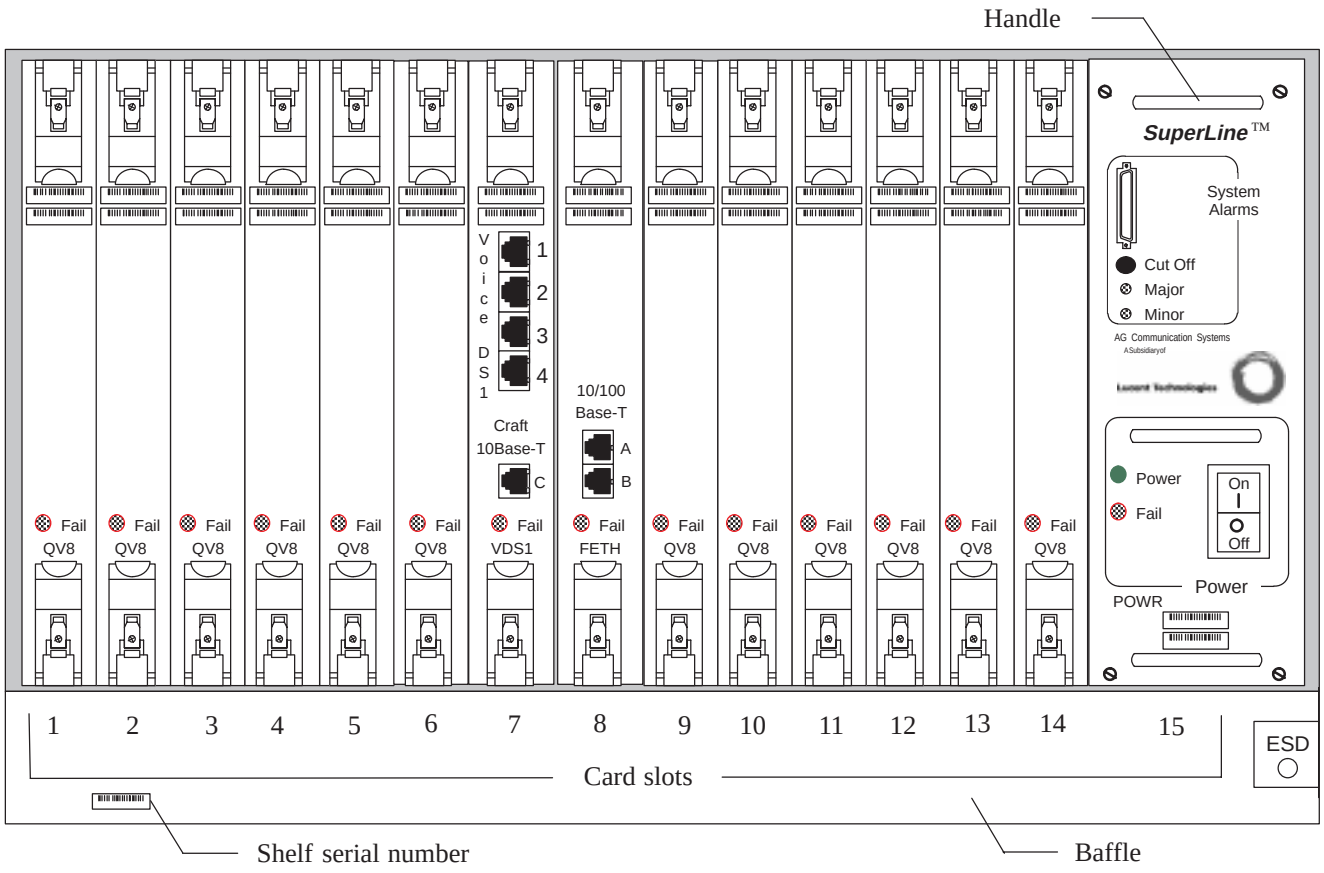
Installing the VDS1 and FETH cards

Use the following procedure to install the VDS1 and FETH cards in the *SuperLine* Access Shelf module. As necessary, see the figure **Fully equipped *SuperLine* Access Shelf** in this topic for an illustration of card placement.

Step	Action
1	Read and observe the preceding cautionary messages concerning equipment and ESD damage hazards.
2	Attach an antistatic wrist strap and ground yourself to the ESD socket.
3	Ensure that the rocker switch on the POWR card is in the Off position.
4	Insert and secure (latch) the VDS1 card in card slot 7 of the *SuperLine* Access Shelf.
5	Insert and secure (latch) the FETH card in card slot 8 of the *SuperLine* Access Shelf.
6	Press the rocker switch on the POWR card to the On position. Results: • The *SuperLine* Access Shelf module is energized. • The FETH and VDS1 cards initialize. The Fail LEDs on both cards light and remain lighted during initialization. Both Fail LEDs are extinguished within 1 to 4 minutes. On the VDS1 card, the red Local alarm and the yellow Remote alarm LEDs are also lighted during VDS1 card initialization and are extinguished when initialization completes.
7	a. Monitor the FETH and VDS1 Fail LEDs for 5 minutes to ensure that their LEDs are extinguished. b. If any Fail LEDs are still lighted, refer to Appendix D, **Fault clearing**, for troubleshooting information.

Fully equipped *SuperLine* Access Shelf

A fully equipped *SuperLine* Access Shelf contains 12 QV8 cards (card slots 1–6 and 9–14), one VDS1 card (card slot 7), one FETH card (card slot 8), and one POWR card (card slot 15).



FETH interface cabling preparations

The user Ethernet interface to the *SuperLine* Access Shelf is located on the FETH card. This function is provided as a 10/100Base-T half/full duplex interface using Category 5 cable with an RJ-45 connector.

After the FETH card is initialized (i.e., when the Fail LED is no longer lighted), connect the 10/100Base-T network interface.

Use the following procedure to prepare the cabling of the *SuperLine* Access Shelf FETH card's 10/100Base-T interface to the data network. As necessary, consult the figure ***SuperLine* Access Shelf VDS1 and FETH cable routing** in this topic when routing cable to the FETH card.

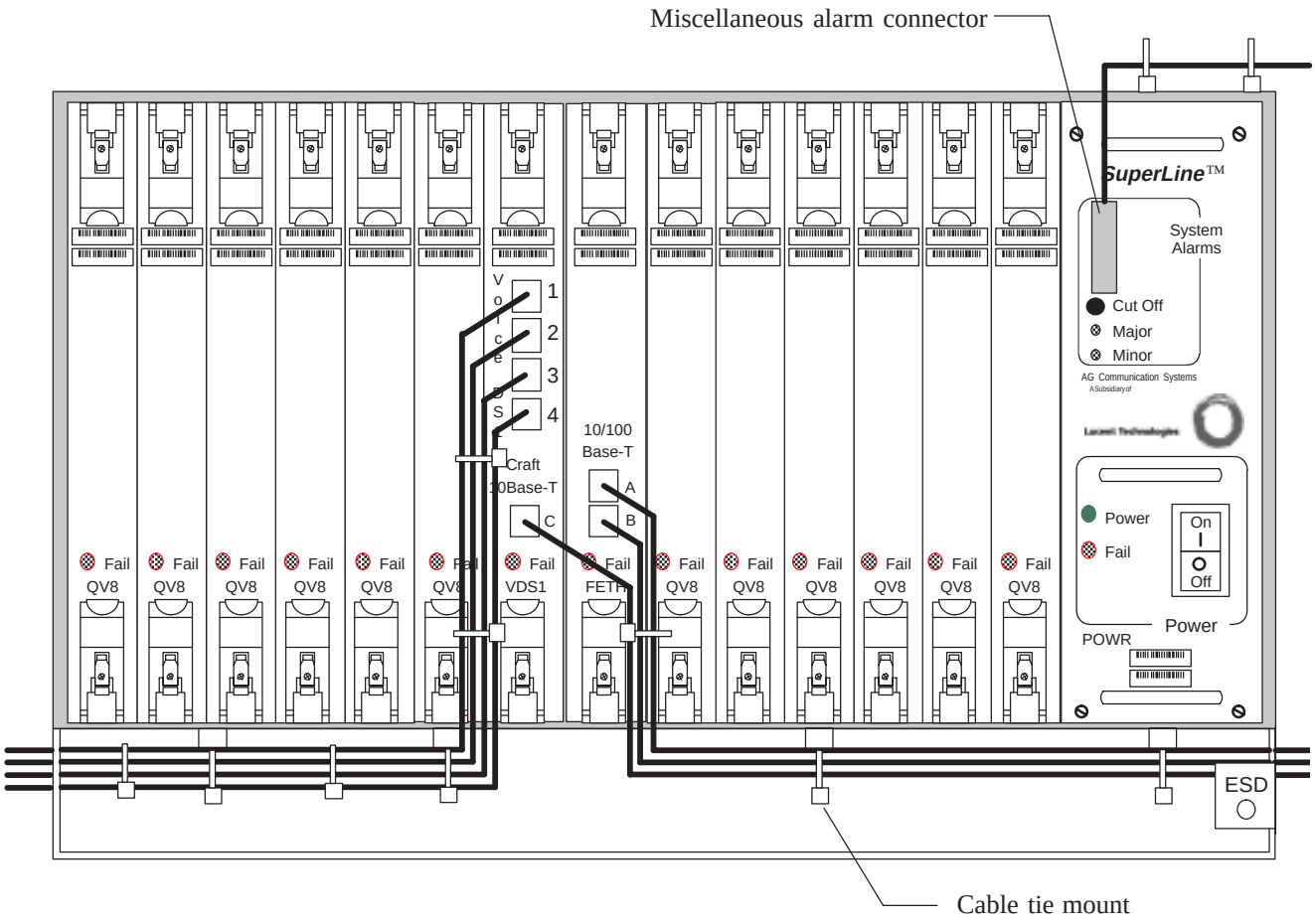
Important:

- For detailed Ethernet data connections, consult your data administrator.
- Use shielded cables if they are required by your local practices.
- If the cable runs through a *GTD-5* EAX switch area, run the cable in Zone 2. (Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones.) *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

Step	Action
1	Take one of the following actions: **IF ...** / **THEN ...** connecting directly from a PC/data server to the FETH card's Port A RJ-45 connection, / use a 10/100Base-T crossover cable; see the accompanying figure **Crossover cable pinouts** for pin assignments. connecting from a hub or network interface device to the FETH card's Port A RJ-45 connection, / use a 10/100Base-T straight-through cable.
2	Feed the 10/100Base-T data cable through the cable opening on the right side of the *SuperLine* Access Shelf baffle.
3	Connect the data cable to the FETH card's Port A RJ-45 connection. Result: The green Link Integrity LED is not lighted because no device is yet connected to the other end of the cable.
4	Tie the data cable to the two cable tie mounts provided.

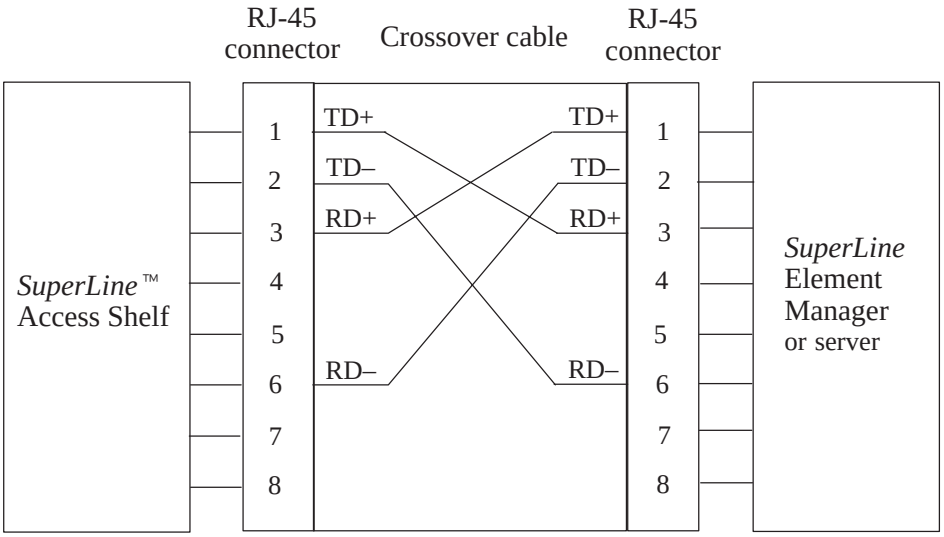
SuperLine Access Shelf VDS1 and FETH cable routing

The following figure shows requisite cabling to the VDS1, FETH, and POWR cards. Port B on the FETH card is used when daisy-chaining the *SuperLine* Access Shelf to Port A of the subtending shelf.



Crossover cable pinouts

The following figure shows the pinout assignment for a 10Base-T Ethernet crossover cable with RJ-45 connectors.



VDS1 craft interface cabling

The craft interface to the *SuperLine* Access Shelf is located on the VDS1 card. This function is provided as a 10Base-T interface using Category 5 cable with an RJ-45 connector.

After the VDS1 card is initialized (i.e., when the Fail LED is no longer lighted), connect the 10Base-T interface to the management network.

Use the following procedure to cable the *SuperLine* Access Shelf VDS1 card's Craft 10Base-T interface to the management network. As necessary, consult the figure ***SuperLine* Access Shelf VDS1 and FETH cable routing** in this topic when routing cable to the VDS1 card.

Important:

- For detailed Ethernet data connections, consult your data administrator.
- If the cable runs through a *GTD-5* EAX switch area, run the cable in Zone 2. (Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones.) *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

Step	Action
1	Take one of the following actions: **IF ...** / **THEN ...** connecting directly from the PC or workstation running *SuperLine* EM to the VDS1 card's Port C RJ-45 connection, / use a 10/100Base-T crossover cable; see the preceding figure **Crossover cable pinouts** for pin assignments. connecting from the management network using a hub or network interface device to the VDS1 card's Port C RJ-45 connection, / use a 10/100Base-T straight-through cable.
2	Feed the 10/100Base-T craft interface cable through the cable opening on the right side of the *SuperLine* Access Shelf baffle.
3	Connect the 10Base-T craft interface cable to the VDS1's Port C RJ-45 connector. Result: The green Link Integrity LED is not lighted because no device is yet connected to the other end of the cable.
4	Tie the 10Base-T craft interface cable to the cable tie mounts.

DS1 cabling

The VDS1 card provides the interface to the Voice DS1s.

Use the following procedure to cable the DS1s to the VDS1 card in the *SuperLine* Access Shelf. As necessary, refer to the figure ***SuperLine* Access Shelf VDS1 and FETH cable routing** in this topic for an illustration of DS1 cable routing to the VDS1 card.

Important:

- DS1 cabling is not required if the *SuperLine* Access Shelf will be configured for data only (refer to work order).
- Depending on traffic requirements, up to four DS1 cables can be connected to the front of the VDS1 card.
- System timing reference is extracted from either DS1 Port 1 or DS1 Port 2. Therefore, begin cabling with DS1 Port 1.
- If you are making your own DS1 cables, refer to the **RJ-48C pinouts** table in the Hardware description chapter for DS1 signalling pinout information.
- If the DS1 cables run through a *GTD-5* EAX switch area, run them in Zone 4. Refer to Practice 256-224-216, *Cabling Methods*, for detailed information on zones. *5ESS* and *DMS* users should consult their switch manufacturer's documentation for detailed cabling information.

Step	Action
1	Label the ends of each DS1 cable to be used. Example: "1" on each end of the DS1 cable going to Port 1 on the VDS1 card; "2" on each end of the cable going to Port 2; etc.
2	Feed the cables through the opening on the left side of the *SuperLine* Access Shelf baffle.
3	Tie the DS1 cables to the cable tie mounts.
4	Connect the DS1 RJ-48C jacks to the correct DS1 ports on the VDS1 card in accordance with the labeling plan developed in step 1.

□

Discovering the shelf's IP address and establishing the Element Manager connection

Introduction

Before executing this procedure, read the *SuperLine Access System Element Manager User's Guide* to understand the operation and configuration of the *SuperLine* Access Shelf using *SuperLine* Element Manager.

Procedure

Use the following procedure to install *SuperLine* Element Manager on the PC, laptop, or workstation that will be used to configure, manage, and monitor the status of the *SuperLine* Access System equipment.

Step	Action
1	Install EM software in accordance with instructions on the *SuperLine* Element Manager CD-ROM package provided by AG Communication Systems.
2	Establish the Element Manager connection to the *SuperLine* Access System by following instructions in the following sections of the *SuperLine Access System Element Manager User's Guide*: • Installation and Startup chapter: topics Configuring shelf-to-EM communication and Starting SuperLine EM • Managing *SuperLine* firmware chapter
3	a. Check that the Element Manager connection to the *SuperLine* Access System is established. b. Check that the green Link Integrity LED on Port C of the VDS1 card is lighted. c. If the Link Integrity LED is not lighted, refer to Appendix D, **Fault clearing**, for troubleshooting information.

□

Provisioning system information

Introduction

This procedure requires you to use the *SuperLine* Element Manager, as well as the *SuperLine Access System Element Manager User's Guide*.

Procedure

Use the following procedure to provision the *SuperLine* Access Shelf with system information. It is recommended that you save a hardcopy record of the system information. The record can be used to reconstruct system information should that be necessary; e.g., after replacing a faulty VDS1 or FETH card.

Step	Action
1	Define system information as described in the Displaying system information chapter of the *SuperLine Access System Element Manager User's Guide*. Information to include: • General information about the *SuperLine* Access System • Time and date. (Get time and date from your local digital switch administrator.) • Information about Simple Network Managment Protocol (SNMP) trap and community settings. (Get settings information from your network administrator.) • Miscellaneous system information, including the IP address of the shelf's TFTP (Trivial File Transfer Protocol) device. (Get miscellaneous system information from your network administrator.) • Shelf type. (Set to QV8.) • Data mode. (Get data mode setting from your network administrator.)

□

Provisioning telephony type and voice DS1s

Introduction

This procedure requires you to use the *SuperLine* Element Manager, as well as the *SuperLine Access System Element Manager User's Guide*.

Important: Appropriate line build out range (step 1) is determined by knowing the approximate distance in feet from the shelf to the terminating device; e.g., LDS, fiber multiplexer, or DS1 repeater.

Procedure

Use the following procedure to provision the *SuperLine* Access Shelf telephony configuration. It is recommended that you save a hardcopy record of the provisioning information. The record can be used to reconstruct provisioning information should that be necessary; e.g., after replacing a faulty VDS1 or FETH card.

Step	Action
1	In accordance with the work order, define the following parameters as described in the Monitoring and provisioning DS1s chapter of the *SuperLine Access System Element Manager User's Guide*: • Number of DS1s enabled (0–4) • DS1-1 (Line Build Out 1) • DS1-2 (Line Build Out 2) • DS1-3 (Line Build Out 3) • DS1-4 (Line Build Out 4) • Telephony type (DDI, TR-303, TR-008 Mode 1, or None) • Derived Lines/Loop
2	a. Reset the shelf using the Reset button in the Telephony tab screen to provision the telephony configurations. Resetting takes about 5 minutes. b. At the *SuperLine* Access Shelf, check shelf alarms as follows: • If telephony type is None, no shelf LEDs are lighted. • If telephony type is DDI, TR-303, or TR-008 Mode 1, the Major shelf alarm LED is lighted and the four red Local Alarm LEDs on the DS1 ports are lighted. c. If any *SuperLine* Access Shelf Fail LEDs remain lighted after resetting the shelf, refer to Appendix D, **Fault clearing**, for troubleshooting information.

□

Connecting shelf DS1s at the DSX panel

Introduction

Important: Skip this procedure is you have set telephony type to None in the procedure **Provisioning telephony type and voice DS1s**.

This procedure requires you to use the *SuperLine* Element Manager, as well as the *SuperLine Access System Element Manager User's Guide*.

Procedure

Use the following procedure to connect the *SuperLine* Access Shelf DS1s to the central office DSX panel and verify proper signaling.

Step	Action
1	a. Unplug all DS1 RJ-48C connectors at the VDS1 card. b. Connect or wire the *SuperLine* Access Shelf VDS1 card DS1 signal leads to the DSX panel in the order the cables were numbered. Refer to the ***SuperLine* Access Shelf DSX connections** table at the end of this topic for information.
2	a. Loop all shelf DS1s at the DSX panel toward the *SuperLine* Access Shelf. b. Plug the first DS1 RJ-48C connector into Port 1 of the VDS1 card. c. Check that the VDS1 Port 1 red Local Alarm LED is extinguished after 2 minutes. d. If the VDS1 Port 1 red Local Alarm LED is not extinguished, refer to Appendix D, **Fault clearing**, for troubleshooting information. e. Repeat 2b through 2d for all equipped DS1 cables.

Step	Action
3	a. Using the Status tab screen in the *SuperLine* Element Manager, check the visual indicators for the following icons: • For all telephony types – DS1 LEDs—off – Alarms—off – Circuit packs—off • For DDI and TR-008 Mode 1 – Major shelf LED—off • For TR-303 only – Major shelf LED—on (i.e., red) – EOCPRI and EOCSEC—on (i.e., red) – TMCPRI and TMCSEC—on (i.e., red) b. If circuit pack problems are indicated, click on the affected icon to go to the Inventory tab screen. Also, go to the Event Log tab screen for additional status. If the visual indicators that should be off are not extinguished, refer to Appendix D, **Fault clearing**, for troubleshooting information.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Optional: Use the Tekelec 8000 (DDI and TR-303 telephony types), T-COM 440B (TR-008 Mode 1 telephony type), or equivalent DS1 test equipment to verify the ABCD/AB signaling of each DS1 for the SuperLine Access Shelf. The test set configuration is as follows:
<table>
<tr><th></th><th>DDI and TR-303</th><th>TR-008 Mode 1</th></tr>
<tr><td>Menu</td><td>DS1</td><td>N/A</td></tr>
<tr><td>Configuration</td><td>Mon(itor)/Thru</td><td>Mon(itor)</td></tr>
<tr><td>Framing</td><td>ESF</td><td>Autodetected</td></tr>
<tr><td>Coding</td><td>B8ZS</td><td>Autodetected</td></tr>
<tr><td>Signaling</td><td>Yes</td><td>SIG > ENTR</td></tr>
</table>
a. Connect DS1 test equipment as follows:
• Tekelec 8000—Receive signal to the SuperLine Access Shelf Transmit/Monitor span lead.
• T-COM 440B—Input T1 to the SuperLine Shelf Transmit/Monitor span lead.
b. Verify the line ABCD/AB signaling by monitoring the DS1 signaling line.
c. Verify that the ABCD/AB signaling values are as follows:
<table>
<tr><th>Telephony Type</th><th>Value</th></tr>
<tr><td>DDI</td><td>• ABCD = 0101 for lines 1 through 24 (indicate idle channels)</td></tr>
<tr><td>TR-303 (spans 1–2)</td><td>• ABCD = 0101 for lines 1 through 11 (indicate idle channels)
• ABCD = 0000 or 1111 for line 12 (indicate primary [span 1]/secondary [span 2] data link EOC)
• ABCD = 0101 for lines 13 through 23 (indicate idle channels)
• ABCD = 0000 or 1111 for line 24 (indicate primary [span 1]/secondary [span 2] data link TMC)</td></tr>
</table>
</td></tr>
</table>

Step	Action	
4 cont'd	TR-303 (spans 3–4)	• ABCD = 0101 for lines 1 through 24 (indicate idle channels)
	TR-008 Mode 1	• AB = 01 for lines 1 through 24 (indicate idle channels if the channels are equipped)

SuperLine Access Shelf DSX connections

Use the following table to connect the *SuperLine* Access Shelf VDS1 card DS1 signal leads at the DSX panel.

VDS1 RJ-48C Jack Pin Number	Wire Color	VDS1 DS1 Signal	*SuperLine* ™ DSX Panel DS1 Wiring
1	White-Orange	Receive Ring	Ring–IN
2	Orange	Receive Tip	Tip–IN
4	White-Blue	Transmit Ring	Ring–OUT
5	Blue	Transmit Tip	Tip–OUT

□

Cross-connecting DS1s at the DSX panel

Introduction

Important: Skip this procedure is you have set telephony type to None in the procedure **Provisioning telephony type and voice DS1s**.

Prior to cross-connecting the *SuperLine* Access Shelf DS1s at the DSX panel, verify the following:

- The shelf is provisioned, configured, and operational, with *SuperLine* spans looped toward the *SuperLine* Access Shelf at the DSX panel.
- Line build out of the switch and shelf are set.
- The Recent Change database at the local digital switch has been engineered properly and the LDS spans/IFACs are looped at the DSX panel.
- The Hardware Identifiers (HIDs) or Line Equipment Numbers (LENs) of the baseband voice lines are known, as well as the MDF cross-connections and the DS1 cross-connects.
- The SPFM is cabled to the CO Equipment and External Facilities terminal blocks.

Procedure

Use the following procedure to cross-connect DS1s at the DSX panel. The figure **Cross-connecting DS1s at the DSX panel** at the end of this topic illustrates the proper connection of the transmit signal of each *SuperLine* Access Shelf DS1 to the receive signal of the corresponding local digital switch DS1 and vice versa; that is, the transmit signal of the local digital switch DS1 to the corresponding receive signal of each *SuperLine* Access Shelf DS1.

Step	Action
1	Remove the LDS spans/IFACs loopbacks and the *SuperLine* Access Shelf DS1 loopbacks at the DSX panel.
2	Cross-connect the DS1s as follows: • Connect the transmit signal of each *SuperLine* Access Shelf DS1 to the receive signal of the corresponding LDS DS1. • Connect the transmit signal of the LDS DS1 to the corresponding receive signal of each *SuperLine* Access Shelf DS1. Important: Refer to the table **DS1 cross-connects** at the end of this topic for a depiction of the DSX physical connections for the DS1 cross-connects.

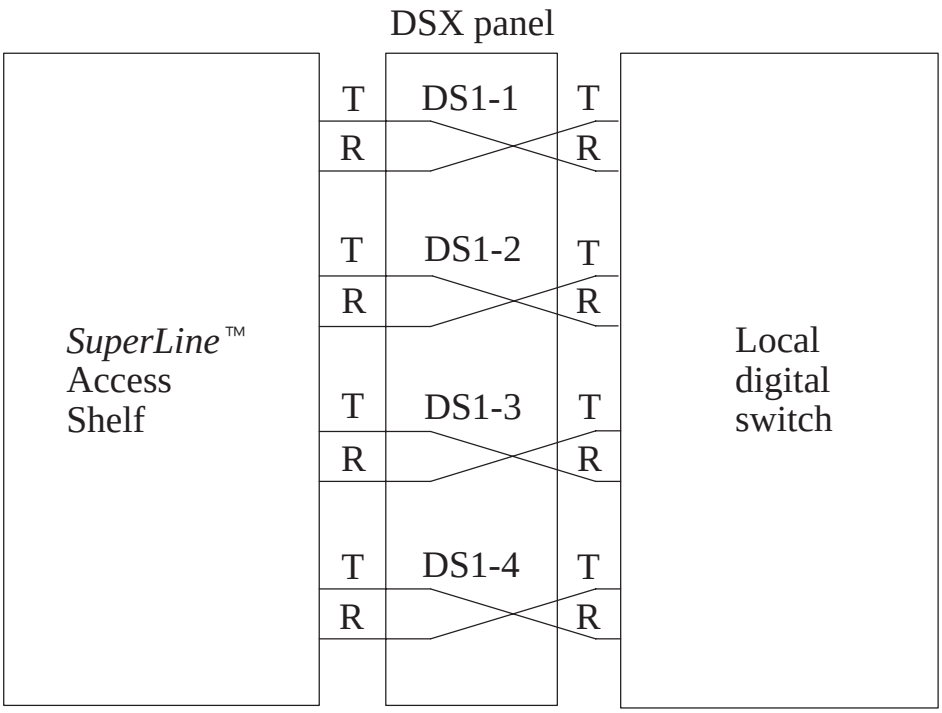
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>
a. Verify that the status of all spans/IFACs/DS1 links is in service.
b. If necessary, force the spans/IFACs/DS1 links in service using the following commands depending on switch and telephony type:
<u>*GTD-5* EAX Users</u>:
<table>
<tr><th>Telephony Type</th><th>Command</th></tr>
<tr><td>DDI/TR-303</td><td>FORCE INS DCXR.TCU<TCU#>.<FIU#>.<PIU#></td></tr>
<tr><td>TR-303 only</td><td>If the data links (EOC/TMC) are not in service, use the following commands to force them in service:
FORCE INS TMC.TCU<TCU#>.<FIU#>.<PIU#>.23
FORCE INS EOC.TCU<TCU#>.<FIU#>.<PIU#>.11</td></tr>
</table>
<u>Results</u>:
a. The spans are active. If the status of the spans is out of service, a problem exists at the DSX panel and/or the *SuperLine* Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
b. EOC/TMC data links are in service. If the status of the EOC/TMC data links is out of service, a problem exists at the DSX panel and/or the *SuperLine* Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3
cont'd</td><td>
<u>5ESS Users</u>:
<table>
<tr><th>Telephony Type</th><th>Command</th></tr>
<tr><td>TR-303/
TR-008
Mode 1</td><td>RST:IFAC=<SM#>-<IDCU#>-<IFAC#>
<u>Important</u>: If you have used poke 1880,<IDCU#>,<TR#>, then type:
3<IFAC#></td></tr>
<tr><td>TR-303 only</td><td>If the data links (EOC/TMC) are not in service, use the following poke to get to the RT screen:
1880,<IDCU#>,<RT#>
Then use the following pokes to restore the data links:
• EOC—340 or 341
• TMC—350 or 351</td></tr>
</table>
<u>Results</u>:
a. The IFACs are active. If the status of the IFACs is out of service, a problem exists at the DSX panel and/or the SuperLine Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
b. EOC/TMC data links are in service. If the status of the EOC/TMC data links is out of service, a problem exists at the DSX panel and/or the SuperLine Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3
cont’d</td><td>
<u>DMS Users</u>:
<table>
<tr><th>Telephony Type</th><th>Command</th></tr>
<tr><td>TR-303</td><td>Using the MAP terminal,
a. post the IDT number by using the following poke:
MAPCI;MTC;PM;POST IDT #
b. check the status of DS1 links by using the following poke:
TRANSL
c. put the DS1 link in service (OK) by using the following poke:
RTS LINK #
d. check that the status of active/standby EOC/TMC data links is in service (InSv) by using the following poke:
PPS QUERY
e. If the EOC/TMC data links are inhibited, use the following pokes to put them into service:
PPS ENA TMC1
PPS ENA TMC2
PPS ENA EOC1
PPS ENA EOC2</td></tr>
<tr><td>TR-008
Mode 1</td><td>Using the MAP terminal,
a. post the SMS number by using the following poke:
MAPCI;MTC;PM;POST SMS #
b. check the status of DS1 links by using the following poke:
QUERYPM FLT
c. put the DS1 link in service (OK) by using the following poke:
RTS LINK #</td></tr>
</table>
<u>Results</u>:
a. The DS1 links are active. If the status of the DS1 links is out of service, a problem exists at the DSX panel and/or the SuperLine Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
b. EOC/TMC data links are in service. If the status of the EOC/TMC data links is out of service, a problem exists at the DSX panel and/or the SuperLine Access Shelf. Consult Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
</table>

Cross-connecting DS1s at the DSX panel

The following figure shows DS1 connections between the *SuperLine* Access Shelf and the local digital switch.



LEGEND:
DSX Digital signal cross-connection
R DS1 receive signal
T DS1 transmit signal

DS1 cross-connects

The following table depicts the DSX physical connections for each DS1 cross-connect.

CO DSX Panel DS1 Wiring	*SuperLine*™ DSX Panel DS1 Wiring
Tip–OUT	Tip–IN
Ring–OUT	Ring–IN
Tip–IN	Tip–OUT
Ring–IN	Ring–OUT

□

Installing QV8 cards

Introduction

Each QV8 card supports up to eight derived lines. Of all the shelf cards, only QV8 cards are hot swappable; that is, they can be inserted into or removed from the *SuperLine* Access Shelf while the shelf is energized without causing damage to any shelf cards or shelf services. It is recommended that QV8 cards be inserted sequentially in the shelf, starting with card slot 1.

This procedure requires you to use the *SuperLine* Element Manager, as well as the *SuperLine Access System Element Manager User's Guide*.

Important: Insert blank faceplates to unequipped QV8 card slots.

Procedure

Use the following procedure to install QV8 cards in the *SuperLine* Access Shelf.

CAUTION

Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

CAUTION

Bodily injury hazard

Avoid pulling or pushing bare hands on sharp metal edges when handling circuit cards. Failure to take adequate care when installing or removing circuit cards can result in bodily injury.

Step	Action
1	Read and observe the preceding cautionary messages concerning ESD damage and bodily injury hazards.
2	Attach an antistatic wrist strap and ground yourself to the ESD socket.

Step	Action
3	a. Insert and secure each QV8 card into the *SuperLine* Access Shelf. (See the figure **Fully equipped *SuperLine* Access Shelf** in the topic Installing and cabling VDS1 and FETH cards in this chapter for an illustration of shelf card placement.) b. If the *SuperLine* Access Shelf is de-energized, move the rocker Power switch on the POWR card upward to the On position. Result: The *SuperLine* Access Shelf module is powered on and the cards start to initialize (red Fail LEDs lighted). The initialization process may take up to 5 minutes.
4	a. Verify that all *SuperLine* Access Shelf cards are initialized by checking to see that the cards' Fail LEDs are extinguished. b. If any Fail LEDs are not extinguished after 5 minutes, refer to Appendix D, **Fault clearing**, for troubleshooting information.
5	Check the status of the QV8 cards by using the Status tab screen in the *SuperLine* Element Manager. (Refer to the Monitoring status chapter in the *SuperLine Access System Element Manager User's Guide* for information on viewing QV8 card status.)

□

Verifying derived line operations at the CO before deployment

Procedure

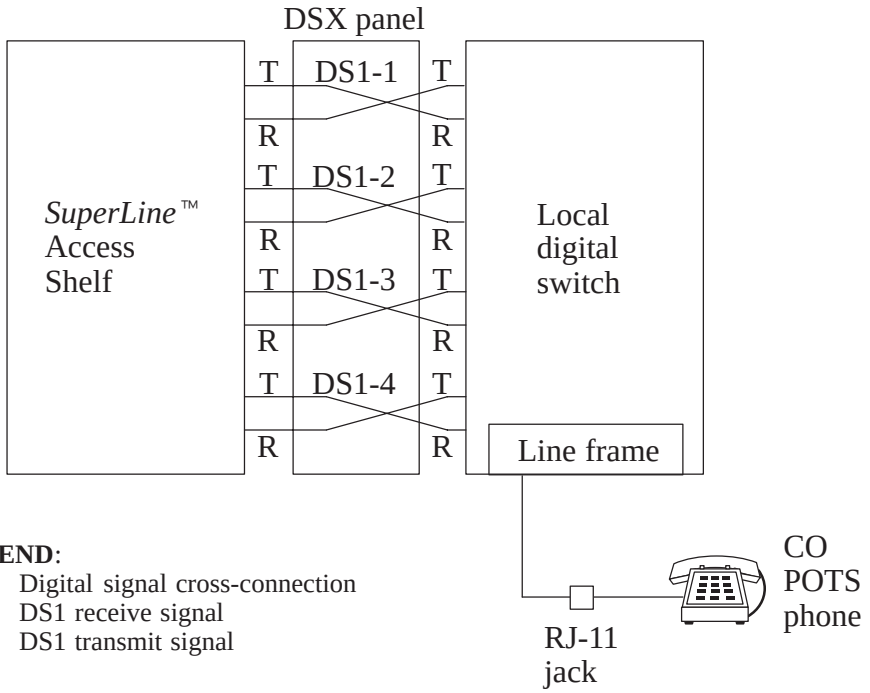
Use the following procedure to verify the baseband capabilities of the *SuperLine* Access Shelf using an unassigned CO POTS line. (The CO POTS line is DTMF loopstart.) If there is no CO POTS line, engineer the database and the DN for the POTS line.

The accompanying figure **CO POTS line connection** shows the CO POTS line connected to the local digital switch.

Step	Action
1	a. Check that the dial tone is present on the CO POTS line. b. If the dial tone is not present on the CO POTS line, refer to Appendix D, **Fault clearing**, for troubleshooting information.

CO POTS line connection

The CO POTS line is connected to the local digital switch for purposes of verifying the baseband line features.



LEGEND:
DSX Digital signal cross-connection
R DS1 receive signal
T DS1 transmit signal

□

Connecting CO POTS line and CO *SuperLine* IAD to new terminal blocks

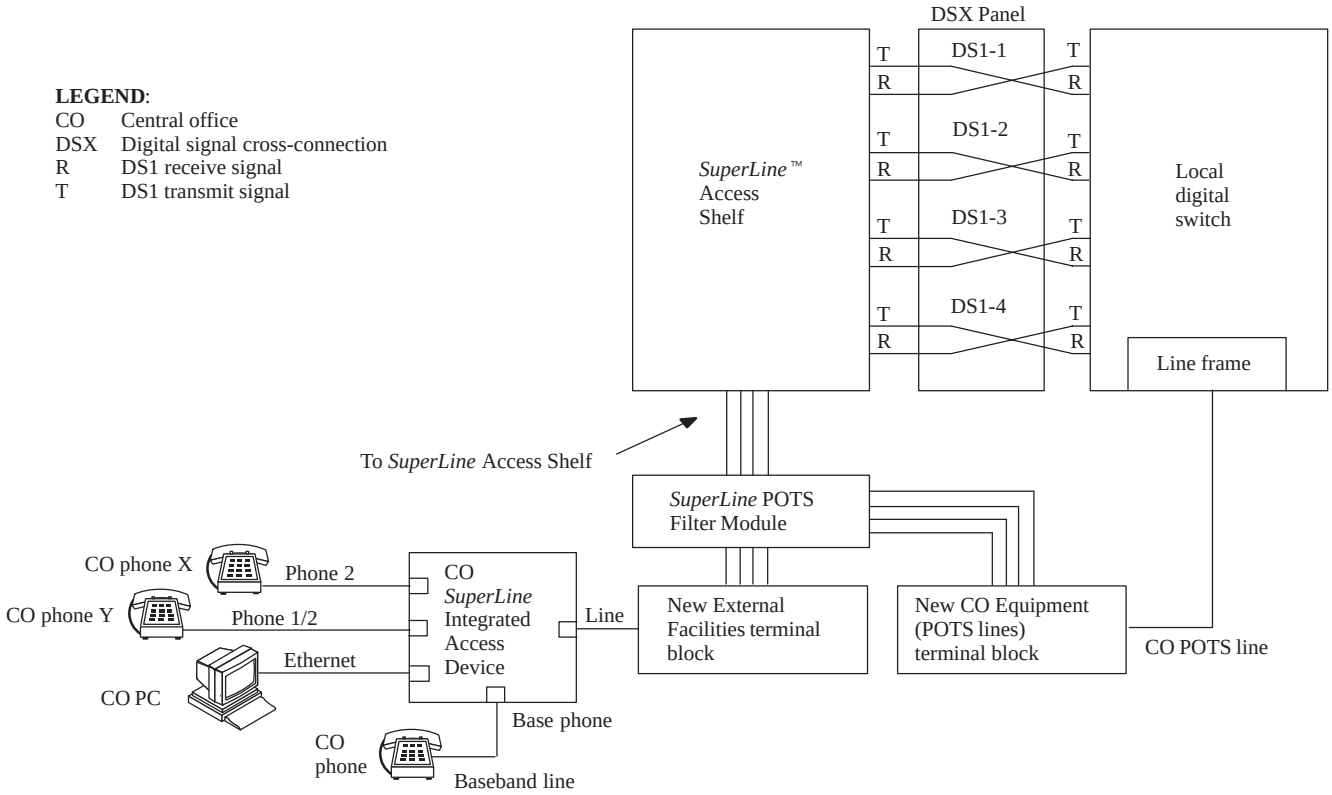
Procedure

Use the following procedure to connect the CO POTS line to the new CO Equipment terminal block and the CO *SuperLine* Integrated Access Device to the new External Facilities terminal block. The figure ***SuperLine* Access Shelf prior to cutover** at the end of this topic illustrates their proper connections.

Step	Action
1	Connect the CO POTS line to the appropriate tip/ring cross-connects of the new CO Equipment terminal block.
2	Connect the CO *SuperLine* Integrated Access Device line input (labeled “Line” in the figure) to the appropriate tip/ring cross-connects of the new External Facilities terminal block.
3	a. Connect the CO phone to the *SuperLine* Integrated Access Device’s base phone jack. b. With the *SuperLine* Integrated Access Device powered off, using CO phone verify that dial tone is present on the baseband line.
4	a. Power up the *SuperLine* Integrated Access Device. b. Verify that dial tone is present on the CO phone. c. If no dial tone is present on the baseband line, refer to Appendix D, **Fault clearing**, for troubleshooting information.

SuperLine Access Shelf prior to cutover

The following figure illustrates the equipment and equipment connections involved in testing derived and baseband voice lines at the central office.



Testing CO baseband voice and derived lines at the local digital switch

Procedure

Use the following procedure to test the CO baseband voice and derived lines at the local digital switch. The figure ***SuperLine* Access Shelf prior to cutover** in the topic Connecting CO POTS line and CO *SuperLine* Integrated Access Device CO to new terminal blocks in this chapter illustrates the equipment involved in end-to-end derived lines and baseband testing of all equipped QV8 cards prior to cutover.

Important:

- In this procedure, server and client test equipment may be a Fluke meter or equivalent test equipment or a PC/workstation.
- Skip step 2 if your switch is *5ESS* or *DMS*. Skip steps 3–5 if you set telephony type to None.

Step	Action
1	a. Consult your network administrator for the appropriate client/server test equipment. b. Check the Ethernet connection as follows: 1. Following instructions in the Managing subscriber lines chapter of the *SuperLine Access System Element Manager User's Guide*, set the following parameters for data traffic on derived lines: • Set Data State: Enabled • Data Ratio Up/Down: 20/80 2. Using an Ethernet crossover cable, connect client to the Ethernet port on the *SuperLine* Integrated Access Device under test. 3. Using an Ethernet crossover cable, connect server to Port A on the FETH card. 4. Ensure that the Link Integrity LED on the FETH card is lighted. 5. If the Link Integrity LED on the FETH card is not lighted, refer to Appendix D, **Fault clearing**, for troubleshooting information. 6. Ping the TCP/IP address of server continuously from client. 7. Verify that the ping is successful. 8. If the ping is not successful, refer to Appendix D, **Fault clearing**, for troubleshooting information. 9. Stop the ping and disconnect the test equipment from the *SuperLine* Integrated Access Device and the FETH card.

Step	Action
2	Important: For *GTD-5* EAX users only. Callers making a *SuperLine* derived-line to derived-line call may experience a delay effect, which takes the form of an echo of the caller's voice. The effect can be corrected by inserting a –12 dB loss digital pad value (DPV) using the following IOM engineering command: **`SET DPV.STAN.TWOx.x PADA=DB6 PADB=DB6`** where `x.x` is unused DPV index Important: 1. Determine unused DPV index by using the `EXAM DPV.ALL` at the IOM terminal. Use this index later in the `ADD DN` command. 2. For more information, refer to the `SET DPV` command in Part 13 of the *GTD-5 EAX User's Guide*. To help ensure V.90 modem call data integrity, a 0 dB loss DPV index must be inserted for a call between derived line and a Primary Rate Interface (PRI) trunk. (The PRI trunk is assigned for connecting the V.90 dial-up modem pool server to the *GTD-5* EAX switch.) The following IOM command is used in the engineering session to assign the unused DPV index for the V.90 modem call: **`SET DPV.STAN.TWOy.y PADA=DB0 PADB=DB0`** where `y.y` is unused DPV index

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Important: Skip this step if you have set telephony type to None.
a. In accordance with the work order, assign a new telephone number to each derived line.
b. Engineer the RC database of each derived line as follows:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>at the IOM terminal, type (example):
• DDI—ADD DN 309-854-1126 DLIN.TCU0.0.0.0 SPTT S101 FAR0 NROU LTT0 RING.MFR.1.R DPV06
• TR-303—ADD DN 309-854-1126 RALT.RLU63.1 SPTT S101 FAR0 NROU LTT7 RING.MFR.1.R DPV06
Important:
1. Use the ADD DN command to add applicable DDI/TR-303 loopstart features. Refer to the ADD DN command in Recent Change Service Order Commands, Part 12 of the GTD-5 EAX User's Guide.
2. The SuperLine Access Shelf only supports DDI/TR-303 loopstart features. Use the SPTT or SPTC fields in the ADD DN command.
3. The SuperLine Access Shelf does not support the GTD-5 EAX single-party dial pulse receiving feature. The SPTD field must not be used in the in the ADD DN command.
4. The SuperLine Access Shelf does not support multiparty and superimposed ringing. Use RING.MFR.1.R in the ADD DN command.
5. SuperLine derived lines do not support line routining; therefore, the NROU field must be used in the ADD DN command for DDI application.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3
cont'd</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX, cont'd</td><td>6. The GTD-5 EAX supports the default <code>LTT0</code> field only in the <code>ADD DN</code> command for the DDI application.
7. Certain GTD-5 EAX ACCESS tests are supported on derived lines in the DDI application. For a listing of these tests, see the SuperLine Access System Applications and Engineering manual.
8. SuperLine derived lines in the TR-303 application do not support line testing; therefore, the <code>LTT7</code> field must be assigned in the <code>ADD DN</code> command.</td></tr>
<tr><td>5ESS</td><td>using Recent Change View 1.6, insert the new telephone numbers.</td></tr>
<tr><td>DMS</td><td>at the MAP terminal, under SERVORD level, use the following pokes to add SuperLine DNs (<code>XXXXXXX</code> in poke):
TABLE LNINV
ADD SLN1 0 0 0 1 RDTLSG
STDLN HASU
NEW $ XXXXXXX</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Important: Skip this step if you have set telephony type to None.
a. Verify that the status of the derived lines is INS:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX
• DDI</td><td>at the IOM terminal, type (example):
DUMP STAT DLIN.TCUO.0.0.0
DUMP STAT DLIN.TCUO.0.0.1</td></tr>
<tr><td>• TR-303</td><td>DUMP STAT RALT.RLU.63.1
DUMP STAT RALT.RLU.63.2</td></tr>
<tr><td>5ESS</td><td>at the Remote Trunk Line workstation, type (example):
OP:STATUS,ILEN=1-0-20-1
OP:STATUS,ILEN=1-0-20-2</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4
cont’d</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>DMS</td><td>at the MAP terminal, use the following pokes and check that the status of both lines is IDLE:
MAPCI;MTC;LNS;LTP
POST D XXXXXXX
where XXXXXXX is a temporary DN
POST D YYYYYYY
where YYYYYYY is a temporary DN</td></tr>
</table>
b. If the status of the derived lines is OOS, refer to Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
<tr><td>5</td><td>Important: Skip this step if you have set telephony type to None.
a. Connect two DTMF phones to the CO SuperLine Integrated Access Device phone 1/2 and phone 2 jacks.
b. Verify that dial tone is present on both derived phone lines.
c. If the dial tone is not present on both phones, refer to Appendix D, Fault Clearing, for troubleshooting information.
d. Make line-to-line calls using both phones.
e. Verify that dial tone is present on baseband voice line when the call is up on the two derived lines.</td></tr>
<tr><td>6</td><td>Take one of the following actions depending on telephony type:
<table>
<tr><th>Telephony Type</th><th>Action</th></tr>
<tr><td>DDI, TR-303,
TR-008 Mode 1</td><td>a. Ring the baseband voice line from the other CO phone while making calls on the derived lines.
b. Verify that all derived line calls complete successfully.
c. If the derived line calls did not complete successfully, refer to Appendix D, Fault clearing, for troubleshooting information.</td></tr>
<tr><td>None</td><td>a. Ring the baseband voice line from the other CO phone.
b. If the baseband call did not complete successfully, refer to Appendix D, Fault clearing, for troubleshooting information.</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Disconnect the CO SuperLine Integrated Access Device from the new External Facilities terminal block.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>8</td><td>
a. Create alarms at the SuperLine Access Shelf by removing Port 1 DS1 cable on the VDS1 card.
b. Check that the Major shelf LED and DS1-1L LED are reported (lighted) at the Element Manager for all telephony types; additionally, for TR-303 only check that the EOCPRI and TMCPRI icons are lighted.
c. If telephony type is not None, check that the alarms are reported at the LDS by using one of the following switch commands. (If telephony type is None, alarms are reported and cleared at the Element Manager only.)
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX
• TR-303</td><td>at the IOM terminal, type (example):
DUMP STAT RT.RLU<#> ALARM
Result: EOC, TMC primary datalinks, and DS1-1 are OOS.</td></tr>
<tr><td>• DDI</td><td>at the IOM terminal, type (example):
DUMP STAT SPAN.TCU<#>.<FIU#>.<PIU#>
Result: DS1-1 is OOS.
Important: For DDI applications, power and miscellaneous alarms are not reported at the LDS.</td></tr>
<tr><td>5ESS
• TR-303</td><td>at the Remote Trunk Line workstation, type the following poke:
OP:RT,SID=#
Result: EOC, TMC primary datalinks, and DS1-1 are OOS.</td></tr>
<tr><td>• TR-008 Mode 1</td><td>at the Remote Trunk Line workstation, type the following poke:
OP:RT,SID=#
Result: DS1-1 and DIGROUP A are OOS.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>8
cont’d</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>DMS
• TR-303</td><td>at the MAP terminal, use the following pokes to post the IDT and get the LDS alarms:
MAPCI;MTC;PM;POST IDT #
RDTALARM
Result: EOC, TMC primary datalinks, and DS1-1 are OOS.</td></tr>
<tr><td>• TR-008 Mode 1</td><td>at the MAP terminal, use the following pokes to post the SMS and get the LDS alarms:
MAPCI;MTC;PM;POST SMS 0
QUERYPM FLT
Result: DS1-1 and DIGROUP A are OOS.</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>a. Remove the alarm condition at the SuperLine Access Shelf by reconnecting the Port 1 DS1 cable on the VDS1 card.
b. Check that no alarm is reported at the Element Manager and at the LDS.
c. If alarms are reported, refer to Appendix D, Fault clearing, for troubleshooting information.</td></tr>
</table>

□

Cutting over subscriber baseband voice and derived lines at the local digital switch

Introduction

Before cutting over a subscriber for *SuperLine* services (derived line 1, derived line 2, Ethernet data, baseband line), it is good practice to check the external loop characteristics (gauge, loop loss) from the work order and verify this loop loss meets the *SuperLine* loop requirements described in the *SuperLine Access System Applications and Engineering* guide.

Procedure

Use the following procedure to cut over the baseband voice and derived lines at the local digital switch. See the figure ***SuperLine* Access Shelf cutover** at the end of this topic for an illustration showing lines that are cut over to the *SuperLine* Access Shelf. To see how derived lines in the DDI and TR-008 Mode 1 configurations are mapped for the *SuperLine* Access Shelf, see Appendix C, **DS0 channel assignments for EM telephony configurations**.

Important: Skip step 7 if your switch is *5ESS* or *DMS*. Skip steps 8, 9, and 10 if you set telephony type to None.

Step	Action
1	Connect the POTS lines between the new CO Equipment terminal block and the existing CO Equipment terminal block via new cross-connects.
2	Connect the External Facilities between the new External Facilities terminal block and the existing External Facilities terminal block via new cross-connects.
3	Remove the existing cross-connects between the existing CO Equipment terminal block and the existing External Facilities terminal block.
4	Connect the CO *SuperLine* Integrated Access Device line input to the new External Facilities terminal block.
5	a. Connect the CO telephone to the *SuperLine* Integrated Access Device's existing base phone jack. b. With the *SuperLine* Integrated Access Device powered off, using CO phone verify that dial tone is present on the baseband line. c. If no dial tone is present on the baseband line, refer to Appendix D, **Fault clearing**, for troubleshooting information.
6	a. Power up the *SuperLine* Integrated Access Device. b. Verify that dial tone is present on the CO telephone. c. If no dial tone is present on the CO telephone, refer to Appendix D, **Fault clearing**, for troubleshooting information.

Step	Action
7	Important: For *GTD-5* EAX users only. Callers making a *SuperLine* derived-line to derived-line call may experience a delay effect, which takes the form of an echo of the caller's voice. The effect can be corrected by inserting a –12 dB loss DPV using the following IOM engineering command: **`SET DPV.STAN.TWOx.x PADA=DB6 PADB=DB6`** where `x.x` is unused DPV index Important: 1. Determine unused DPV index by using the `EXAM DPV.ALL` at the IOM terminal. Use this index later in the `ADD DN` command. 2. For more information, refer to the `SET DPV` command in Part 13 of the *GTD-5 EAX User's Guide*. To help ensure V.90 modem call data integrity, a 0 dB loss DPV index must be inserted for a call between derived line and a PRI trunk. (The PRI trunk is assigned for connecting the V.90 dial-up modem pool server to the *GTD-5* EAX switch.) The following IOM command is used in the engineering session to assign the unused DPV index for the V.90 modem call: **`SET DPV.STAN.TWOy.y PADA=DB0 PADB=DB0`** where `y.y` is unused DPV index

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>8</td><td>Important: Skip this step if you have set telephony type to None.
a. In accordance with the work order, assign a new telephone number to each derived line.
b. Engineer the RC database of each derived line as follows:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>at the IOM terminal, type (example):
• DDI—ADD DN 309-854-1126 DLIN.TCU0.0.0.0 SPTT S101 FAR0 NROU LTT0 RING.MFR.1.R DPV06
• TR-303—ADD DN 309-854-1126 RALT.RLU63.1 SPTT S101 FAR0 NROU LTT7 RING.MFR.1.R DPV06
Important:
1. Use the ADD DN command to add applicable DDI/TR-303 loopstart features. Refer to the ADD DN command in Recent Change Service Order Commands, Part 12 of the GTD-5 EAX User's Guide.
2. The SuperLine Access Shelf only supports DDI/TR-303 loopstart features. Use the SPTT or SPTC fields in the ADD DN command.
3. The SuperLine Access Shelf does not support the GTD-5 EAX single-party dial pulse receiving feature. The SPTD field must not be used in the in the ADD DN command.
4. The SuperLine Access Shelf does not support multiparty and superimposed ringing. Use RING.MFR.1.R in the ADD DN command.
5. SuperLine derived lines do not support line routining; therefore, the NROU field must be used in the ADD DN command for DDI application.</td></tr>
</table></td></tr>
</table>

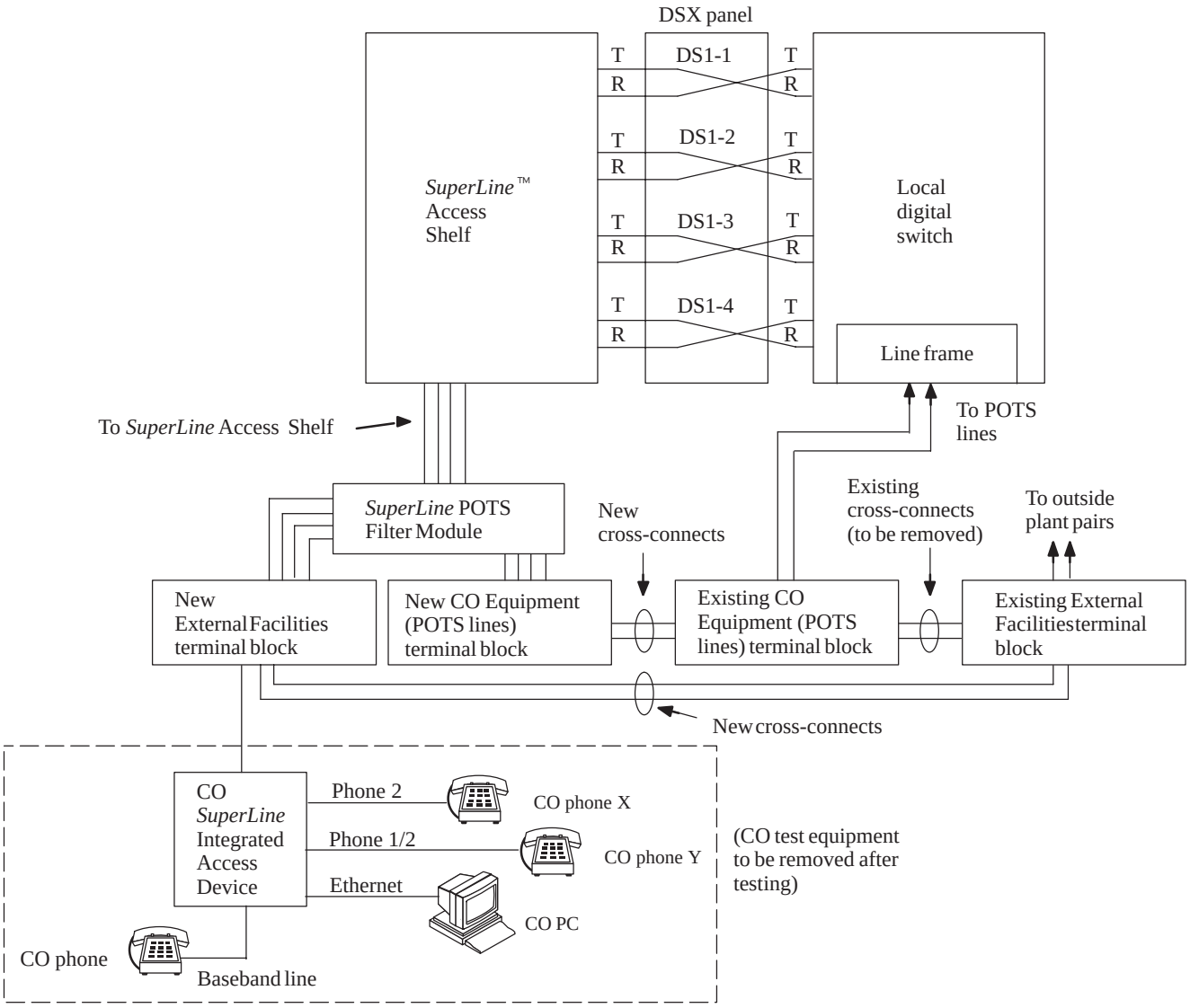
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>8
cont’d</td><td>
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX, cont’d</td><td>6. The GTD-5 EAX supports the default <code>LTT0</code> field only in the <code>ADD DN</code> command for the DDI application.
7. Certain GTD-5 EAX ACCESS tests are supported on derived lines in the DDI application. For a listing of these tests, see the SuperLine Access System Applications and Engineering manual.
8. SuperLine derived lines in the TR-303 application do not support line testing; therefore, the <code>LTT7</code> field must be assigned in the <code>ADD DN</code> command.</td></tr>
<tr><td>5ESS</td><td>using Recent Change View 1.6, insert the new telephone numbers.</td></tr>
<tr><td>DMS</td><td>at the MAP terminal, under SERVORD level, use the following pokes to add SuperLine DNs (<code>XXXXXXX</code> in poke):
<code>TABLE LNINV
ADD SLN1 0 0 0 1 RDTLSG
STDLN HASU
NEW $ XXXXXXX</code></td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Important: Skip this step if you have set telephony type to None.
a. Verify that the status of the derived lines is INS as follows:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX
• DDI</td><td>at the IOM terminal, type (example):
<code>DUMP STAT
DLIN.TCUO.0.0.0
DUMP STAT
DLIN.TCUO.0.0.1</code></td></tr>
<tr><td>• TR-303</td><td><code>DUMP STAT RALT.RLU.63.1
DUMP STAT RALT.RLU.63.2</code></td></tr>
<tr><td>5ESS</td><td>at the Remote Trunk Line workstation, type (example),
<code>OP:STATUS,ILEN=1-0-20-1
OP:STATUS,ILEN=1-0-20-2</code></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>9
cont’d</td><td>
<table>
<tr><td>DMS</td><td>at the MAP terminal, use the following pokes:
MAPCI;MTC;LNS;LTP
POST D XXXXXXX
where XXXXXXX is derived line 1 DN
POST D YYYYYYY
where YYYYYYY is derived line 2 DN</td></tr>
</table>
b. If the status of the lines is not INS, refer to Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
<tr><td>10</td><td>Important: Skip this step if you have set telephony type to None.
a. Verify dial tone is present on both derived lines.
b. Make line-to-line call.
c. If dial tone is not present on both derived lines, refer to Appendix D, Fault clearing, for troubleshooting information.</td></tr>
<tr><td>11</td><td>a. Verify that the diagnostic tests on the baseband line successfully completes after SuperLine cutover as follows:
<table>
<tr><th>IF SWITCH IS ...</th><th>THEN ...</th></tr>
<tr><td>GTD-5 EAX</td><td>1. at the IOM terminal, type (example):
ROUT DN XXX-XXXX RUN5
where XXX-XXXX is the baseband DN
2. verify that the tests results are ATP.</td></tr>
<tr><td>5ESS</td><td>1. at the Remote Trunk Line workstation, type (example):
EXC:LIT,OPT=G,DN=XXXXXXX
where XXXXXXX is the baseband DN
2. verify that the following test results are returned:
FEMF SRG TRG
Q Q Q</td></tr>
<tr><td>DMS</td><td>1. at the MAP terminal, use the following poke:
REPEAT 5 (DIAG)
2. verify that the tests results are ATP.</td></tr>
</table>
b. If the diagnostic tests on the baseband fail, refer to Appendix D, Fault clearing, for troubleshooting information.
</td></tr>
</table>

Step	Action
12	a. Consult your network administrator for the appropriate client/server test equipment. b. Check the Ethernet connection as follows: 1. Following instructions in the Managing subscriber lines chapter of the *SuperLine Access System Element Manager User's Guide*, set the following parameters for data traffic on derived lines: • Set Data State: Enabled • Data Ratio Up/Down: 20/80 2. Using an Ethernet crossover cable, connect client to the Ethernet port on the *SuperLine* Integrated Access Device under test. 3. Using an Ethernet crossover cable, connect server to Port A on the FETH card. 4. Ensure that the Link Integrity LED on the FETH card is lighted. 5. If the Link Integrity LED on the FETH card is not lighted, refer to Appendix D, **Fault clearing**, for troubleshooting information. 6. Ping the TCP/IP address of server continuously from client. 7. Verify that the ping is successful. 8. If the ping is not successful, refer to Appendix D, **Fault clearing**, for troubleshooting information. 9. Stop the ping and disconnect the test equipment from the *SuperLine* Integrated Access Device and the FETH card.
13	Repeat steps 1–12 for all equipped baseband voice lines and derived lines.
14	a. Disconnect all phones from the CO *SuperLine* Integrated Access Device. b. Disconnect the CO *SuperLine* Integrated Access Device from the External Facilities terminal block.

SuperLine Access Shelf cutover

The following figure shows subscriber baseband voice and derived lines that are cut over to the *SuperLine* Access Shelf.



□

5 Adding and replacing shelf equipment

Overview

Introduction

This chapter provides instructions for adding and replacing AG Communication Systems *SuperLine*™ Access System equipment, including shelf cards and the *SuperLine* POTS filter cards (SPFCs) that are inside the *SuperLine* POTS Filter Module (SPFM). It also describes how to properly insert and remove cards to reduce the risk of damage to the shelf, the SPFM, or the cards themselves.

In this chapter

This chapter covers the following topics:

□

Introduction

Shelf cards

The *SuperLine* Access Shelf contains the following:

- One to 12 QV8 cards
- One FETH card
- One VDS1 card
- One POWR card

QV8 cards are hot swappable and can be added or replaced in the *SuperLine* Access Shelf (see **Card positions**) without turning power off at the shelf or interrupting shelf services.

CAUTION

Equipment damage hazard

Remove power to the shelf by pressing the rocker switch on the POWR card to the Off position before adding or replacing the FETH, VDS1, or POWR cards. Adding or replacing these cards can cause damage to the SuperLine Access Shelf when the shelf is energized.

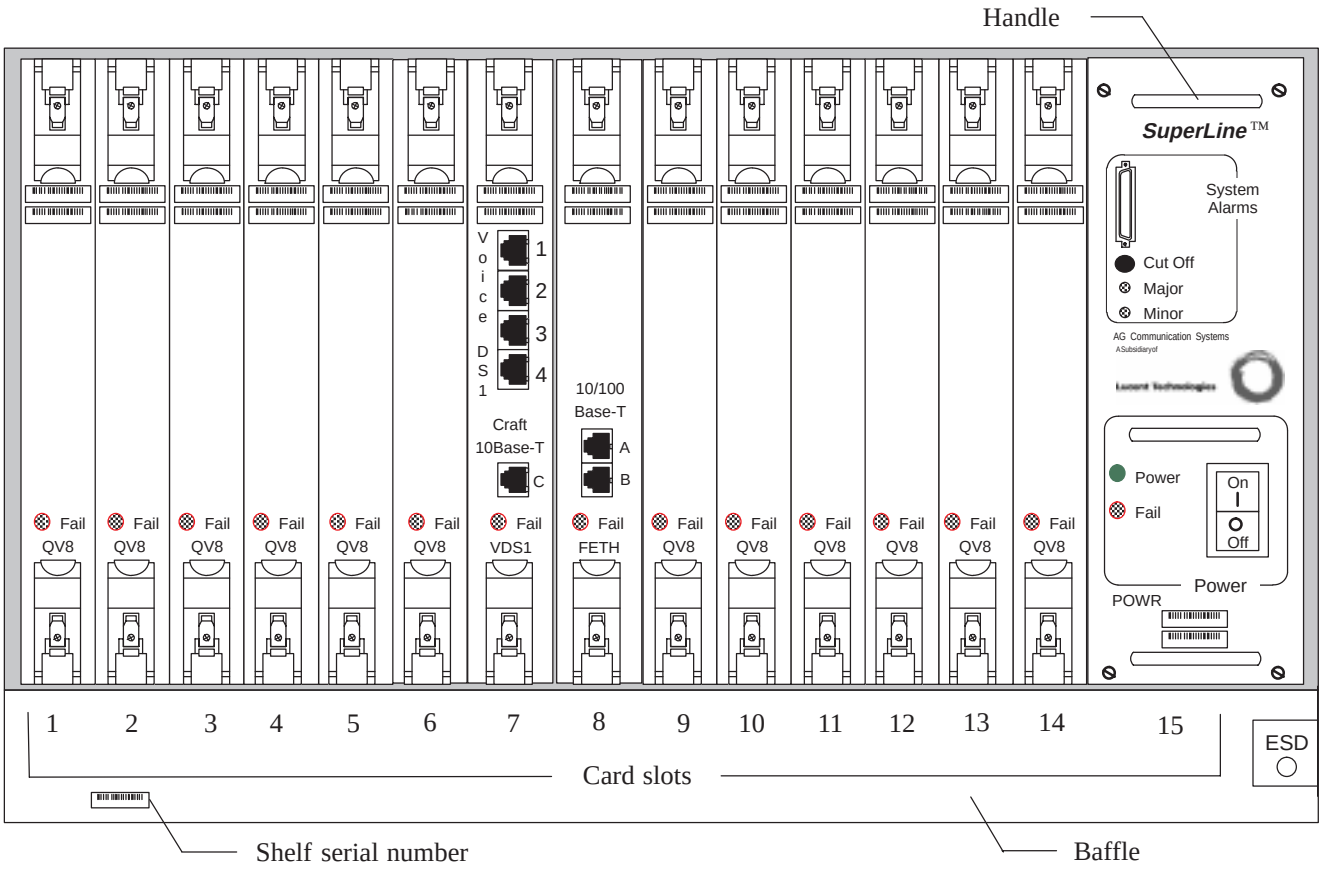
CAUTION

Electrostatic discharge (ESD) damage hazard

Attach an antistatic wrist strap and ground yourself to the ESD socket on the baffle of the SuperLine Access Shelf before working with shelf cards. Use static-dissipating work surfaces and antistatic bags for component storage. Electrostatic discharge can damage or destroy electronic components.

Card positions

The following figure depicts the card positions of a fully equipped *SuperLine* Access Shelf.



Inserting and removing shelf cards

Introduction

With the exception of the POWR card, shelf circuit cards have a latching mechanism that attaches the card securely to the upper and lower edges of the *SuperLine* Access Shelf. The latching mechanism includes a chrome lock release tab on the latch and a pair of grooved latch hooks on the back side of the latch (see figure **Shelf card latching mechanism**). Personnel must be careful to guide the latch hooks into the shelf's edge before closing the latch.

Important: The procedures in this topic are provided only as a preface to detailed instructions found later in this chapter on inserting and removing QV8, VDS1, and FETH cards.

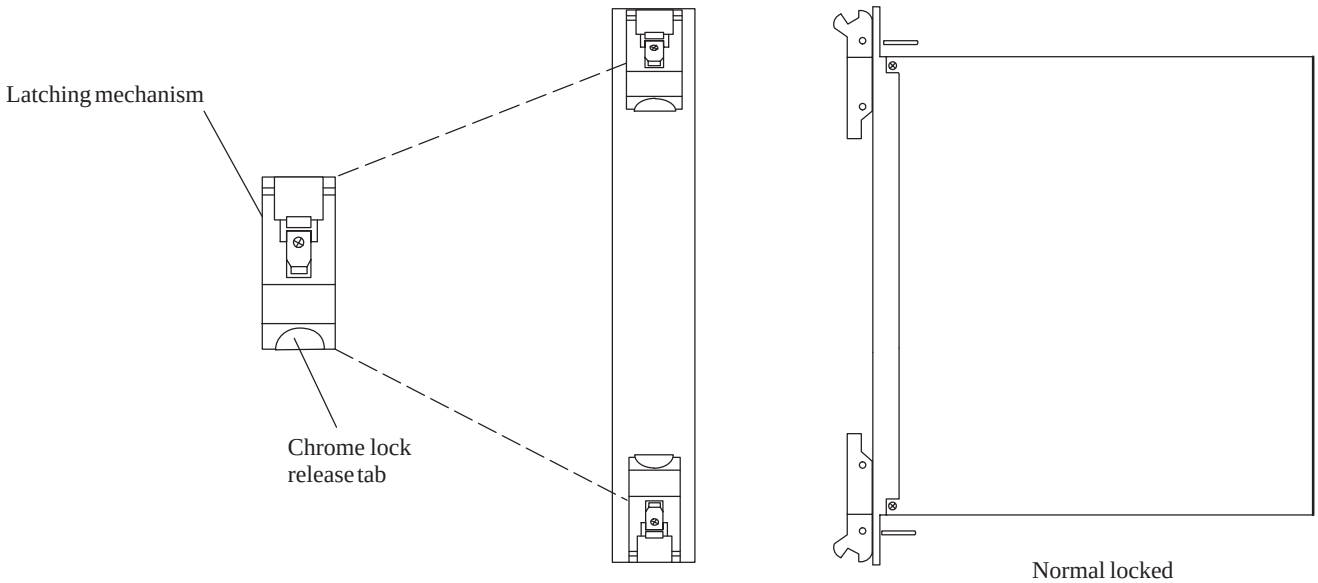
CAUTION

Bodily injury hazard

Avoid pulling or pushing bare hands on sharp metal edges when handling circuit cards. Failure to take adequate care when installing or removing circuit cards can result in bodily injury.

Shelf card latching mechanism

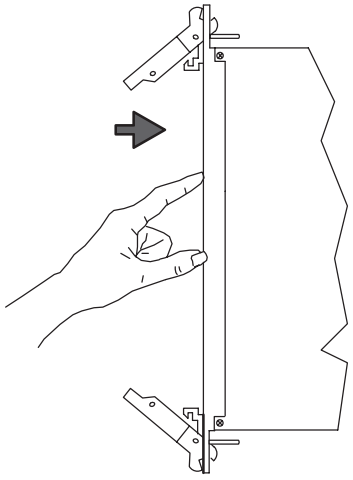
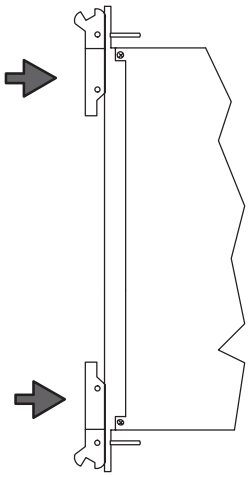
The following figure shows the front and side views of the latching mechanism in the locked position on the QV8, FETH, and VDS1 cards.



Inserting a card into the *SuperLine* Access Shelf

Use the following procedure to insert a QV8 card, VDS1, or FETH card into a *SuperLine* Access Shelf.

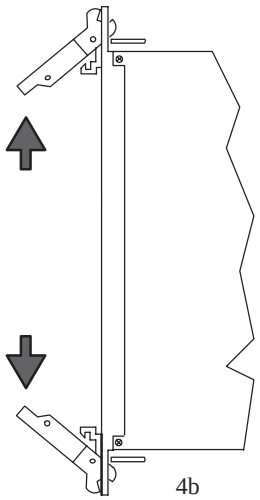
Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket on the shelf baffle before working with the cards.
2	If the card is a VDS1 or FETH card (but not a QV8 card; skip to step 3), take one of the following actions: **IF ...** — **THEN ...** the *SuperLine* Access Shelf is de-energized, — continue to step 3. the *SuperLine* Access Shelf is energized, — press the rocker switch on the POWR card to the Off position. Result: Power is removed from the *SuperLine* Access Shelf.
3	Install the card into the shelf: a. Make sure the latches are in the open position; that is, latches point out from card instead of lying snugly against it. b. Align the card with the upper and lower plastic card guides in the card shelf. c. Carefully insert the card into the plastic card guides, making sure that the top and bottom edges of the card are parallel to the plastic card guides.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3
cont’d</td><td>d. Push card into the shelf until resistance is felt (just short of full insertion into the backplane connector).
e. Simultaneously press both latches toward the face of the card with equal force until the latches lie snug against the card in the closed position.</td></tr>
<tr><td colspan="2"> 
3d
 
3e</td></tr>
<tr><td>4</td><td>As necessary, connect any cables to the front of the VDS1 and FETH cards.</td></tr>
<tr><td>5</td><td>Take one of the following actions:
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>the SuperLine Access Shelf is de-energized (VDS1 and FETH card),</td><td>press the rocker switch on the POWR card to the On position to initialize the cards (LEDs light).</td></tr>
<tr><td>the SuperLine Access Shelf is energized (QV8 card),</td><td>the QV8 card(s) start to initialize (LEDs light).</td></tr>
</table></td></tr>
</table>

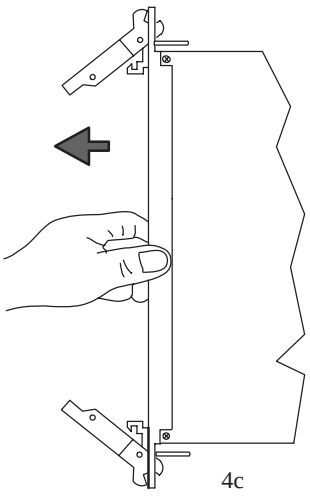
Removing a card from the *SuperLine* Access Shelf

Use the following procedure to remove a QV8 card, VDS1, or FETH card from a *SuperLine* Access Shelf.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket before working with the cards.
2	If the card is a VDS1 or FETH card (but not a QV8 card; skip to step 3), take one of the following actions: **IF ...** / **THEN ...** the *SuperLine* Access Shelf is de-energized, / continue to step 3. the *SuperLine* Access Shelf is energized, / press the rocker switch on the POWR card to the Off position. Result: Power is removed from the *SuperLine* Access Shelf.
3	Disconnect any cables attached to the front of the card being removed.
4	De-install the card from the shelf: a. Depress the chrome lock release tabs on each latch with your fingers. b. With the release tabs still depressed, simultaneously lift both latches away from the card's face with equal force until the card unseats itself from the backplane connector. c. Pull the card from the shelf.



4b



4c

□

Adding a QV8 card

Procedure Use the following procedure to add a QV8 card to the *SuperLine* Access Shelf.

Important:

1. QV8 cards support as many as eight subscribers with up to two derived lines each.
2. QV8 cards are hot swappable; that is, they can be inserted into or removed from the *SuperLine* Access Shelf while the shelf is energized without causing damage to the other cards or interrupting shelf service on the other QV8 cards.
3. Insert only the number of cards required to support subscriber lines.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Insert and secure each line line card into the *SuperLine* Access Shelf. (See the **Card positions** figure in the Introduction to this chapter for an illustration of *SuperLine* Access Shelf card placement.)
3	Take one of the following actions after all QV8 cards are inserted into the shelf:

IF ...	THEN ...
the *SuperLine* Access Shelf is de-energized,	press the rocker switch on the POWR card to the On position to initialize the QV8 cards (Fail LEDs light).
the *SuperLine* Access Shelf is energized,	the QV8 cards start to initialize (Fail LEDs light).

4	Verify that QV8 cards added to the *SuperLine* Access Shelf are initialized by observing that their Fail LEDs are no longer lighted (approximately 5 minutes from start of initialization).

□

Replacing a QV8 card

Procedure Use the following procedure to replace a QV8 card in the *SuperLine* Access Shelf.

Important:

1. QV8 cards support as many as eight subscribers with up to two derived lines each.
2. QV8 cards are hot swappable; that is, they can be inserted into or removed from the *SuperLine* Access Shelf while the shelf is energized without causing damage to the other cards or interrupting shelf service on the other QV8 cards.

CAUTION

Service interruption hazard

Replacing a QV8 card affects the service of up to 16 derived lines. Refer to your company's standard procedure for taking lines out of service before replacing a QV8 card.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Unlock the latching mechanisms at each end of the QV8 card and remove the card from its slot in the shelf.
3	Unlock the release tabs on the replacement QV8 card and put the latches in the unlocked position.
4	Insert and secure (latch) the new QV8 card into the empty card slot in the *SuperLine* Access Shelf.
5	Take one of the following actions after all defective QV8 cards have been replaced in the shelf:

IF ...	THEN ...
the *SuperLine* Access Shelf is de-energized,	press the rocker switch on the POWR card to the On position to initialize the newly inserted QV8 cards (Fail LEDs light).
the *SuperLine* Access Shelf is energized,	the newly inserted QV8 cards start to initialize (Fail LEDs light).

Step	Action
6	Verify that newly inserted QV8 cards are initialized by observing that their Fail LEDs are no longer lighted (approximately 5 minutes from start of initialization).

□

Replacing the VDS1 card

Procedure

This procedure requires you to use the *SuperLine* Element Manager, as well as the *SuperLine Access System Element Manager User's Guide*, to view and save *SuperLine* Access Shelf data.

Use the following procedure to replace the VDS1 card in the *SuperLine* Access Shelf.

CAUTION
Equipment damage hazard

Remove power to the shelf by pressing the rocker switch on the POWR card to the Off position before replacing the VDS1 card. Failure to do so can cause damage to the equipment.

CAUTION
Service interruption hazard

Removing power from the shelf disrupts all SuperLine Access Shelf services but does not affect baseband service. Replacing the VDS1 card will affect up to 192 derived lines. Therefore, take precautions to minimize the effects on users when replacing a VDS1 card.

Step	Action
1	Using the Element Manager, record all provisioning (writable) data in the following tab screens: • System • IP Routing • Telephony • *SuperLine* Integrated Access Device
2	Attach an antistatic wrist strap and ground yourself to the ESD socket.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Take one of the following actions:
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>the SuperLine Access Shelf is de-energized,</td><td>continue to step 4.</td></tr>
<tr><td>the SuperLine Access Shelf is energized,</td><td>press the rocker switch on the POWR card to the Off position.</td></tr>
</table></td></tr>
<tr><td>4</td><td>Disconnect and remove the 10Base-T and DS1 cables connected to the front of the VDS1 card.</td></tr>
<tr><td>5</td><td>Unlock the latching mechanisms at each end of the VDS1 card and remove the card from its slot in the shelf.</td></tr>
<tr><td>6</td><td>Unlock the release tabs on the replacement VDS1 card and put the latches in the unlocked position.</td></tr>
<tr><td>7</td><td>Insert and secure (latch) a new VDS1 card into the empty VDS1 card slot in the SuperLine Access Shelf. See the Card positions figure in the Introduction to this chapter for an illustration of shelf card placement.</td></tr>
<tr><td>8</td><td>Press the rocker switch on the POWR card to the On position.
Results:
• The SuperLine Access Shelf module initializes.
• All Fail LEDs, with the exception of the POWR card’s, are lighted until the shelf completes initialization.</td></tr>
<tr><td>9</td><td>Verify that newly inserted VDS1 cards are initialized by observing that their Fail LEDs are no longer lighted (approximately 5 minutes from start of initialization).</td></tr>
<tr><td>10</td><td>a. Reconnect the 10Base-T and DS1 cables to the front of the VDS1 card.
b. Verify that the green Link Integrity LED is lit on the Craft 10Base-T port.
c. Verify that the red Local alarm LED is extinguished for every DS1 cable inserted into a Voice DS1 port.</td></tr>
<tr><td>11</td><td>Use the Element Manager to reprovision the shelf using data recorded in step 1.</td></tr>
<tr><td>12</td><td>Use the Element Manager to reset the shelf, thereby allowing the acceptance of the new provisioning parameters.</td></tr>
</table>

□

Replacing the FETH card

Procedure Use the following procedure to replace a FETH card in the *SuperLine* Access Shelf.

CAUTION
Equipment damage hazard

Remove power to the shelf by pressing the rocker switch on the POWR card to the Off position before replacing the FETH card. Failure to do so can cause damage to the equipment.

CAUTION
Service interruption hazard

Removing power from the shelf disrupts all SuperLine Access Shelf services but does not affect baseband service. Replacing the FETH card will affect up to 192 derived lines. Therefore, take precautions to minimize the effects on users when replacing a FETH card.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Take one of the following actions: **IF ...** / **THEN ...** the *SuperLine* Access Shelf is de-energized, / continue to step 3. the *SuperLine* Access Shelf is energized, / press the rocker switch on the POWR card to the Off position.

Step	Action
3	Disconnect and remove the 10/100Base-T cable(s) connected to the front of the FETH card.
4	Unlock the latching mechanisms at each end of the FETH card and remove the card from its slot in the shelf.
5	Unlock the release tabs on the replacement FETH card and put the latches in the unlocked position.
6	Insert and secure (latch) a new FETH card into the empty FETH card slot in the *SuperLine* Access Shelf. See the **Card positions** figure in the Introduction to this chapter for an illustration of shelf card placement.
7	Press the rocker switch on the POWR card to the On position. Results: • The *SuperLine* Access Shelf module is energized. • All Fail LEDs, with the exception of the POWR card's, are lighted until the shelf completes initialization.
8	Verify that the newly inserted FETH card is initialized by observing that its Fail LED is no longer lighted (approximately 5 minutes from start of initialization).
9	a. Reconnect the 10/100Base-T cable(s) to the front of the FETH card. b. Verify that the green Link Integrity LED is lighted for every cable.

□

Replacing the POWR card

Procedure Use the following procedure to replace the POWR card in the *SuperLine* Access Shelf.

CAUTION
Equipment damage hazard

Remove power to the shelf by pressing the rocker switch on the POWR card to the Off position before replacing the POWR card. Failure to do so can cause damage to the equipment.

CAUTION
Service interruption hazard

Powering off the shelf disrupts all SuperLine Shelf services but does not affect baseband service. Replacing the POWR card will affect up to 192 derived lines. Therefore, take precautions to minimize the effects on users when replacing a POWR card.

Step	Action
1	Attach an antistatic wrist strap and ground yourself to the ESD socket.
2	Take one of the following actions: **IF ...** / **THEN ...** the *SuperLine* Access Shelf is de-energized, / continue to step 3. the *SuperLine* Access Shelf is energized, / press the rocker switch on the POWR card to the Off position.

Step	Action
3	Loosen the upper and lower screws on the front panel of the POWR card.
4	Disconnect the alarm cable connector by pressing the side latches.
5	Using the handles located on the POWR card, pull the card from its slot in the shelf.
6	Insert the new POWR card and tighten the card's upper and lower screws.
7	Reconnect the alarm cable connector to the POWR card.
8	Press the rocker switch on the POWR card to the On position. Results: • The system reinitializes (may take up to 5 minutes). • The green Power LED is lighted. After initialization, the Fail LED is extinguished. The status of the Major and Minor system alarm LEDs depends on the shelf alarms.

□

Replacing a *SuperLine* POTS filter card

Procedure Use the following procedure to replace a *SuperLine* POTS filter card in the *SuperLine* POTS Filter Module. The figure **Front view of SPFM** at the end of this procedure is provided for orientation.

CAUTION

Service interruption hazard

Replacing a SuperLine POTS filter card in the SPFM affects up to 24 baseband voice and associated derived lines and data connections. To minimize the disruption to baseband service, remove the Central Office Equipment cable and the External Facilities cable from the SPFC being serviced and temporarily connect them together as described in this procedure. Make sure no baseband voice lines are connected to emergency facilities (for example, 911) before doing this procedure. Follow your company's standard procedure for taking active lines out of service.

CAUTION

Strap fastener damage

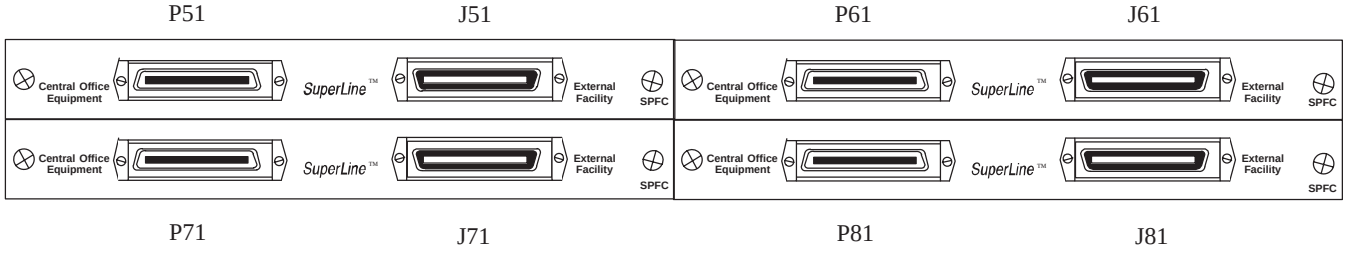
Strap fasteners are used to tie CO Equipment and External Facility cables to the SPFM. When removing the fasteners, be careful to pull the fasteners straight out from the equipment, not to the side. Pulling to the side may tear the fastener.

Step	Action
1	Remove the strap fasteners from the CO Equipment cable and the External Facilities cable of the SPFC(s) being serviced.
2	Disconnect the CO Equipment cable and the External Facilities cable from the SPFC(s) being serviced.

Step	Action
3	Depending on the SPFC(s) being serviced, connect the two cables as follows: • P51 to J51 • P61 to J61 • P71 to J71 • P81 to J81
4	a. Loosen the two front panel mounting screws from the affected SPFC. b. Pull the defective SPFC from the SPFM.
5	a. Insert the new SPFC into the SPFM. b. Carefully seat the card. c. Tighten the mounting screws on the affected SPFC.
6	Disconnect the CO Equipment and External Facilities cables from each other. Result: This action briefly disrupts baseband service.
7	Reconnect the CO Equipment and External Facilities cables to the SPFC and secure them with the strap fasteners.

Front view of SPFM

The *SuperLine* POTS Filter Module contains four *SuperLine* POTS filter cards. Each SPFC has a CO Equipment and an External Facilities 50-pin connector.



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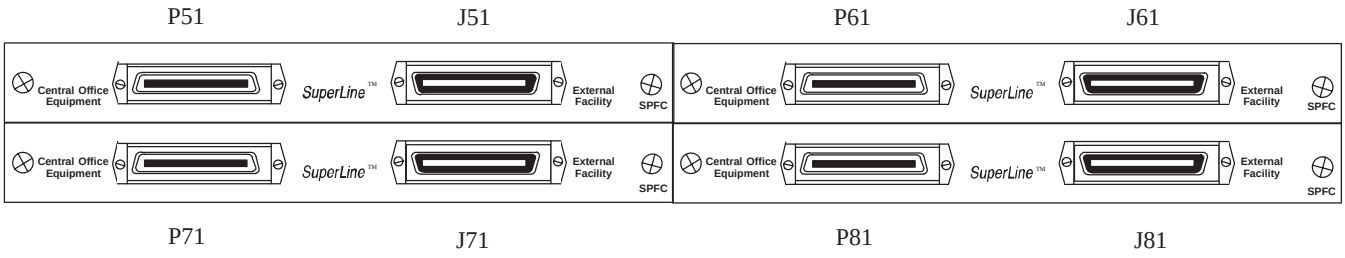
Appendix A: SPFM front panel pin assignments

Introduction

This appendix documents the tip and ring pin assignments for each connector on the front panel of the AG Communication Systems *SuperLine*™ POTS Filter Module (SPFM) (see figure). The *SuperLine* Access Shelf uses standard 25-pair color coding. However, to reduce potential cross-talk, user circuits do not present themselves in a standard order of appearance at the distribution frame, as shown in the figures on succeeding pages.

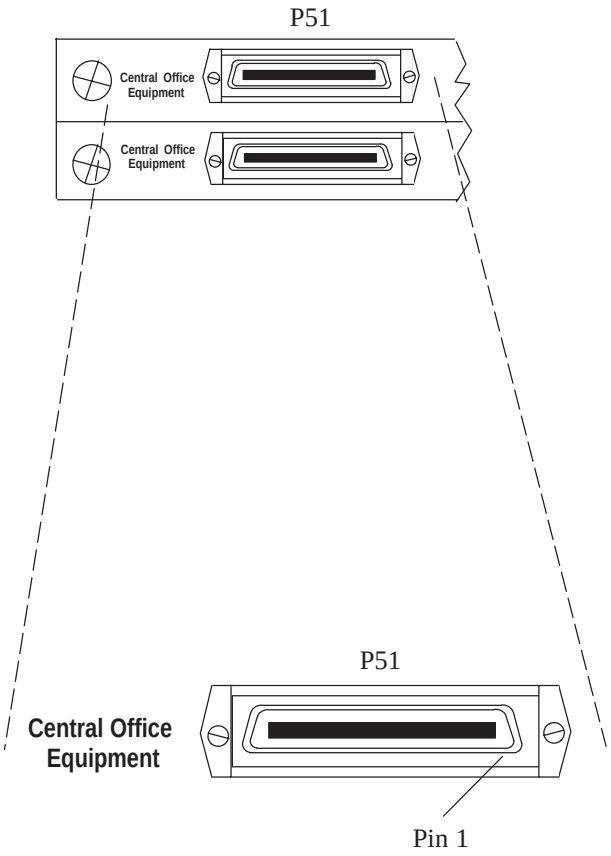
Front view of SPFM

The *SuperLine* POTS Filter Module contains four *SuperLine* POTS filter cards (SPFCs). Each SPFC has a 50-pin CO Equipment connector, labeled P51, P61, P71, and P81 in the figure, and a 50-pin External Facilities connector, labeled J51, J61, J71, and J81.



SPFM connector, P51 CO Equipment

Tip and ring pin assignments for baseband voice (POTS) lines on P51 connector are shown in the following figure.

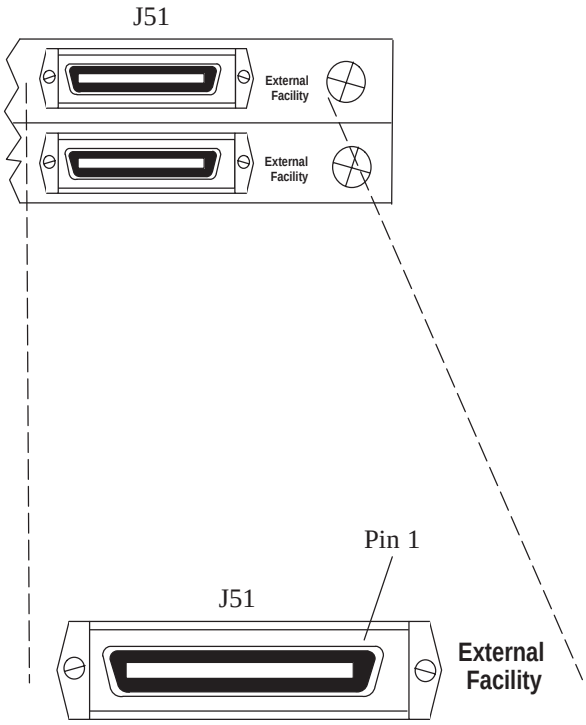


LINE CARD 1	POTS 01	T	26	01	POTS 01	R
	POTS 02	T	27	02	POTS 02	R
	POTS 03	T	28	03	POTS 03	R
	POTS 04	T	29	04	POTS 04	R
LINE CARD 2	POTS 09	T	30	05	POTS 09	R
	POTS 10	T	31	06	POTS 10	R
	POTS 11	T	32	07	POTS 11	R
	POTS 12	T	33	08	POTS 12	R
LINE CARD 3	POTS 17	T	34	09	POTS 17	R
	POTS 18	T	35	10	POTS 18	R
	POTS 19	T	36	11	POTS 19	R
	POTS 20	T	37	12	POTS 20	R
LINE CARD 4	POTS 25	T	38	13	POTS 25	R
	POTS 26	T	39	14	POTS 26	R
	POTS 27	T	40	15	POTS 27	R
	POTS 28	T	41	16	POTS 28	R
LINE CARD 5	POTS 33	T	42	17	POTS 33	R
	POTS 34	T	43	18	POTS 34	R
	POTS 35	T	44	19	POTS 35	R
	POTS 36	T	45	20	POTS 36	R
LINE CARD 6	POTS 41	T	46	21	POTS 41	R
	POTS 42	T	47	22	POTS 42	R
	POTS 43	T	48	23	POTS 43	R
	POTS 44	T	49	24	POTS 44	R
			50	25		

LEGEND:
R = ring
T = tip

SPFM connector, J51 External Facility

Tip and ring pin assignments for External Facility loops on J51 connector are shown in the following figure.

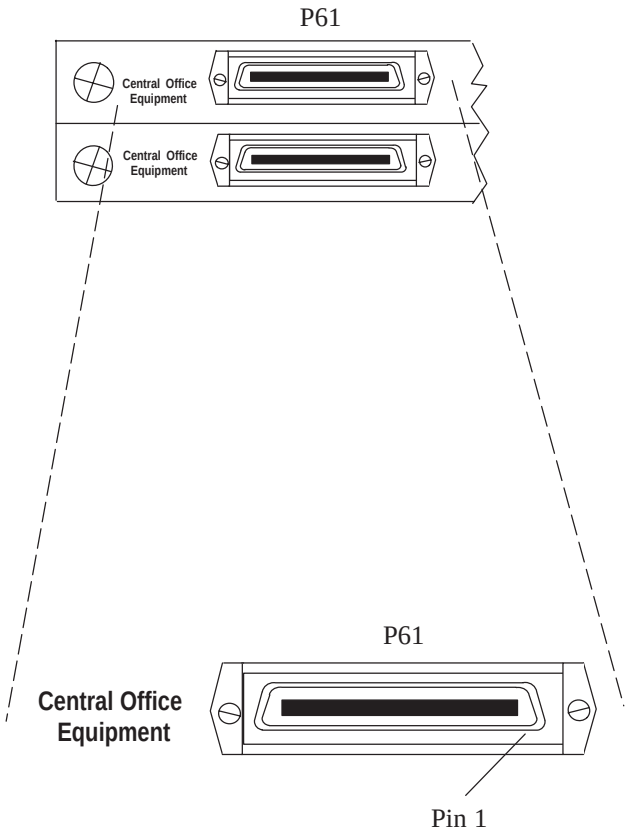


				50	25		
LINE CARD 6	Ckt	44	T	49	24	Ckt 44 R	
	Ckt	43	T	48	23	Ckt 43 R	
	Ckt	42	T	47	22	Ckt 42 R	
	Ckt	41	T	46	21	Ckt 41 R	
LINE CARD 5	Ckt	36	T	45	20	Ckt 36 R	
	Ckt	35	T	44	19	Ckt 35 R	
	Ckt	34	T	43	18	Ckt 34 R	
	Ckt	33	T	42	17	Ckt 33 R	
LINE CARD 4	Ckt	28	T	41	16	Ckt 28 R	
	Ckt	27	T	40	15	Ckt 27 R	
	Ckt	26	T	39	14	Ckt 26 R	
	Ckt	25	T	38	13	Ckt 25 R	
LINE CARD 3	Ckt	20	T	37	12	Ckt 20 R	
	Ckt	19	T	36	11	Ckt 19 R	
	Ckt	18	T	35	10	Ckt 18 R	
	Ckt	17	T	34	09	Ckt 17 R	
LINE CARD 2	Ckt	12	T	33	08	Ckt 12 R	
	Ckt	11	T	32	07	Ckt 11 R	
	Ckt	10	T	31	06	Ckt 10 R	
	Ckt	09	T	30	05	Ckt 09 R	
LINE CARD 1	Ckt	04	T	29	04	Ckt 04 R	
	Ckt	03	T	28	03	Ckt 03 R	
	Ckt	02	T	27	02	Ckt 02 R	
	Ckt	01	T	26	01	Ckt 01 R	

LEGEND:
Ckt = External Facility loop
R = ring
T = tip

SPFM connector, P61 CO Equipment

Tip and ring pin assignments for baseband voice (POTS) lines on P61 connector are shown in the following figure.

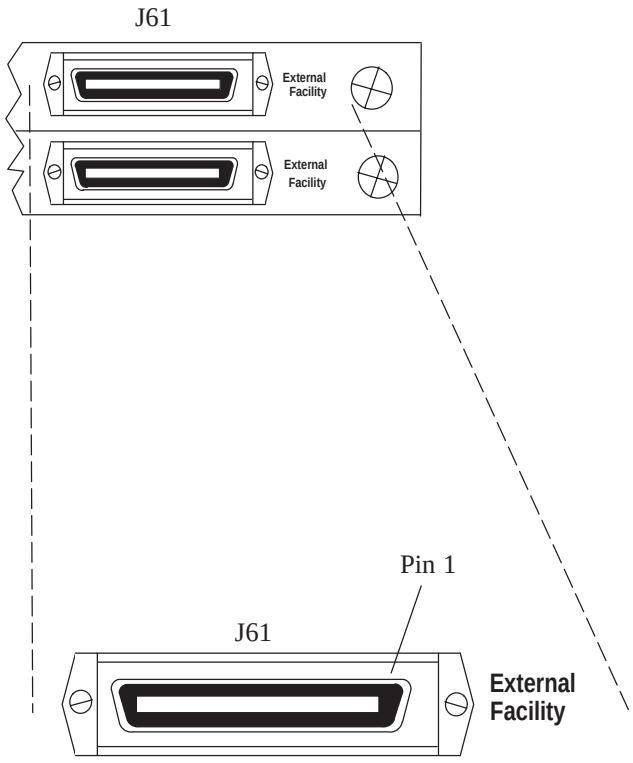


LINE CARD 7	POTS 49 T	26	01	POTS 49 R
	POTS 50 T	27	02	POTS 50 R
	POTS 51 T	28	03	POTS 51 R
	POTS 52 T	29	04	POTS 52 R
LINE CARD 8	POTS 57 T	30	05	POTS 57 R
	POTS 58 T	31	06	POTS 58 R
	POTS 59 T	32	07	POTS 59 R
	POTS 60 T	33	08	POTS 60 R
LINE CARD 9	POTS 65 T	34	09	POTS 65 R
	POTS 66 T	35	10	POTS 66 R
	POTS 67 T	36	11	POTS 67 R
	POTS 68 T	37	12	POTS 68 R
LINE CARD 10	POTS 73 T	38	13	POTS 73 R
	POTS 74 T	39	14	POTS 74 R
	POTS 75 T	40	15	POTS 75 R
	POTS 76 T	41	16	POTS 76 R
LINE CARD 11	POTS 81 T	42	17	POTS 81 R
	POTS 82 T	43	18	POTS 82 R
	POTS 83 T	44	19	POTS 83 R
	POTS 84 T	45	20	POTS 84 R
LINE CARD 12	POTS 89 T	46	21	POTS 89 R
	POTS 90 T	47	22	POTS 90 R
	POTS 91 T	48	23	POTS 91 R
	POTS 92 T	49	24	POTS 92 R
		50	25	

LEGEND:
R = Ring
T = Tip

SPFM connector, J61 External Facility

Tip and ring pin assignments for External Facility loops on J61 connector are shown in the following figure.

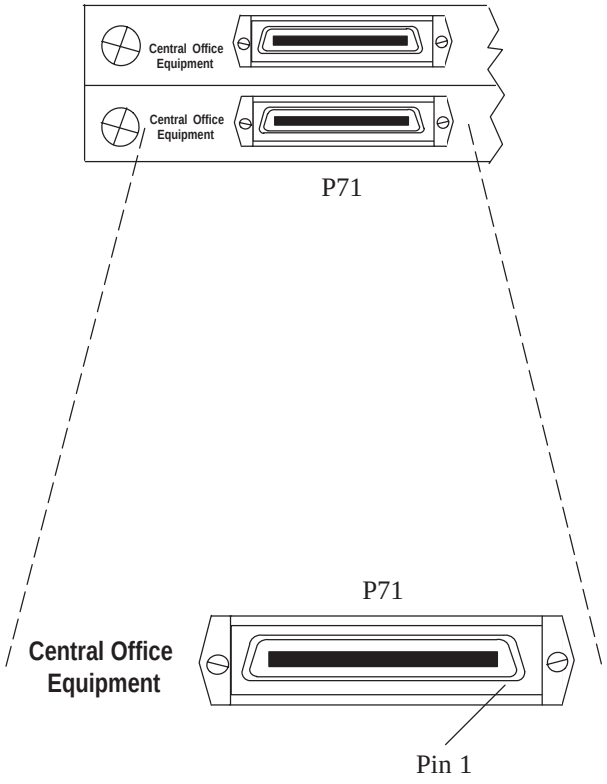


LINE CARD 12	Ckt 92 T	50	25	
	Ckt 91 T	49	24	Ckt 92 R
	Ckt 90 T	48	23	Ckt 91 R
	Ckt 89 T	47	22	Ckt 90 R
LINE CARD 11	Ckt 84 T	46	21	Ckt 89 R
	Ckt 83 T	45	20	Ckt 84 R
	Ckt 82 T	44	19	Ckt 83 R
	Ckt 81 T	43	18	Ckt 82 R
LINE CARD 10	Ckt 76 T	42	17	Ckt 81 R
	Ckt 75 T	41	16	Ckt 76 R
	Ckt 74 T	40	15	Ckt 75 R
	Ckt 73 T	39	14	Ckt 74 R
LINE CARD 9	Ckt 68 T	38	13	Ckt 73 R
	Ckt 67 T	37	12	Ckt 68 R
	Ckt 66 T	36	11	Ckt 67 R
	Ckt 65 T	35	10	Ckt 66 R
LINE CARD 8	Ckt 60 T	34	09	Ckt 65 R
	Ckt 59 T	33	08	Ckt 60 R
	Ckt 58 T	32	07	Ckt 59 R
	Ckt 57 T	31	06	Ckt 58 R
LINE CARD 7	Ckt 52 T	30	05	Ckt 57 R
	Ckt 51 T	29	04	Ckt 52 R
	Ckt 50 T	28	03	Ckt 51 R
	Ckt 49 T	27	02	Ckt 50 R
		26	01	Ckt 49 R

LEGEND:
Ckt = External Facility loop
R = ring
T = tip

SPFM connector, P71 CO Equipment

Tip and ring pin assignments for baseband voice (POTS) lines on P71 connector are shown in the following figure.

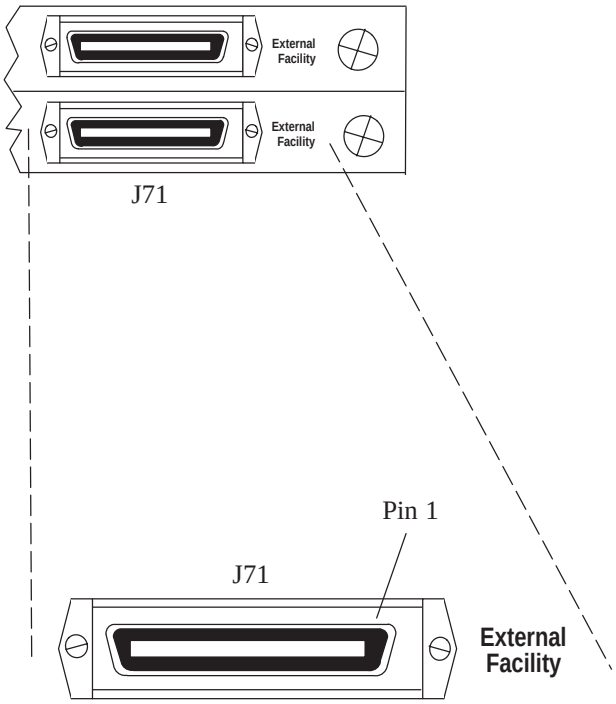


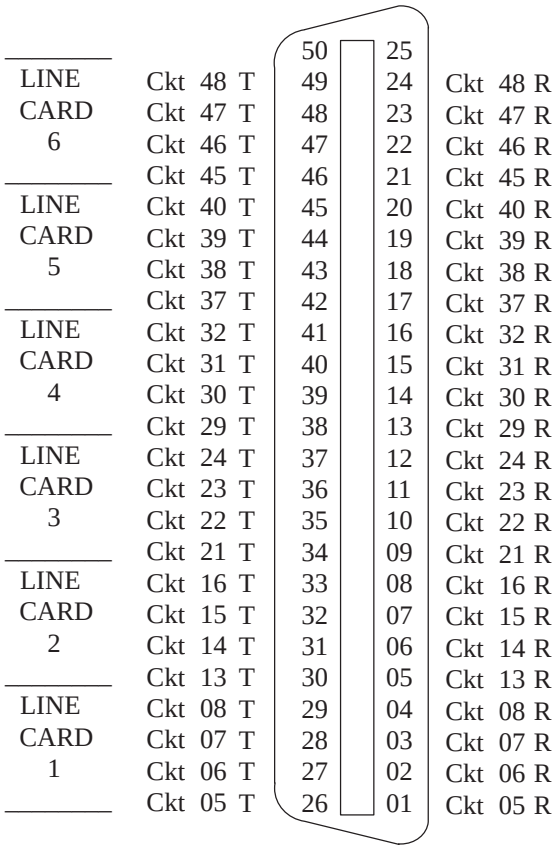
LINE CARD 1	POTS 05 T	26	01	POTS 05 R
	POTS 06 T	27	02	POTS 06 R
	POTS 07 T	28	03	POTS 07 R
	POTS 08 T	29	04	POTS 08 R
LINE CARD 2	POTS 13 T	30	05	POTS 13 R
	POTS 14 T	31	06	POTS 14 R
	POTS 15 T	32	07	POTS 15 R
	POTS 16 T	33	08	POTS 16 R
LINE CARD 3	POTS 21 T	34	09	POTS 21 R
	POTS 22 T	35	10	POTS 22 R
	POTS 23 T	36	11	POTS 23 R
	POTS 24 T	37	12	POTS 24 R
LINE CARD 4	POTS 29 T	38	13	POTS 29 R
	POTS 30 T	39	14	POTS 30 R
	POTS 31 T	40	15	POTS 31 R
	POTS 32 T	41	16	POTS 32 R
LINE CARD 5	POTS 37 T	42	17	POTS 37 R
	POTS 38 T	43	18	POTS 38 R
	POTS 39 T	44	19	POTS 39 R
	POTS 40 T	45	20	POTS 40 R
LINE CARD 6	POTS 45 T	46	21	POTS 45 R
	POTS 46 T	47	22	POTS 46 R
	POTS 47 T	48	23	POTS 47 R
	POTS 48 T	49	24	POTS 48 R
		50	25	

LEGEND:
R = ring
T = tip

SPFM connector, J71 External Facility

Tip and ring pin assignments for External Facility loops on J71 connector are shown in the following figure.

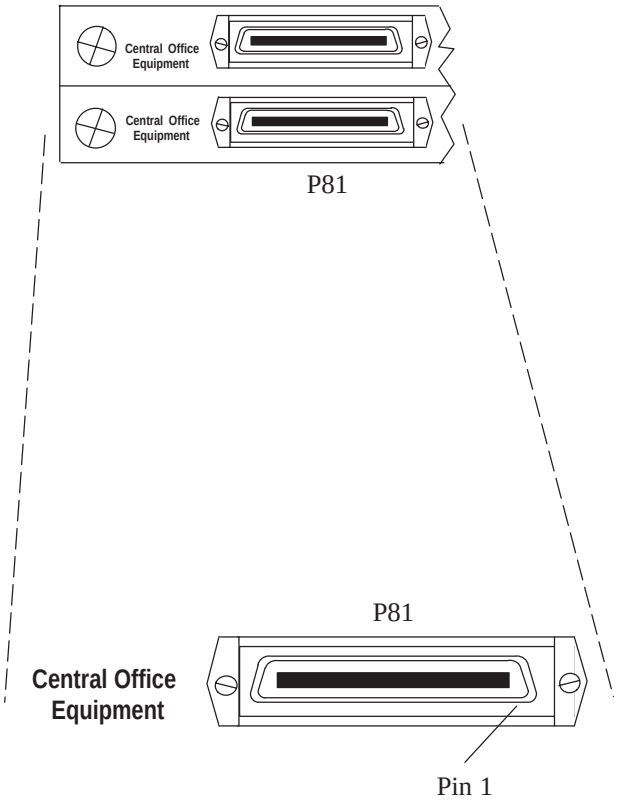




LEGEND:
Ckt = External Facility loop
R = ring
T = tip

SPFM connector, P81 CO Equipment

Tip and ring pin assignments for baseband voice (POTS) lines on P81 connector are shown in the following figure.

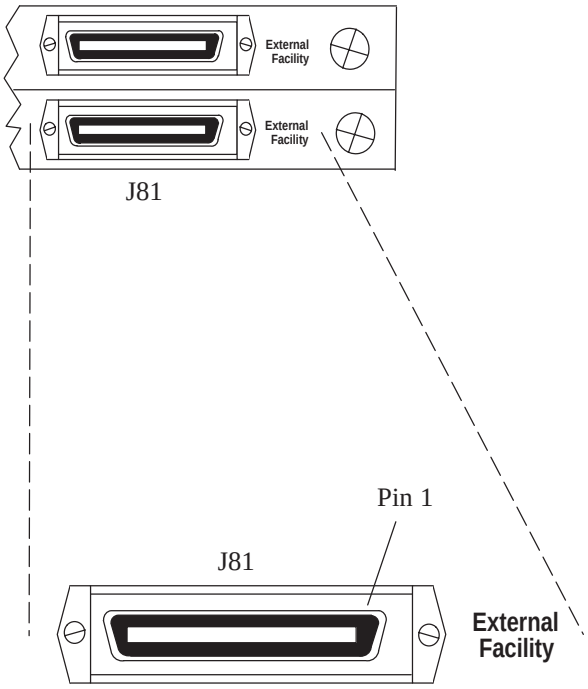


LINE CARD 7	POTS 53 T	26	01	POTS 53 R
	POTS 54 T	27	02	POTS 54 R
	POTS 55 T	28	03	POTS 55 R
	POTS 56 T	29	04	POTS 56 R
LINE CARD 8	POTS 61 T	30	05	POTS 61 R
	POTS 62 T	31	06	POTS 62 R
	POTS 63 T	32	07	POTS 63 R
	POTS 64 T	33	08	POTS 64 R
LINE CARD 9	POTS 69 T	34	09	POTS 69 R
	POTS 70 T	35	10	POTS 70 R
	POTS 71 T	36	11	POTS 71 R
	POTS 72 T	37	12	POTS 72 R
LINE CARD 10	POTS 77 T	38	13	POTS 77 R
	POTS 78 T	39	14	POTS 78 R
	POTS 79 T	40	15	POTS 79 R
	POTS 80 T	41	16	POTS 80 R
LINE CARD 11	POTS 85 T	42	17	POTS 85 R
	POTS 86 T	43	18	POTS 86 R
	POTS 87 T	44	19	POTS 87 R
	POTS 88 T	45	20	POTS 88 R
LINE CARD 12	POTS 93 T	46	21	POTS 93 R
	POTS 94 T	47	22	POTS 94 R
	POTS 95 T	48	23	POTS 95 R
	POTS 96 T	49	24	POTS 96 R
		50	25	

LEGEND
R = ring
T = tip

SPFM connector, J81 External Facility

Tip and ring pin assignments for External Facility loops on J81 connector are shown in the following figure.



			50	25	
LINE CARD 12	Ckt 96 T		49	24	Ckt 96 R
	Ckt 95 T		48	23	Ckt 95 R
	Ckt 94 T		47	22	Ckt 94 R
	Ckt 93 T		46	21	Ckt 93 R
LINE CARD 11	Ckt 88 T		45	20	Ckt 88 R
	Ckt 87 T		44	19	Ckt 87 R
	Ckt 86 T		43	18	Ckt 86 R
	Ckt 85 T		42	17	Ckt 85 R
LINE CARD 10	Ckt 80 T		41	16	Ckt 80 R
	Ckt 79 T		40	15	Ckt 79 R
	Ckt 78 T		39	14	Ckt 78 R
	Ckt 77 T		38	13	Ckt 77 R
LINE CARD 9	Ckt 72 T		37	12	Ckt 72 R
	Ckt 71 T		36	11	Ckt 71 R
	Ckt 70 T		35	10	Ckt 70 R
	Ckt 69 T		34	09	Ckt 69 R
LINE CARD 8	Ckt 64 T		33	08	Ckt 64 R
	Ckt 63 T		32	07	Ckt 63 R
	Ckt 62 T		31	06	Ckt 62 R
	Ckt 61 T		30	05	Ckt 61 R
LINE CARD 7	Ckt 56 T		29	04	Ckt 56 R
	Ckt 55 T		28	03	Ckt 55 R
	Ckt 54 T		27	02	Ckt 54 R
	Ckt 53 T		26	01	Ckt 53 R

LEGEND:
Ckt = External Facility loop
R = ring
T = tip

□

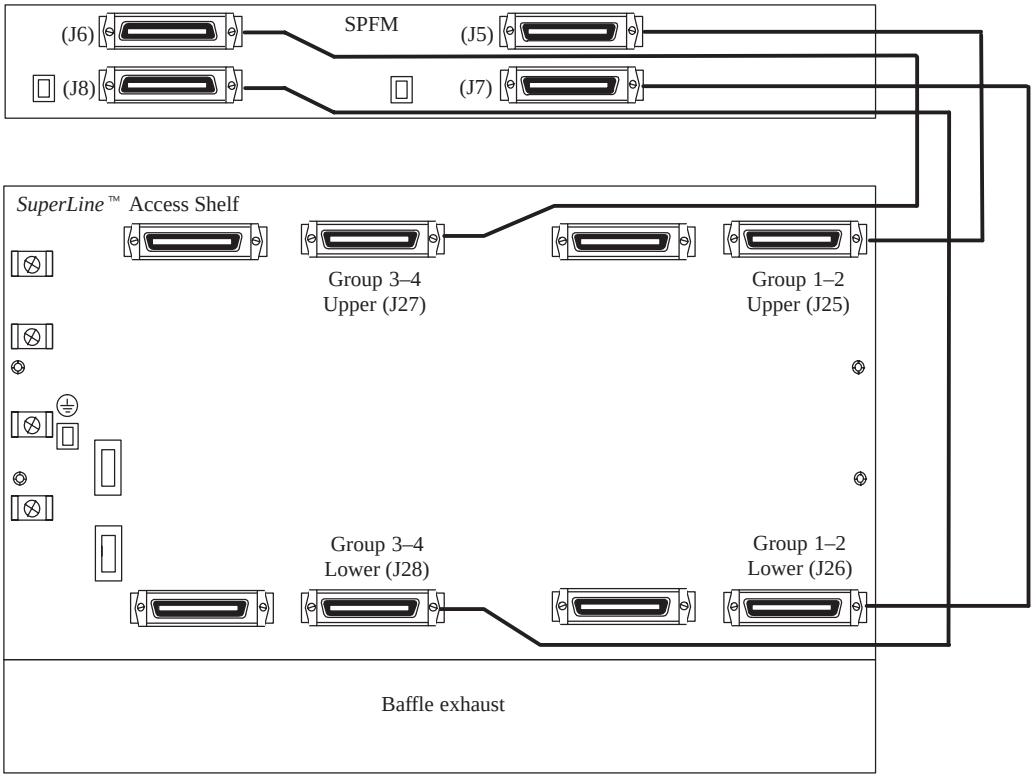
Appendix B: SPFM rear panel pin assignments

Introduction

This appendix documents the tip and ring pin assignments for each connector on the rear panel of the AG Communication Systems *SuperLine*™ POTS Filter Module (SPFM).

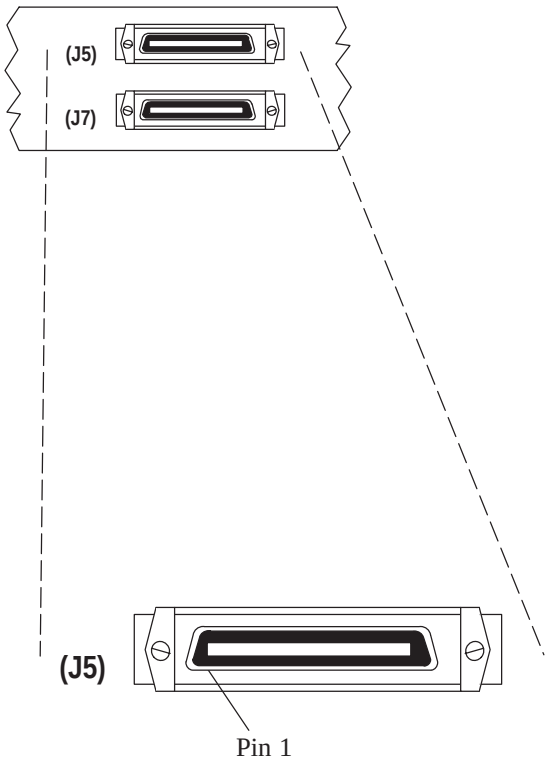
Rear view of SPFM with connections to shelf

Each 50-pin connector on the rear panel of the SPFM is cabled to a specific connector on the backplane of the *SuperLine* Access Shelf, as shown in the following figure.



SPFM connector, J5 diagram

Tip and ring pin assignments for the upper right connector on the rear panel of the SPFM are shown in the following figure.

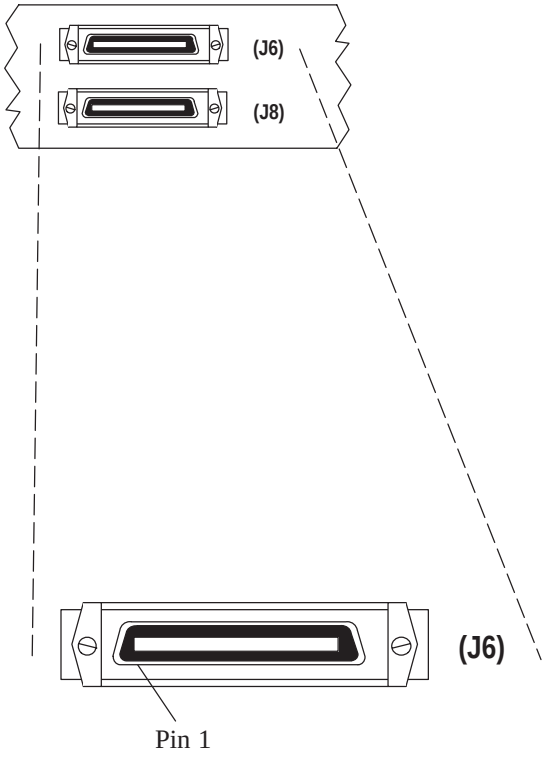


			50	25	
LINE CARD 6	SL 44 T		49	24	SL 44 R
	SL 43 T		48	23	SL 43 R
	SL 42 T		47	22	SL 42 R
	SL 41 T		46	21	SL 41 R
LINE CARD 5	SL 36 T		45	20	SL 36 R
	SL 35 T		44	19	SL 35 R
	SL 34 T		43	18	SL 34 R
	SL 33 T		42	17	SL 33 R
LINE CARD 4	SL 28 T		41	16	SL 28 R
	SL 27 T		40	15	SL 27 R
	SL 26 T		39	14	SL 26 R
	SL 25 T		38	13	SL 25 R
LINE CARD 3	SL 20 T		37	12	SL 20 R
	SL 19 T		36	11	SL 19 R
	SL 18 T		35	10	SL 18 R
	SL 17 T		34	06	SL 17 R
LINE CARD 2	SL 12 T		33	08	SL 12 R
	SL 11 T		32	07	SL 11 R
	SL 10 T		31	06	SL 10 R
	SL 09 T		30	05	SL 09 R
LINE CARD 1	SL 04 T		29	04	SL 04 R
	SL 03 T		28	03	SL 03 R
	SL 02 T		27	02	SL 02 R
	SL 01 T		26	01	SL 01 R

LEGEND:
R = ring
SL = SuperLine
T = tip

SPFM connector, J6 diagram

Tip and ring pin assignments for the upper left connector on the rear panel of the SPFM are shown in the following figure.

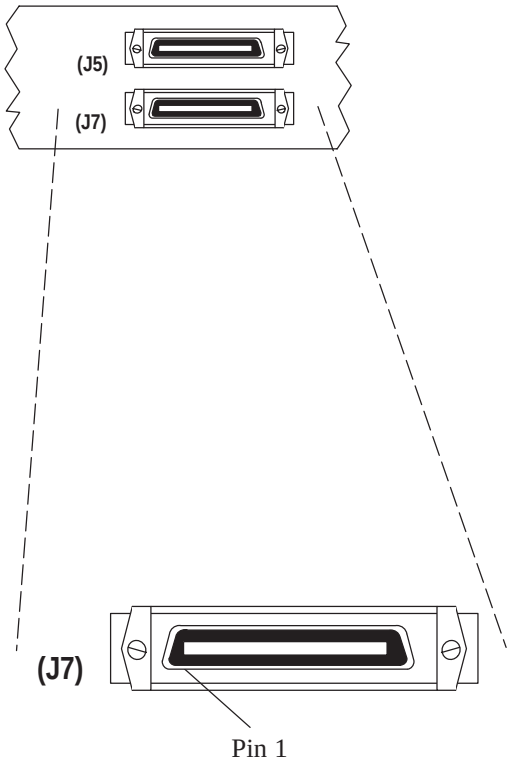


			50	25	
LINE CARD 12	SL 92 T		49	24	SL 92 R
	SL 91 T		48	23	SL 91 R
	SL 90 T		47	22	SL 90 R
	SL 89 T		46	21	SL 89 R
LINE CARD 11	SL 84 T		45	20	SL 84 R
	SL 83 T		44	19	SL 83 R
	SL 82 T		43	18	SL 82 R
	SL 81 T		42	17	SL 81 R
LINE CARD 10	SL 76 T		41	16	SL 76 R
	SL 75 T		40	15	SL 75 R
	SL 74 T		39	14	SL 74 R
	SL 73 T		38	13	SL 73 R
LINE CARD 9	SL 68 T		37	12	SL 68 R
	SL 67 T		36	11	SL 67 R
	SL 66 T		35	10	SL 66 R
	SL 65 T		34	06	SL 65 R
LINE CARD 8	SL 60 T		33	08	SL 60 R
	SL 59 T		32	07	SL 59 R
	SL 58 T		31	06	SL 58 R
	SL 57 T		30	05	SL 57 R
LINE CARD 7	SL 52 T		29	04	SL 52 R
	SL 51 T		28	03	SL 51 R
	SL 50 T		27	02	SL 50 R
	SL 49 T		26	01	SL 49 R

LEGEND:
R = ring
SL = SuperLine
T = tip

SPFM connector, J7 diagram

Tip and ring pin assignments for the lower right connector on the rear panel of the SPFM are shown in the following figure.

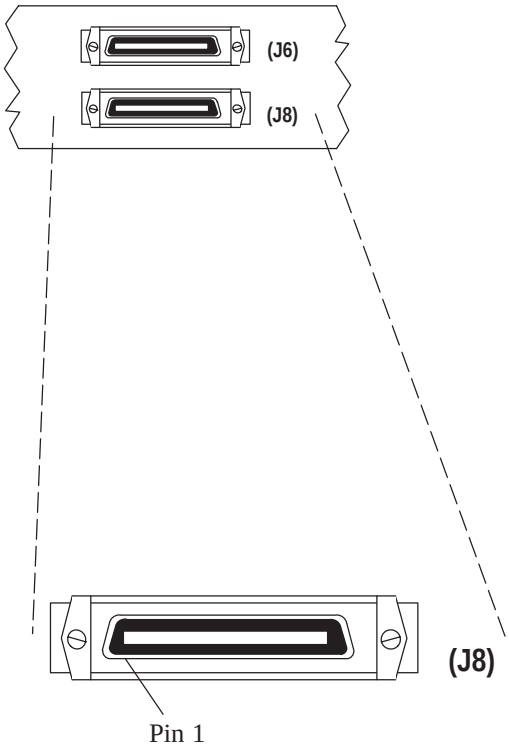


LINE CARD 6	SL 48 T	50	25	SL 48 R	
	SL 47 T	49	24	SL 47 R	
	SL 46 T	48	23	SL 46 R	
	SL 45 T	47	22	SL 45 R	
LINE CARD 5	SL 40 T	46	21	SL 40 R	
	SL 39 T	45	20	SL 39 R	
	SL 38 T	44	19	SL 38 R	
	SL 37 T	43	18	SL 37 R	
LINE CARD 4	SL 32 T	42	17	SL 32 R	
	SL 31 T	41	16	SL 31 R	
	SL 30 T	40	15	SL 30 R	
	SL 29 T	39	14	SL 29 R	
LINE CARD 3	SL 24 T	38	13	SL 24 R	
	SL 23 T	37	12	SL 23 R	
	SL 22 T	36	11	SL 22 R	
	SL 21 T	35	10	SL 21 R	
LINE CARD 2	SL 16 T	34	06	SL 16 R	
	SL 15 T	33	08	SL 15 R	
	SL 14 T	32	07	SL 14 R	
	SL 13 T	31	06	SL 13 R	
LINE CARD 1	SL 08 T	30	05	SL 08 R	
	SL 07 T	29	04	SL 07 R	
	SL 06 T	28	03	SL 06 R	
	SL 05 T	27	02	SL 05 R	
		26	01		

LEGEND:
R = ring
SL = SuperLine
T = tip

SPFM connector, J8 diagram

Tip and ring pin assignments for the lower left connector on the rear panel of the SPFM are shown in the following figure.



		50	25	
LINE CARD 12	SL 96 T	49	24	SL 96 R
	SL 95 T	48	23	SL 95 R
	SL 94 T	47	22	SL 94 R
	SL 93 T	46	21	SL 93 R
LINE CARD 11	SL 88 T	45	20	SL 88 R
	SL 87 T	44	19	SL 87 R
	SL 86 T	43	18	SL 86 R
	SL 85 T	42	17	SL 85 R
LINE CARD 10	SL 80 T	41	16	SL 80 R
	SL 79 T	40	15	SL 79 R
	SL 78 T	39	14	SL 78 R
	SL 77 T	38	13	SL 77 R
LINE CARD 9	SL 72 T	37	12	SL 72 R
	SL 71 T	36	11	SL 71 R
	SL 70 T	35	10	SL 70 R
	SL 69 T	34	06	SL 69 R
LINE CARD 8	SL 64 T	33	08	SL 64 R
	SL 63 T	32	07	SL 63 R
	SL 62 T	31	06	SL 62 R
	SL 61 T	30	05	SL 61 R
LINE CARD 7	SL 56 T	29	04	SL 56 R
	SL 55 T	28	03	SL 55 R
	SL 54 T	27	02	SL 54 R
	SL 53 T	26	01	SL 53 R

LEGEND:
R = ring
SL = SuperLine
T = tip

□

Appendix C: DS0 channel assignments for EM telephony configurations

Introduction

Important: You can set the telephony type for the *SuperLine*™ Access Shelf using the Telephony tab screen of the *SuperLine* Element Manager application. Refer to the *SuperLine Access System Element Manager User's Guide* for more information.

In TR-008 Mode 1 and DDI telephony modes, each derived phone line is mapped to a specific DS0—a channel within a DS1. In the TR-008 Mode 1 and DDI modes, the relationship between a derived phone line and a DS0 never varies. In TR-303 telephony mode, however, each derived phone line is mapped dynamically to a DS0 by the central office (CO) sending a message over the Timeslot Management Channel (TMC).

How to read the tables

Five telephony configurations are supported by the *SuperLine* Element Manager in the TR-008 Mode 1 and DDI telephony modes. They are as follows:

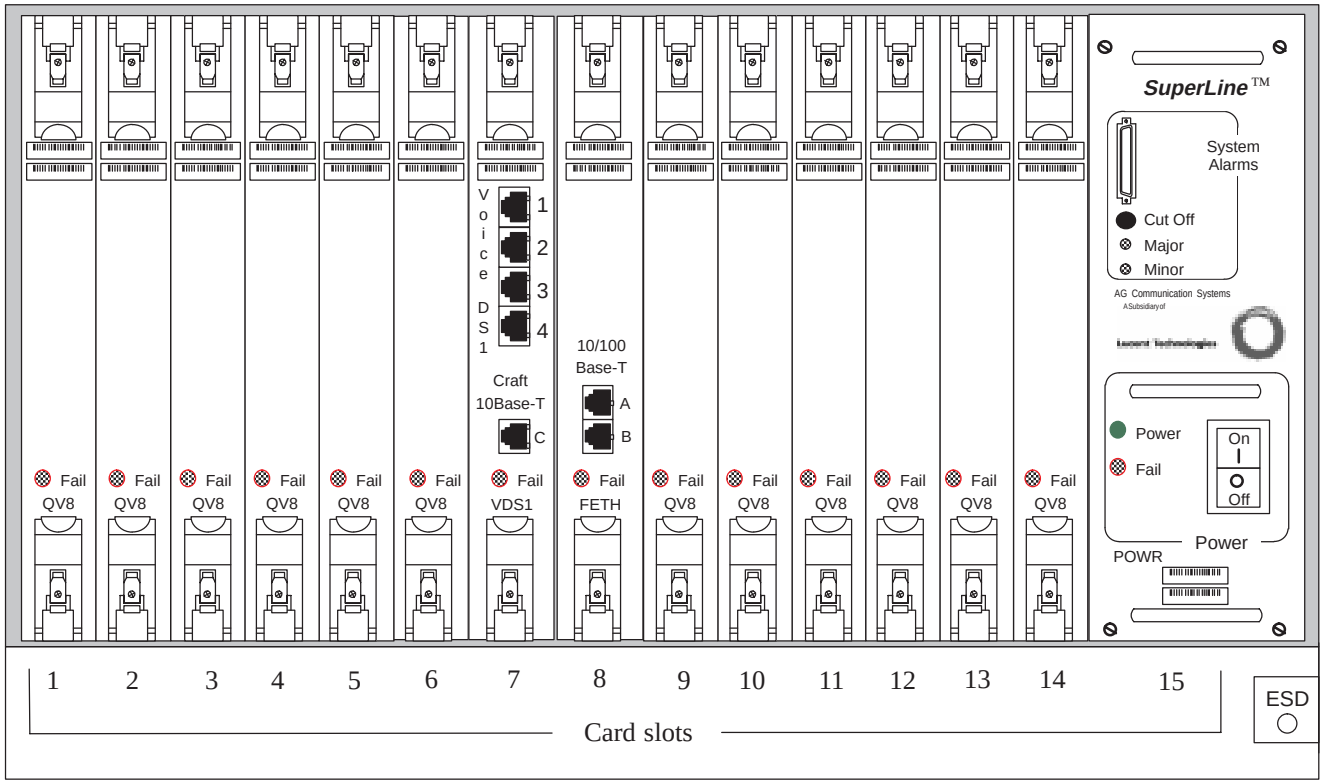
- 2 on Ports 1–4
- 2 on Slots 1–6
- 2, 1, 0 Repeated
- 1 on Slots 1–6, 2 on 9–11
- 1 on all Ports

The following tables list the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony. In columns DS1-1 through DS1-4, the first number refers to the QV8 card slot number; the second number to the QV8 circuit number; and the third number to the derived line number.

Example: On DS0 channel 3 for TR-008 Mode 1 telephony type, the mapping for DS1-1 is 1–1–2, meaning QV8 card slot 1, QV8 circuit 1, and derived line 2.

QV8 cards in a fully equipped *SuperLine* Access Shelf

The following figure shows a fully equipped *SuperLine* Access Shelf. The 12 QV8 cards are positioned in card slots 1–6 and 9–14. Other cards in the shelf are the VDS1 card in card slot 7, the FETH card in card slot 8, and the POWR card in card slot 15.



2 on Ports 1–4

In the Telephony tab screen of the *SuperLine* Element Manager, you can select this configuration from the **Derived Lines/Loop** drop-down list box as **2 on Ports 1–4**. When this option is selected, two derived lines are placed on ports 1–4 on all QV8 cards. Ports 5–8 have no derived lines available but can be used for data traffic and baseband telephony.

The following table lists the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony types in the format card slot number–circuit number–derived line number.

DS1-1	DS1-2	DS1-3	DS1-4	DS0 channels for TR-008 Mode 1	DS0 channels for DDI
1–1–1	4–1–1	9–1–1	12–1–1	1	1
1–1–2	4–1–2	9–1–2	12–1–2	3	2
1–2–1	4–2–1	9–2–1	12–2–1	5	3
1–2–2	4–2–2	9–2–2	12–2–2	7	4
1–3–1	4–3–1	9–3–1	12–3–1	9	5
1–3–2	4–3–2	9–3–2	12–3–2	11	6
1–4–1	4–4–1	9–4–1	12–4–1	13	7
1–4–2	4–4–2	9–4–2	12–4–2	15	8
2–1–1	5–1–1	10–1–1	13–1–1	17	9
2–1–2	5–1–2	10–1–2	13–1–2	19	10
2–2–1	5–2–1	10–2–1	13–2–1	21	11
2–2–2	5–2–2	10–2–2	13–2–2	23	12
2–3–1	5–3–1	10–3–1	13–3–1	2	13
2–3–2	5–3–2	10–3–2	13–3–2	4	14
2–4–1	5–4–1	10–4–1	13–4–1	6	15
2–4–2	5–4–2	10–4–2	13–4–2	8	16
3–1–1	6–1–1	11–1–1	14–1–1	10	17
3–1–2	6–1–2	11–1–2	14–1–2	12	18
3–2–1	6–2–1	11–2–1	14–2–1	14	19
3–2–2	6–2–2	11–2–2	14–2–2	16	20
3–3–1	6–3–1	11–3–1	14–3–1	18	21
3–3–2	6–3–2	11–3–2	14–3–2	20	22
3–4–1	6–4–1	11–4–1	14–4–1	22	23
3–4–2	6–4–2	11–4–2	14–4–2	24	24

2 on Slots 1–6

In the Telephony tab screen of the *SuperLine* Element Manager, you can select this configuration from the **Derived Lines/Loop** drop-down list box as **2 on Slots 1–6**. When this option is selected, two derived lines are placed on all ports found on the QV8 cards in card slots 1–6. QV8 cards in any other card slot have no derived lines available but can be used for data traffic and baseband telephony.

The following table lists the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony types in the format card slot number–circuit number–derived line number.

DS1-1	DS1-2	DS1-3	DS1-4	DS0 channels for TR-008 Mode 1	DS0 channels for DDI
1–1–1	2–5–1	4–1–1	5–5–1	1	1
1–1–2	2–5–2	4–1–2	5–5–2	3	2
1–2–1	2–6–1	4–2–1	5–6–1	5	3
1–2–2	2–6–2	4–2–2	5–6–2	7	4
1–3–1	2–7–1	4–3–1	5–7–1	9	5
1–3–2	2–7–2	4–3–2	5–7–2	11	6
1–4–1	2–8–1	4–4–1	5–8–1	13	7
1–4–2	2–8–2	4–4–2	5–8–2	15	8
1–5–1	3–1–1	4–5–1	6–1–1	17	9
1–5–2	3–1–2	4–5–2	6–1–2	19	10
1–6–1	3–2–1	4–6–1	6–2–1	21	11
1–6–2	3–2–2	4–6–2	6–2–2	23	12
1–7–1	3–3–1	4–7–1	6–3–1	2	13
1–7–2	3–3–2	4–7–2	6–3–2	4	14
1–8–1	3–4–1	4–8–1	6–4–1	6	15
1–8–2	3–4–2	4–8–2	6–4–2	8	16
2–1–1	3–5–1	5–1–1	6–5–1	10	17
2–1–2	3–5–2	5–1–2	6–5–2	12	18
2–2–1	3–6–1	5–2–1	6–6–1	14	19
2–2–2	3–6–2	5–2–2	6–6–2	16	20
2–3–1	3–7–1	5–3–1	6–7–1	18	21
2–3–2	3–7–2	5–3–2	6–7–2	20	22
2–4–1	3–8–1	5–4–1	6–8–1	22	23
2–4–2	3–8–2	5–4–2	6–8–2	24	24

2, 1, 0 Repeated

In the Telephony tab screen of the *SuperLine* Element Manager, you can select this configuration from the **Derived Lines/Loop** drop-down list box as **2, 1, 0 Repeated**. When this option is selected, two derived lines are placed on QV8 cards in card slots 1, 4, 9, and 12. One derived line is placed on QV8 cards in slots 2, 5, 10, and 13. No derived lines are placed on QV8 cards in slots 3, 6, 11, and 14, but those lines can be used for data traffic and baseband telephony.

The following table lists the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony types in the format card slot number–circuit number–derived line number.

DS1-1	DS1-2	DS1-3	DS1-4	DS0 channels for TR-008 Mode 1	DS0 channels for DDI
1–1–1	4–1–1	9–1–1	12–1–1	1	1
1–1–2	4–1–2	9–1–2	12–1–2	3	2
1–2–1	4–2–1	9–2–1	12–2–1	5	3
1–2–2	4–2–2	9–2–2	12–2–2	7	4
1–3–1	4–3–1	9–3–1	12–3–1	9	5
1–3–2	4–3–2	9–3–2	12–3–2	11	6
1–4–1	4–4–1	9–4–1	12–4–1	13	7
1–4–2	4–4–2	9–4–2	12–4–2	15	8
1–5–1	4–5–1	9–5–1	12–5–1	17	9
1–5–2	4–5–2	9–5–2	12–5–2	19	10
1–6–1	4–6–1	9–6–1	12–6–1	21	11
1–6–2	4–6–2	9–6–2	12–6–2	23	12
1–7–1	4–7–1	9–7–1	12–7–1	2	13
1–7–2	4–7–2	9–7–2	12–7–2	4	14
1–8–1	4–8–1	9–8–1	12–8–1	6	15
1–8–2	4–8–2	9–8–2	12–8–2	8	16
2–1–1	5–1–1	10–1–1	13–1–1	10	17
2–2–1	5–2–1	10–2–1	13–2–1	12	18
2–3–1	5–3–1	10–3–1	13–3–1	14	19
2–4–1	5–4–1	10–4–1	13–4–1	16	20
2–5–1	5–5–1	10–5–1	13–5–1	18	21
2–6–1	5–6–1	10–6–1	13–6–1	20	22
2–7–1	5–7–1	10–7–1	13–7–1	22	23
2–8–1	5–8–1	10–8–1	13–8–1	24	24

1 on Slots 1–6, 2 on 9–11

In the Telephony tab screen of the *SuperLine* Element Manager, you can select this configuration from the **Derived Lines/Loop** drop-down list box as **1 on Slots 1–6, 2 on 9–11**. When this option is selected, one derived line is placed on QV8 cards in card slots 1–6, and two derived lines are placed on QV8 cards in card slots 9–11. QV8 cards in card slots 12–14 have no derived lines but can be used for data traffic and baseband telephony.

The following table lists the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony types in the format card slot number–circuit number–derived line number.

DS1-1	DS1-2	DS1-3	DS1-4	DS0 channels for TR-008 Mode 1	DS0 channels for DDI
1–1–1	4–1–1	9–1–1	10–5–1	1	1
1–2–1	4–2–1	9–1–2	10–5–2	3	2
1–3–1	4–3–1	9–2–1	10–6–1	5	3
1–4–1	4–4–1	9–2–2	10–6–2	7	4
1–5–1	4–5–1	9–3–1	10–7–1	9	5
1–6–1	4–6–1	9–3–2	10–7–2	11	6
1–7–1	4–7–1	9–4–1	10–8–1	13	7
1–8–1	4–8–1	9–4–2	10–8–2	15	8
2–1–1	5–1–1	9–5–1	11–1–1	17	9
2–2–1	5–2–1	9–5–2	11–1–2	19	10
2–3–1	5–3–1	9–6–1	11–2–1	21	11
2–4–1	5–4–1	9–6–2	11–2–2	23	12
2–5–1	5–5–1	9–7–1	11–3–1	2	13
2–6–1	5–6–1	9–7–2	11–3–2	4	14
2–7–1	5–7–1	9–8–1	11–4–1	6	15
2–8–1	5–8–1	9–8–2	11–4–2	8	16
3–1–1	6–1–1	10–1–1	11–5–1	10	17
3–2–1	6–2–1	10–1–2	11–5–2	12	18
3–3–1	6–3–1	10–2–1	11–6–1	14	19
3–4–1	6–4–1	10–2–2	11–6–2	16	20
3–5–1	6–5–1	10–3–1	11–7–1	18	21
3–6–1	6–6–1	10–3–2	11–7–2	20	22
3–7–1	6–7–1	10–4–1	11–8–1	22	23
3–8–1	6–8–1	10–4–2	11–8–2	24	24

1 on all Ports

In the Telephony tab screen of the *SuperLine* Element Manager, you can select this configuration from the **Derived Lines/Loop** drop-down list box as **1 on all Ports**. When this option is selected, one derived line is placed on every port on every QV8 card.

The following table lists the DS0 derived line mapping for both TR-008 Mode 1 and DDI telephony in the format card slot number–circuit number–derived line number.

DS1-1	DS1-2	DS1-3	DS1-4	DS0 channels for TR-008 Mode 1	DS0 channels for DDI
1–1–1	4–1–1	9–1–1	12–1–1	1	1
1–2–1	4–2–1	9–2–1	12–2–1	3	2
1–3–1	4–3–1	9–3–1	12–3–1	5	3
1–4–1	4–4–1	9–4–1	12–4–1	7	4
1–5–1	4–5–1	9–5–1	12–5–1	9	5
1–6–1	4–6–1	9–6–1	12–6–1	11	6
1–7–1	4–7–1	9–7–1	12–7–1	13	7
1–8–1	4–8–1	9–8–1	12–8–1	15	8
2–1–1	5–1–1	10–1–1	13–1–1	17	9
2–2–1	5–2–1	10–2–1	13–2–1	19	10
2–3–1	5–3–1	10–3–1	13–3–1	21	11
2–4–1	5–4–1	10–4–1	13–4–1	23	12
2–5–1	5–5–1	10–5–1	13–5–1	2	13
2–6–1	5–6–1	10–6–1	13–6–1	4	14
2–7–1	5–7–1	10–7–1	13–7–1	6	15
2–8–1	5–8–1	10–8–1	13–8–1	8	16
3–1–1	6–1–1	11–1–1	14–1–1	10	17
3–2–1	6–2–1	11–2–1	14–2–1	12	18
3–3–1	6–3–1	11–3–1	14–3–1	14	19
3–4–1	6–4–1	11–4–1	14–4–1	16	20
3–5–1	6–5–1	11–5–1	14–5–1	18	21
3–6–1	6–6–1	11–6–1	14–6–1	20	22
3–7–1	6–7–1	11–7–1	14–7–1	22	23
3–8–1	6–8–1	11–8–1	14–8–1	24	24

□

Appendix D: Fault clearing

Introduction

This appendix presents step-by-step procedures for clearing faults and resolving problems that may occur while you are installing the AG Communication Systems *SuperLine*™ Access Shelf. For help in clearing faults and resolving problems that arise AFTER the shelf has been installed and has been operating correctly for a period of time, refer to the *SuperLine Access System Troubleshooting* guide. The heading of each subtopic describes the symptom or symptoms of a fault or problem. The text of each subtopic provides a procedure for clearing the fault. The symptom/procedure descriptions are listed in the order in which you might encounter them as you proceed through the shelf installation procedures.

In this appendix

This appendix covers the following fault clearing procedures:

Voltage at power source is out of limits

Use the following procedure to ensure that the proper voltage is present.

Step	Action
1	Disconnect the cable from the power source.
2	Using a multimeter, verify that the cable is not defective (does not have an open lead or a short lead).
3	If the cable is defective, replace it.
4	Check that the voltage at the power source is between –42V and –56V DC.
5	Do one of the following: **IF ...** / **THEN ...** the voltage is within this range — connect the power cable to the power source. the voltage is NOT between –42V and –56V DC — replace the fuse.
6	Has the problem been corrected? **IF ...** / **THEN ...** YES — **STOP**. You have completed this procedure. NO — contact your telephony administrator.

POWR card's Fail LED lighted

The Fail LED on the POWR card remains lighted after the shelf has completely initialized. Use the following procedure to troubleshoot the Fail LED problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Move the rocker switch on the POWR card to the off position.
2	Wait 2 minutes, then turn the rocker switch to the on position.
3	Is the Fail LED still lighted? **IF ...** / **THEN ...** YES — replace the POWR card using the procedure described in the topic **Replacing the POWR card** in the chapter Adding and replacing shelf equipment. NO — **STOP**. You have completed this procedure.

Shelf Power LED is not lighted

The *SuperLine* Access Shelf's power LED is not lighted. Use the following procedure to troubleshoot the Power LED problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Move the rocker switch on the POWR card to the off position.
2	Wait 2 minutes, then turn the rocker switch to the on position.
3	Is the Fail LED still lighted?

IF ...	THEN ...
YES	replace the POWR card using the procedure described in the topic **Replacing the POWR card** in the chapter Adding and replacing shelf equipment.
NO	**STOP**. You have completed this procedure.

Shelf alarm LEDs are not lighted when the VDS1 card is not present

The Major, the Minor, or both shelf alarm LEDs are not lighted when the VDS1 card is not present. Use the following procedure to troubleshoot the alarm LED problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Move the rocker switch on the POWR card to the Off position.
2	Wait 2 minutes, then turn the rocker switch to the On position.
3	Is the Fail LED still lighted? **IF ...** / **THEN ...** YES — replace the POWR card using the procedure described in the topic **Replacing the POWR card** in the chapter Adding and replacing shelf equipment. NO — **STOP**. You have completed this procedure.

POWR card LED not lighted when power switch is on

Use the following procedure to troubleshoot the power problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Move the rocker switch on the POWR card to the off position.
2	Remove both power connectors.
3	Using a multimeter, check that the voltage at both connectors is between –42V and –56V DC.
4	Check the –48V DC fuses at the power source.
5	Are the fuses blown? **IF ...** / **THEN ...** YES / replace the fuses. NO / remove the POWR card and replace it using the procedure described in the topic **Replacing the POWR card** in the chapter Adding and replacing shelf equipment.
6	Connect both power connectors.

FETH card's Fail LED remains lighted

The FETH card's Fail LED remains lighted after initialization. Use the following procedure to correct the FETH Fail LED problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn shelf power off.
2	Remove and replace the FETH card using the procedure described in the topic **Replacing the FETH card** in the chapter Adding and replacing shelf equipment.

VDS1 card's Fail LED remains lighted

The VDS1 card's Fail LED remains lighted after initialization. Use the following procedure to correct the VDS1 Fail LED problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn shelf power off.
2	Remove and replace the VDS1 card using the procedure described in the topic **Replacing the VDS1 card** in the chapter Adding and replacing shelf equipment.

FETH and VDS1 cards' Fail LEDs remains lighted

The FETH and VDS1 cards' Fail LEDs are lighted after initialization. Use the following procedure to correct the FETH and VDS1 Fail LED problems.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn shelf power off.
2	Remove and replace the FETH and VDS1 cards using the procedures described in the topics **Replacing the FETH card** and **Replacing the VDS1 card** in the chapter Adding and replacing shelf equipment.

Element Manager connection not established

Use the following procedure to establish the Element Manager-to-shelf connection.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	At the VDS1 card's Craft 10Base-T port and at the PC or workstation running the Element Manager, remove and re-insert the Ethernet cable.
2	Is the green Link Integrity LED lighted on the VDS1?

IF ...	THEN ...
YES	**STOP**. You have completed this procedure.
NO	contact your network administrator, then replace the Ethernet cable and the VDS1 card. Use the procedures described in the topics **Installing and cabling VDS1 and FETH cards** and **Replacing the VDS1 card**.

VDS1 card's green link integrity LED is not lighted

Use the following procedure to establish the Element Manager-to-shelf connection.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	At the VDS1 card's Craft 10Base-T port, and at the PC running the Element Manager, remove and re-insert the Ethernet cable.
2	Is the green Link Integrity LED lighted on the VDS1?

IF ...	THEN ...
YES	**STOP**. You have completed this procedure.
NO	contact your network administrator, then replace the Ethernet cable and the VDS1 card. Use the procedures described in the topics **Installing and cabling VDS1 and FETH cards** and **Replacing the VDS1 card**.

VDS1 port LED remains lighted red or yellow when DS1 is looped at the DSX

Use the following procedure to correct the problem with the port LED.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Remove and re-insert the RJ-48C connector at the VDS1.
2	Wait 2 minutes to see if the port LED alarm clears.
3	Has the alarm cleared?

IF ...	THEN ...
YES	**STOP**. You have completed this procedure.
NO	do the following: • Remove the RJ-48C connector. • Using a multimeter, check that there is continuity between Pin 1 and Pin 4, and between Pin 2 and Pin 5 on the RJ-48C connector. • Make sure that Pin 1 is not shorted to Pin 5.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Did the multimeter test fail?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>do the following:
check the DSX wiring and make sure that the multimeter test passes.
Make sure that Pin 1 is not shorted to Pin 5.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Re-insert the RJ-48C connector into the VDS1.</td></tr>
<tr><td>6</td><td>Wait 2 minutes to see if the port LED alarm clears.</td></tr>
<tr><td>7</td><td>Has the port LED alarm cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
</table></td></tr>
</table>

Temp alarm icon red

The Temp alarm icon on the Element Manager's Status tab screen is red. Use the following procedure to correct the temperature problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Click the Temp button in the Element Manager Status tab screen or look at the temperature information in the System tab.
2	Is the temperature greater than 68°C/154°F? **IF ...** / **THEN ...** YES / continue to the next step NO / go to step 5.
3	Take any necessary steps to reduce the ambient temperature at the *SuperLine* Access Shelf.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table>
Important: The Element Manager will not clear the Temp alarm until the SuperLine Access Shelf temperature drops below 63°C/145°F.</td></tr>
<tr><td>5</td><td>Turn shelf power off.</td></tr>
<tr><td>6</td><td>Replace the POWR card using the procedure described in the topic Replacing the POWR card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>7</td><td>Turn shelf power back on.</td></tr>
<tr><td>8</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>9</td><td>Replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>10</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>11</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

Battery alarm icon red

The battery alarm icon on the Element Manager's Status tab screen is red. Use the following procedure to correct the battery problem.

Step	Action
1	Check the cabling connection between the battery and the POWR card. Fix any damaged connections or cabling.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

Fuse alarm icon red

The Fuse alarm icon on the Element Manager's Status tab screen is red. Use the following procedure to correct the fuse problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Turn shelf power off.</td></tr>
<tr><td>2</td><td>Remove and replace the POWR card using the procedure described in the topic Replacing the POWR card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>3</td><td>Is the alarm cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>4</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

Misc 1 or Misc 2 icon red

The Misc 1 or Misc 2 alarm icon on the Element Manager's Status tab screen is red. Use the following procedure to clear the miscellaneous alarm.

Important: The Misc 1 and Misc 2 terminals allow telco personnel to connect external devices to the *SuperLine* Access Shelf that trigger an alarm when a problem condition exists. The exact nature of the alarm is determined by the type of monitoring equipment installed.

Step	Action
1	Take appropriate actions to clear the condition that triggered the alarm.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

Pwr Maj icon red

The Pwr Maj icon on the Element Manager's Status tab screen is red. Use the following procedure to clear a Pwr Maj alarm.

The Pwr Maj terminal allows telco personnel to connect external devices to the *SuperLine* Access Shelf that trigger an alarm when a major power problem occurs. The exact nature of the alarm is determined by the type of monitoring equipment installed.

Step	Action
1	Take appropriate actions to clear the condition that triggered the alarm.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

Door alarm icon red

The door alarm will only be reported if the *SuperLine* Access Shelf is enclosed in an optional cabinet. Use the following procedure to clear the door alarm

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Examine the *SuperLine* Access Shelf cabinet.
2	If the door on the *SuperLine* Access Shelf is open, close it.
3	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
4	Open and close the door several times in quick succession. Such action may serve to clear the switch that detects the state of the door.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>5</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>6</td><td>Check the door sensor and replace it if necessary.</td></tr>
<tr><td>7</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>8</td><td>Check the connection between the sensor and the SuperLine Access Shelf. Repair or replace the connection if necessary.</td></tr>
<tr><td>9</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>10</td><td>Turn shelf power off.</td></tr>
<tr><td>11</td><td>Remove and replace the POWR card using the procedure described in the topic Replacing the POWR card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>12</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>13</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

Pwr Min icon red

The Pwr Min icon on the Element Manager's Status tab screen is red. The exact nature of the alarm is determined by the type of monitoring equipment installed.

Important: The Pwr Min terminal allows telco personnel to connect external devices to the *SuperLine* Access Shelf that trigger an alarm when a minor power problem occurs.

Use the following procedure to clear the Pwr MIn alarm.

Step	Action
1	Take appropriate actions to clear the condition that triggered the alarm.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

POWR card icon yellow

The POWR card icon on the Element Manager's Status tab screen is yellow. Use the following procedure to correct the problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn *SuperLine* Access Shelf power off.
2	Remove and replace the POWR card, using the procedure described in the topic **Replacing the POWR card** in the chapter Adding and replacing shelf equipment.
3	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
4	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

VDS1 card icon yellow

The VDS1 card icon on the Element Manager's Status tab screen is yellow. Use the following procedure to correct the problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn the *SuperLine* Access Shelf power off.
2	Remove and reseat the VDS1 card.
3	Restore power to the *SuperLine* Access Shelf.
4	Wait up to 5 minutes for the *SuperLine* Access Shelf to complete its initialization process.
5	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
6	Remove and replace the VDS1 card using the procedure described in the topic **Replacing the VDS1 card** in the chapter Adding and replacing shelf equipment.

FETH card icon yellow

The FETH card icon on the Element Manager's Status tab screen is yellow. Use the following procedure to correct the problem.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Turn the *SuperLine* Access Shelf power off.
2	Remove and reseat the VDS1 and FETH cards. Important: A FETH card problem can sometimes cause problems with a VDS1 card and vice versa. Therefore it is expedient to re-seat both cards whenever a problem with either one is suspected.
3	Restore power to the *SuperLine* Access Shelf.
4	Wait up to 5 minutes for the *SuperLine* Access Shelf to complete its initialization process.
5	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6</td><td>Remove and replace the FETH card using the procedure described in the topic Replacing the FETH card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>7</td><td>Is the alarm condition cleared?<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>8</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>9</td><td>Is the alarm condition cleared?<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>10</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

One or more DS1 L LEDs red

One or more of the DS1 LED icons on the Element Manager's Status tab screen is red. Use the following procedure to clear the DS1 alarm.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Does the SuperLine Element Manager Telephony tab screen as well as event log entries indicate an Incoming LOS?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>go to step 7.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>2</td><td>Does the SuperLine Element Manager Telephony tab screen as well as event log entries indicate Detected AIS?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>continue to the next step.</td></tr>
<tr><td>NO</td><td>go to step 22.</td></tr>
</table></td></tr>
<tr><td>3</td><td>Check the far-end equipment to make sure no devices have failed. If any devices have failed, replace them.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Does the SuperLine Element Manager Telephony tab screen as well as event log entries indicate an Incoming LOF?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>go to step 6.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>go to step 22.</td></tr>
</table></td></tr>
<tr><td>6</td><td>Check the SuperLine Element Manager Telephony tab screen and make sure that the enabled telephony type (TR-008, TR-303 or DDI) is compatible with your central office (CO) switch.</td></tr>
<tr><td>7</td><td>At the DSX panel, loopback the alarmed DS1s towards the SuperLine Access Shelf.</td></tr>
<tr><td>8</td><td>After waiting at least 2 minutes, is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. The problem exists with your switching equipment. Release the DS1 loopback and contact a switch troubleshooting expert or consult the documentation for troubleshooting procedures for your particular type of switch.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>9</td><td>Turn the SuperLine Access Shelf power off.</td></tr>
<tr><td>10</td><td>Remove and reseat the VDS1 and the POWR cards.</td></tr>
<tr><td>11</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>12</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>13</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>14</td><td>Turn shelf power off.</td></tr>
<tr><td>15</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>16</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>17</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>18</td><td>Turn shelf power off.</td></tr>
<tr><td>19</td><td>Remove and replace the POWR card, using the procedure described in the topic Replacing the POWR card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>20</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>21</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>22</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

One or more DS1 R LEDs yellow

One or more of the DS1 R LED icons on the Element Manager's Status tab screen is yellow. Use the following procedure to clear the alarm.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>At the DSX panel, loopback the alarmed DS1s towards the SuperLine Access Shelf.</td></tr>
<tr><td>2</td><td>After waiting at least 2 minutes, is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. The problem exists with your switching equipment. Release the DS1 loopback and contact a switch troubleshooting expert or consult the documentation for troubleshooting procedures for your particular type of switch.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>3</td><td>Turn the SuperLine Access Shelf power off.</td></tr>
<tr><td>4</td><td>Remove and reseat the VDS1 card.</td></tr>
<tr><td>5</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
<tr><td>7</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>8</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>9</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>10</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

Major and minor shelf alarm LEDs lighted simultaneously

The Major and Minor shelf LED icons on the Element Manager's Status tab screen are both lighted. Use the following procedure to clear the shelf alarms.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Condition
1	If you see both the major and minor alarm LEDs lighted simultaneously on the *SuperLine* Access Shelf, make sure that the *SuperLine* Access Shelf has completed initializing. You should wait up to 5 minutes for the *SuperLine* Access Shelf to complete its initialization process.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	Turn the *SuperLine* Access Shelf power off.

<table>
<tr><th>Step</th><th>Condition</th></tr>
<tr><td>4</td><td>Remove and reseat the VDS1 and FETH cards.

Important: A FETH card problem can sometimes cause problems with a VDS1 card and vice versa. Therefore it is expedient to re-seat both cards whenever a problem with either one is suspected.</td></tr>
<tr><td>5</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>6</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
<tr><td>7</td><td>Is the alarm condition cleared?
<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>8</td><td>Remove and replace the VDS1 card, using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>9</td><td>Is the alarm condition cleared?
<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>10</td><td>Remove and replace the FETH card using the procedure described in the topic Replacing the FETH card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>11</td><td>Is the alarm condition cleared?
<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>12</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

EOC-Pri and EOC-Sec icons red

The EOC-Pri and EOC-Sec icons on the Element Manager's Status tab screen are red. Use the following procedure to clear the EOC alarms.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Condition
1	Check the first two DS1s and make sure that they are correctly cabled and that none of the cables are defective. Make any required repairs.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	Consult your switch maintenance personnel to have them troubleshoot any switch problems. For more detailed troubleshooting information, refer to your switch documentation.

<table>
<tr><th>Step</th><th>Condition</th></tr>
<tr><td>4</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>6</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>7</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

TMC-Pri and TMC-Sec icons red

The TMC-Pri and TMC-Sec icons on the Element Manager's Status tab screen are red. Use the following procedure to clear the TMC alarms.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Condition
1	Check the first two DS1s and make sure that they are correctly cabled and that none of the cables are defective. Make any required repairs.
2	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	Consult your switch maintenance personnel to have them troubleshoot any switch problems. For more detailed troubleshooting information, refer to your switch documentation.

<table>
<tr><th>Step</th><th>Condition</th></tr>
<tr><td>4</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>6</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>7</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

EOC-Pri or EOC-Sec icon red

Either the EOC-Pri or EOC-Sec icon on the Element Manager's Status tab screen is red. Use the following procedure to clear the alarm.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Check the *SuperLine* Element Manager Telephony tab screen and make sure that the TR-303 telephony type is compatible with your central office (CO) switch.
2	Verify that the line build out is correct.
3	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
4	At the DSX panel, loopback the alarmed DS1s towards the *SuperLine* Access Shelf.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>5</td><td>After waiting at least 2 minutes, is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. The problem exists with your switching equipment. Release the DS1 loopback and contact a switch troubleshooting expert or consult the documentation for troubleshooting procedures for your particular type of switch.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>6</td><td>Turn the SuperLine Access Shelf power off.</td></tr>
<tr><td>7</td><td>Remove and reseat the VDS1 card.</td></tr>
<tr><td>8</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>9</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
<tr><td>10</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>11</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>12</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>13</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

TMC-Pri or TMC-Sec icon red

Either the TMC-Pri or TMC-Sec icon on the Element Manager's Status tab screen is red. Use the following procedure to clear the alarm.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

Step	Action
1	Check the *SuperLine* Element Manager Telephony tab screen and make sure that the TR-303 telephony type is compatible with your central office (CO) switch.
2	Verify that the line build out is correct.
3	Is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
4	At the DSX panel, loopback the alarmed DS1s towards the *SuperLine* Access Shelf.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>5</td><td>After waiting at least 2 minutes, is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. The problem exists with your switching equipment. Release the DS1 loopback and contact a switch troubleshooting expert or consult the documentation for troubleshooting procedures for your particular type of switch.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>6</td><td>Turn the SuperLine Access Shelf power off.</td></tr>
<tr><td>7</td><td>Remove and reseat the VDS1 card.</td></tr>
<tr><td>8</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>9</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
<tr><td>10</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>11</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>12</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>13</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

All or multiple QV8 icons red

On the Element Manager's Status tab screen, several or all icons for QV8 cards are red. Use the following procedure to clear the alarms.

WARNING
Electric shock and equipment damage hazard

To avoid personal injury or damage to the equipment, before you remove a FETH, VDS1, or POWR card from the SuperLine Access Shelf, ensure that the power switch on the POWR card is in the Off position. Follow all precautions for working with live power, such as using insulating blankets or tools.

CAUTION
Service interruption hazard

VDS1, FETH and POWR cards are NOT hot swappable. Replacing or reseating a VDS1, FETH or POWR card requires you to shut down the SuperLine Access Shelf, which in turn will interrupt service for up to 96 customers.

CAUTION
Service interruption hazard

Reseating or replacing a QV8 card will interrupt service for up to eight customers.

Step	Action
1	Remove and reseat the first errored QV8 card.
2	After a waiting period of at least 2 minutes, are the alarm conditions cleared?

IF ...	THEN ...
YES	**STOP**. You have completed this procedure.
NO	continue to the next step.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Continue reseating any failing QV8 cards one after another. After you reseat each card, wait 2 minutes to see if the alarm condition is cleared. If the alarm condition is not cleared and you have re-seated all the QV8 cards, continue to the next step.</td></tr>
<tr><td>4</td><td>Remove and replace the first QV8 card using the procedure described in the topic Replacing the QV8 card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>5</td><td>After a waiting period of at least 2 minutes, is the alarm condition cleared?<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>6</td><td>Continue replacing the rest of the QV8 cards one after another as described in the chapter Adding and replacing shelf equipment. After you replace each card, wait 2 minutes to see if the alarm condition is cleared. If the alarm condition is not cleared and you have replaced all the QV8 cards, continue to the next step.</td></tr>
<tr><td>7</td><td>Is the alarm condition cleared?<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>8</td><td>Turn the SuperLine Access Shelf power off.</td></tr>
<tr><td>9</td><td>Remove and reseat the VDS1 and the FETH cards.</td></tr>
<tr><td>10</td><td>Restore power to the SuperLine Access Shelf.</td></tr>
<tr><td>11</td><td>Wait up to 5 minutes for the SuperLine Access Shelf to complete its initialization process.</td></tr>
<tr><td>12</td><td>Is the alarm condition cleared?<table><tr><th>IF ...</th><th>THEN ...</th></tr><tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr><tr><td>NO</td><td>continue to the next step.</td></tr></table></td></tr>
<tr><td>13</td><td>Remove and replace the VDS1 card using the procedure described in the topic Replacing the VDS1 card in the chapter Adding and replacing shelf equipment.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>14</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>15</td><td>Remove and replace the FETH card using the procedure described in the topic Replacing the FETH card in the chapter Adding and replacing shelf equipment.</td></tr>
<tr><td>16</td><td>Is the alarm condition cleared?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to the next step.</td></tr>
</table></td></tr>
<tr><td>17</td><td>If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.</td></tr>
</table>

Single QV8 icon red

On the Element Manager's Status tab screen, a single QV8 card's icon is red. Use the following procedure to clear the alarm.

CAUTION
Service interruption hazard

Reseating or replacing a QV8 card will interrupt service for up to eight customers.

Step	Action
1	Remove and reseat the affected QV8 card.
2	After a waiting period of at least 2 minutes, is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
3	Remove and replace the affected QV8 card, using the procedure described in the topic **Replacing a QV8 card** in the chapter Adding and replacing shelf equipment.
4	After a waiting period of at least 2 minutes, is the alarm condition cleared? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / continue to the next step.
5	If none of the previous actions corrects the problem, contact AG Communication Systems customer support by telephone at 1-888-888-AGCS (2427) or at the following e-mail address: superlinehelp@agcs.com.

Derived line status OOS after DN is added successfully

Use the following procedure to determine why the derived line is out of service after the DN is added.

Step	Action
1	Check that the QV8 card is present and the EM telephony configuration is set according to the work order.
2	Is the derived line status still OOS? **IF ...** / **THEN ...** YES — contact your switch administrator. NO — **STOP**. You have completed this procedure.

No dial tone on derived line 1 or 2

No dial tone is present on derived line 1 or 2 after the DNs are added in. Use the following procedure to correct the problem.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Use the Element Manager Status and Adapter tab screens to check that the green rectangular LED for the SuperLine Integrated Access Device under test is lighted, and that the train rate is higher than 320 Kbps.</td></tr>
<tr><td>2</td><td>Is the LED icon NOT green, is the train rate LESS than 320 Kbps, or is the Adapter status disconnected?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>do the following:
Check that the SPFM cables are routed to the SuperLine Access Shelf as described in the the topic Cabling the SPFM to the shelf and make any adjustments as necessary, observing the Caution statement if adjustments are made.
Check for dial tone.</td></tr>
<tr><td>NO</td><td>STOP. You have completed this procedure.</td></tr>
</table></td></tr>
<tr><td>3</td><td>Is the LED icon green and is there a dial tone?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>continue to next step.</td></tr>
</table></td></tr>
<tr><td>4</td><td>Replace the test SuperLine IAD with another one.</td></tr>
<tr><td>5</td><td>Check for dial tone.</td></tr>
<tr><td>6</td><td>Is there a dial tone?
<table>
<tr><th>IF ...</th><th>THEN ...</th></tr>
<tr><td>YES</td><td>STOP. You have completed this procedure.</td></tr>
<tr><td>NO</td><td>Contact your switch administrator.</td></tr>
</table></td></tr>
</table>

FETH card's Link Integrity LED not lighted

The green Link Integrity LED on the 10/100Base-T Port A of the FETH card does not light when an Ethernet crossover cable is inserted into the port.

Step	Action
1	Contact your network administrator to resolve this issue.

No dial tone on CO POTS phone

The CO POTS phone, which is connected to the local digital switch for purposes of verifying the baseband line features, has no dial tone.

Step	Action
1	Contact your switch administrator.

No response from server when pinged from client

Use the following procedure to determine why pinging the TCP/IP address of the server from the client is unsuccessful.

Step	Action
1	Check the *SuperLine* Element Manager Adapter tab screen to see that the Data State is enabled, the Data Ratio Up/Down parameter for the *SuperLine* Integrated Access Device is set, and one of the data telephony types is set.
2	Remove and re-insert the crossover Ethernet cables into the server and client.
3	Ping the TCP/IP address of the server continuously from the client.
4	Is the ping successful? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / contact your network administrator.

No dial tone on baseband line

Use the following procedure to determine why there is no dial tone on the baseband line.

Step	Action
1	Check that the SPFM cables are routed to the *SuperLine* Access Shelf as described in the the topic **Cabling the SPFM to the shelf** and make any adjustments as necessary, observing the Caution statement if adjustments are made.
2	Is there a dial tone on the baseband line? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / contact your switch administrator.

EM free running icon red Use this procedure to clear the free running icon alarm.

Step	Action
1	Use the *SuperLine* Element Manager Telephony tab screen to verify that the EM telephony type is set in accordance to the work order.
2	Is the EM telephony type correct? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / change the telphony type and reset the shelf.
3	Is the free running icon still red? **IF ...** / **THEN ...** YES / contact the switch administrator. NO / **STOP**. You have completed this procedure.

Derived line to derived line call fails when base phone is ringing

Use the following procedure to determine why derived line calls did not complete successfully when a call was made to the baseband voice line.

Step	Action
1	Check the *SuperLine* Element Manager Adapter tab screen to determine if the train rate for the *SuperLine* Integrated Access Device under test is higher than 320 Kbps.
2	Is the train rate higher than 320 Kbps? **IF ...** / **THEN ...** YES / **STOP**. You have completed this procedure. NO / replace the the *SuperLine* IAD with another one.

□

Glossary

4TEL®

Teradyne's computer-controlled diagnostic system for External Facilities.

5ESS®

Lucent Technologies' Class 5 digital central office switch.

10Base-T

An Ethernet Local Area Network (LAN) that operates on shielded twisted-pair (STP) or Category 5 UTP cable. Runs at 10 Mbps.

100Base-T

An Ethernet Local Area Network (LAN) that operates on shielded twisted-pair (STP) or Category 5 UTP cable. Runs at 100 Mbps.

A

AIS

Alarm Indication Signal

AMI

Alternate Mark Inversion. Refers to a specific type of line coding.

ANSI

American National Standards Institute. A standards-setting, nongovernment organization that publishes standards and protocols for voluntary use in the U.S.

ATP

All Tests Passed

B

B8ZS

Bipolar 8-bit Zero Substitution. Refers to a specific type of line coding.

Baseband voice line

A physical line that supports standard telephone service only over the baseband voice/POTS band, plus all standard telephony services.

C

CDF

Combined Distributing Frame

CDFL

Combined Distributing Frame Layout

CD-ROM

Compact Disc-Read Only Memory

Centrex

Business telephone service offered by a local telco from a local CO. Service features include intercom, call forwarding, call transfer, toll restrict, etc.

Circuit pack

A printed circuit board with microprocessors, transistors, and other electronics components that slides into the *SuperLine*™ Access Shelf. Circuit packs include the POWR card, the QV8 card, the FETH card, and the VDS1 card.

CLASS

Custom Local Area Signaling Services. Services include automatic callback, automatic recall, distinctive ringing/call waiting, etc.

CLEI

Common Language Equipment Identification. A number assigned to an individual *SuperLine* Access Shelf device that uniquely identifies it.

CO

Central office

CPEF

Customer Premises Equipment Filter

CPU

Central processing unit

CSC

Customer Support Center at AG Communication Systems

D

dB

Decibel

DCLU

Digital Carrier Line Unit

DCXR

Digital Carrier Span

DDI

Direct Digital Interface

Derived voice line

A standard 64 Kbps μ-law PCM voice offering, supporting normal telephony services such as Caller ID, special ringing, message waiting, V.34 and V.90 modems, and so on. From the end user's perspective, a derived voice line looks and behaves like standard telephony service.

DMS™

Nortel Networks Corporation's Class 5 local digital switch. *DMS* is a trademark of Nortel Networks Corporation.

DN

Directory Number

DPV

Digital Pad Value

DS0

Digital Signal, Level 0. DS0 is equal to one voice conversation digitized under PCM. Twenty-four DS0s (24 x 64 Kbps) equal one DS1.

DS1

Digital Signal, Level 1. DS1 is 1.544 Mbps.

DSP

Digital Signaling Processor

DSX

Digital Signal Cross-Connect; Digital Signal Cross-Connection

DTMF

Dual Tone Multifrequency. A synonym for pushbutton or touchtone telephone dialing.

E

ECD

Engineering Configuration Document

EDT

Extended-Superframe Digital Trunk

EFTB

External Facilities Terminal Block

Element Manager (EM)

A software application for personal computers that enables telco personnel to configure, administer, and monitor *SuperLine* Access Systems.

EN

Equipment Number

EOC

Embedded Operations Channel

EPDG

Equipment Power Distribution and Grounding

ESD

Electrostatic discharge

ESF

Extended Superframe

ESF/NDL

Extended Superframe Format/New Data Link

Ethernet

A network topology that supports high-speed data communication among systems. A widely used standard for LANs.

F

FETH

Fast Ethernet card for the *SuperLine* Access Shelf.

FG

Frame ground

FIU

Facilities Interface Unit

Free run

A condition in which the *SuperLine* Access Shelf's first two DS1s are no longer synchronized with the network clock. This condition causes all shelf DS1s to become disconnected.

G

***GTD-5*® EAX**

GTE's Class 5 local digital switch. *GTD-5* is a registered trademark of GTE Corporation.

GUI

Graphical user interface

H

HID

Hardware ID. An identifier for a *GTD-5* EAX line card.

HTML

Hypertext Markup Language

I

IAD

Integrated Access Device. A voice/data device that makes *SuperLine* service possible at the customer premises.

IDCU

Integrated Digital Carrier Unit

IDLC

Integrated Digital Line Carrier

IDT

Integrated Digital Terminal

IFAC

IDCU Facility

INS

In service

InSv

In service

IOM

Input/Output Maintenance

IROC

Integrated Remote Operations Controller

ISDN

Integrated Services Digital Network

ISP

Internet Service Provider

K

Kbps

Kilobits per second (1,000 bits per second). A data transfer rate.

L

LAN

Local Area Network

LAPD

Link Access Procedure-D

LCC

Line Cable Connector

LDS

Local Digital Switch

LED

Light Emitting Diode

LEN

Line Equipment Number

Line build out

Distance between a *SuperLine* Access Shelf and the local digital switch.

LPG

Line Protection Ground

LTB

Line Terminal Block

M

MAP

Maintenance and Administrative Position. Term used in reference to *DMS* terminal.

MB

Main Battery

Mbps

Megabits per second (1,000,000 bits per second)

MBR

Main Battery Return

MDF

Main Distribution Frame

MDI

Medium Dependent Interface cable

MLT

Mechanized Loop Testing

Multi-Element Manager (Multi-EM)

Software application from AG Communication Systems that provides a graphical user interface for monitoring and administering *SuperLine* Access Shelves and their equipment. Multi-EM is a version of *SuperLine* Element Manager that runs integrated with *OpenView*®Network Node Manager, Hewlett-Packard Company's network management software application.

N

NEBS

Network Equipment Building Standard, Network Equipment Building System

Network Element

A managed object that represents telecommunications equipment within the telecommunications network and performs network element functions; i.e., provide support and/or service to the subscriber

NIC

Network Interface Card

NTB

New Terminal Block

NTR

Network Timing Reference

O

OOS

Out of service

***OpenView* Network Node Manager (NNM)**

Network management software application from Hewlett-Packard Company.

P

PC

Personal computer

PCM

Pulse Code Modulation. A method of encoding an analog voice signal into a digital bit stream.

PIU

Peripheral Interface Unit

POOT

Power Out of Tolerance

POTS

Plain Old Telephone Service

POWR

Power card for the *SuperLine* Access Shelf.

PRI

Primary Rate Interface

Q **QV8**

Quadrature Amplitude Modulation Voice 8 card for the *SuperLine* Access Shelf. Supports up to 8 baseband telephone lines and as many as 16 derived lines.

R **RAI**

Remote Alarm Indication

RC

Recent Change

RDT

Remote Digital Terminal

RLU

Remote Line Unit

RT

Remote Terminal

S **SF**

Superframe

***SLC*®96**

Subscriber Loop Carrier 96. *SLC* is a registered trademark of Lucent Technologies.

SMA2

Subscriber Carrier Module-100 Access

SMS

Subscriber Module *SLC* 96

SNMP

Simple Network Management Protocol

SPFC

SuperLine POTS Filter Card

SRVC

Service Session

STP

Shielded Twisted Pair

***SuperLine* Access Shelf**

A module that houses *SuperLine* QV8, VDS1, FETH, and POWR cards and the SPFM assembly.

SuperLine Access System

AG Communication Systems product that enables a single standard copper, twisted-pair customer telephone connection to support multiple lines carrying voice and data traffic.

SuperLine Element Manager (*SuperLine* EM)

Software application from Lucent Technologies and AG Communication Systems that provides a graphical user interface for monitoring and administering SuperLine Access Shelves and their equipment.

SuperLine Integrated Access Device (IAD)

A voice/data device that makes *SuperLine* service possible at the customer premises.

SuperLine POTS Filter Module (SPFM)

A passive filter splitter; provides the interface between the telco CO switch and the *SuperLine* subscriber lines (baseband voice lines) connected to the *SuperLine* Access Shelf and the External Facilities lines.

SVR

System Version Release

T

T1

A digital transmission link with a capacity of 1.544 Mbps.

TCP/IP

Transmission Control Protocol/Internet Protocol. The dominant protocol suite used on the World Wide Web. TCP allows a process on one machine to send data to a process on another machine using the IP.

Telco

Telephone company

Telco connector

A 25-pair polarized connector that is used to consolidate multiple voice or data lines. Also known as an Amphenol or AMP-CHAMP connector.

TFTP

Trivial File Transfer Protocol

TMC

Timeslot Management Channel

TR-008 Mode 1

Protocol that defines an interface between a CO switch and a remote terminal to handle all call processing and operational functions. Developed by Telcordia Technologies Inc. (formerly Bellcore).

TR-303

Protocol that defines an interface between a CO switch and a remote terminal to handle all call processing and operational functions. Developed by Telcordia Technologies Inc. (formerly Bellcore).

TSI

Timeslot Interchange

U

U

A unit of measurement equal to 1.75 inches, or one mounting space in a telco rack.

UTP

Unshielded Twisted Pair

V

VDS1

Voice DS1 card for the *SuperLine* Access Shelf.

W

WAN

Wide Area Network

□

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