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COMSPHERE

3000 Series Carrier

Installation Manual

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COMSPHERE 3000 Series Carrier

Installation Manual
3000-A2-GA31-80

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Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. This product is intended to be used with a three-wire grounding type plug - a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adaptor.

Prior to installation, use an outlet tester or a voltmeter to check the ac receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

If a three-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.

The dc configuration of this product is to be grounded by connecting an external wire between the building ground and the equipment ground screw on the rear of the power supply assembly. Consult a qualified electrician to ensure that the ground connections are connected.

3. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
5. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
7. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
8. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

Notices

WARNING

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Preface

Objectives and Reader Assumptions

This manual contains installation information for the COMSPHERE® 3000 Series Carrier and is designed to be used with Data Service Units (Models 3511, 3551, 3611, and 3616), dial/lease modems (Models 3811 and 3911), T1 CSUs (Model 3151), and T1 DSU/CSUs (Model 3161).

The appropriate supplements are referred to for specific unit installation and operation information. It is assumed that you are familiar with the functional operation of data equipment, digital network services, Data Service Units (DSUs), and dial/lease modems.

Abstract

Chapter 1 provides descriptive information about the COMSPHERE 3000 Series Carrier, the T1 CSUs, T1 DSU/CSUs, DSUs and dial/lease modems supported, optional equipment, and technical specifications.

Chapter 2 lists the customer's responsibilities and provides guidelines for installing the carrier and its related components.

Chapter 3 provides descriptive information and installation procedures for mounting the carrier in a cabinet, and installing the power supply, the optional fan module, the optional Shared Diagnostic Control Panel (SDCP), the optional speaker panel (for Models 3811 and 3911 dial/lease modems only), the network interface modules, Shared Diagnostic Unit (SDU), and the DSU or dial/lease modem.

The Glossary provides definitions for acronyms and product-specific terms used in this manual.

Related Documents

3000-A2-GB41	<i>COMSPHERE –48 Vdc Central Office Power Unit Installation Guide</i>
3100-A2-GK40	<i>ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide</i>
3150-A2-GB21	<i>ACCULINK 315x Channel Service Unit Operator's Guide</i>
3151-A2-GL11	<i>ACCULINK 3151 Channel Service Unit Reference Card</i>
3160-A2-GB21	<i>ACCULINK 316x Data Service Unit/Channel Service Unit Operator's Guide</i>
3161-A2-GL11	<i>ACCULINK 3161 DSU/CSU Reference Card</i>
3510-A2-GN32	<i>3500 Series Data Service Units, Models 3510 and 3511, User's Guide</i>
3550-A2-GB20	<i>COMSPHERE 3550 Series Data Service Units, Models 3550 and 3551, User's Guide</i>
3610-A2-GB41	<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, Applications Guide</i>
3610-A2-GB46	<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, User's Guide</i>

3610-A2-GB48 *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, User's Guide Supplement*

3610-A2-GN32 *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, Applications Guide*

3610-A2-GB91 *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Operator's Guide*

3615-A2-GB20 *COMSPHERE DualFlow Data Service Units, Models 3615 and 3616, User's Guide*

3810-A2-GB91 *COMSPHERE 3800 Series Modems, Models 3810, 3811, and 3820, User's Guide*

3910-A2-GN32 *COMSPHERE 3900 Series Modems, Models 3910 and 3911, Point-to-Point/Multipoint, Installation and Operation Manual*

Ordering Information

To order AT&T Paradyne documentation, please call 1-800-545-2354, extension 2222.

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Overview

AT&T Paradyne offers the COMSPHERE® 3000 Series Carrier, Figure 1-1, assembly to support high-density mounting of the following AT&T Paradyne products in a central-site environment:

- Model 3151 Channel Service Units (T1 CSUs)
- Model 3161 Data Service Units/Channel Service Units (T1 DSU/CSUs)
- Models 3511, 3551, 3611, and 3616 Data Service Units (DSUs)
- Models 3811 and 3911 dial/lease modems

Features

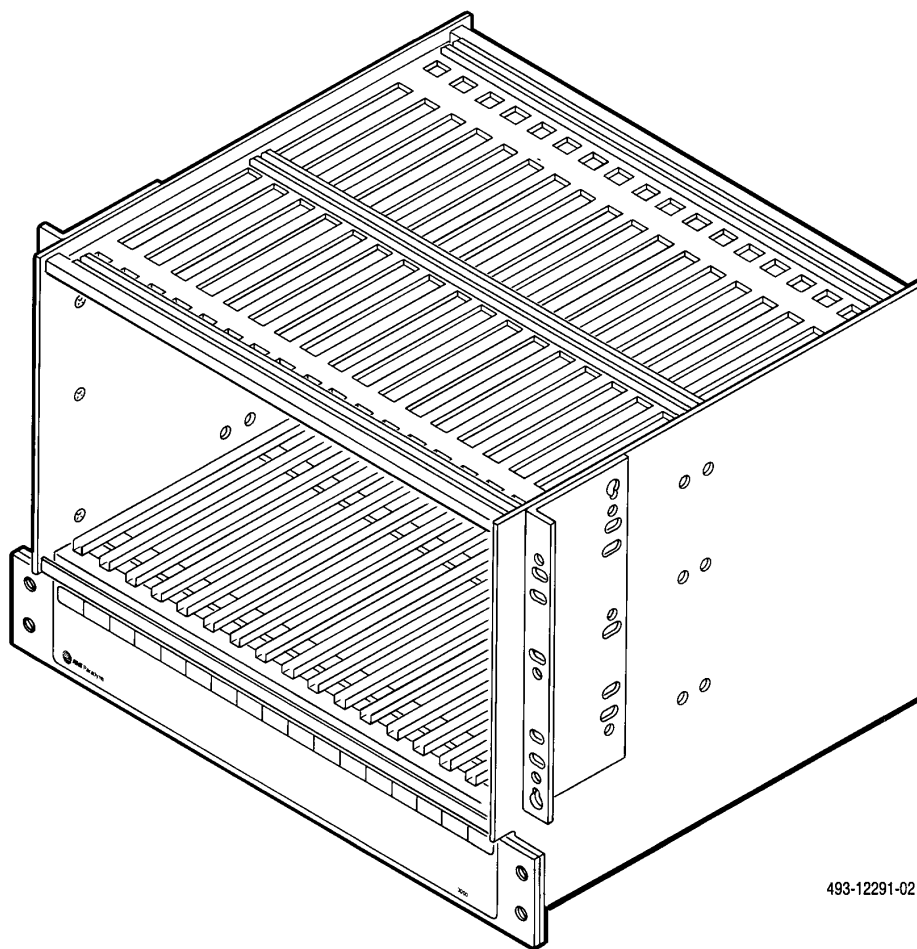
The carrier provides a convenient assembly in which you can install a combination of up to 16 T1 CSUs, T1 DSU/CSUs, DSUs, and/or dial/lease modems in a space-efficient package for crowded computer/communications room environments.

In addition to the 16 devices, a single carrier operates with a power transformer unit, an optional fan module, an optional Shared Diagnostic Control Panel (SDCP), and an optional speaker panel (for use with Models 3811 and 3911 dial/lease modems only).

The number of devices that can be installed in a carrier is reduced by one for each Time Division Multiplexer (TDM) or Multichannel Multipoint (MCMP) circuit card that is installed. A TDM or MCMP card (functioning as a multiplexer or digital bridge) is physically attached to a Model 3611 DSU and occupies a separate slot in the carrier. For digital bridge applications, each DBM-V, DBM-S, or DBM-D occupies a separate slot, as well.

The ac power distribution systems for the carrier consist of a power transformer unit that contains two transformers, each serving eight slots in the carrier. The backplane distributes low-voltage ac power from the transformers to each slot, and an individual power supply on each DSU or dial/lease modem produces the regulated dc voltage.

A carrier designed to operate from a –48 Vdc power unit is also available. This unit, called the Central Office (CO) Power Unit, consists of a single dc power module with a fan and operates in Basic mode (the mode of operation in which the single power module supplies power to the entire carrier). An optional second power module is available for the CO Power Unit. With the optional second power module, the CO Power Unit can be configured to operate in either the Redundant mode (the mode of operation in which both power modules serve all the slots in the carrier and if one power module fails, the remaining power module assumes the entire load) or the Independent mode (the mode of operation in which each power module serves only eight consecutive slots – Slots 1 through 8 or Slots 9 through 16 in the carrier). The Shared Diagnostic Unit (SDU), which is contained in Slot 0, is powered by both power modules. For more information, see the *COMSPHERE –48 Vdc Central Office Power Unit Installation Guide*.



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Figure 1-1. COMSPHERE 3000 Series Carrier

An optional fan module for the ac carriers is available to provide forced air cooling to dissipate heat generated within the carrier. It is recommended that fully configured carriers and cabinets be installed with fan modules to extend the life of the equipment. Guidelines for fan module provisions are listed in Table 3-1 of the *Fan Module Installation* section in Chapter 3.

An SDCP is required for initial installation and for testing of 3600 Series DSUs, 3151 T1 CSUs, and 3161 T1 DSU/CSUs and their options. Models 3811 and 3911 dial/lease modems can be installed using the SDCP or AT commands from the attached DTE. The SDCP, in conjunction with the SDU, allows up to eight COMSPHERE 3000 Series Carriers to be managed from one control panel. Models 3551, 3611, and 3616 DSUs and Models 3811 and 3911 dial/lease modems are managed by either the COMSPHERE 6700 or 6800 Series Network Management System (NMS).

Within the carrier, the first slot (Slot 0) is reserved for the SDU. The SDU provides the required interface that daisy chains carriers together for NMS and/or SDCP control. In a cabinet configuration, connectivity between the DSUs in the individual carriers allows control of compatible units in the cabinet through a single NMS interface, a single SDCP, or both.

On the rear of the carrier is a pair of 50-pin connectors (P21 and P22) that provide the following network interfaces:

- Digital line interface for DSUs.
- Analog leased-line interface for dial/lease modems.

Network Interface Modules (NIMs) can be installed at the rear of the carrier (when not occupied by an Auxiliary Backplane) to provide the PSTN (dial) or switched 56 kbps digital service interface for both DSUs and dial/lease modems. There are nine different NIMs. For a list of the feature/part numbers of these NIMs, see Appendix B of this manual.

Alternatively, you can install up to two Auxiliary Backplanes at the rear of the carrier to allow Model 3151 T1 CSUs and Model 3161 T1 DSU/CSUs to provide an interface between a T1 digital network and Customer Premise Equipment (CPE).

A modular DSU or dial/lease modem is a circuit card that contains “gold finger” contacts on the rear edge of the card and is supplied with a rear connector plate. A rear connector plate has two DTE connectors, a 25-pin EIA-232 connector and a 25-pin CCITT V.35 connector. It allows removal of a modular circuit card without disconnecting the DTE cables at the rear of the carrier. Also, there are connector modules which have six ports and are supplied with the modular DSU-TDM or

DSU-MCMP circuit cards. These connector plates and modules function as interfaces between the modular circuit cards and the DTEs.

This manual describes the procedure for installing a COMSPHERE 3000 Series Carrier into a COMSPHERE 72-inch cabinet. A COMSPHERE 72-inch cabinet with available equipment-mounting dimensions of 63 inches high by 19 inches wide has the capacity to hold up to six carriers, allowing for a high-density installation combination of up to 96 DSUs and/or dial/lease modems. COMSPHERE 3000 Series Carriers can also be mounted in other types of EIA standard 19- or 23-inch wide cabinets. (The heights of the other types of cabinets may vary.)

Technical Specifications

Table 1-1 lists the Technical specifications for the COMSPHERE 3000 Series Carrier.

Table 1-1
(1 of 6)
Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
ENVIRONMENT Operating Temperature Relative Humidity Storage Temperature Shock and Vibration	32°F (0°C) to 122°F (50°C) 5% to 95% (noncondensing) –4°F (–20°C) to 158°F (70°C) Withstands normal shipping and handling
POWER REQUIREMENTS Carrier with ac power supply (maximum capacity) 100 Vac (approved for use with Models 3811 and 3911) 115 Vac (approved for use with Models 3151, 3161, 3511, 3551, 3611, 3616, 3811, and 3911) 230 Vac (approved for use with Models 3811 and 3911) Fan Module 100 Vac 115 Vac 230 Vac Shared Diagnostic Control Panel (SDCP) 100 Vac 115 Vac 230 Vac	85—100 Vac, 47-63 Hz (3.0 amp, 175 watts at 100 Vac) 90—132 Vac, 60 Hz ±3 (3.0 amp, 216 watts at 115 Vac) 220—240 Vac nominal, 47 to 63 Hz (1.5 amp, 175 watts at 230 Vac) Supplied by carrier, 45 watts at 100 Vac Supplied by carrier, 45 watts at 115 Vac Supplied by carrier, 57 watts at 230 Vac Supplied by carrier, 1 watt at 100 Vac Supplied by carrier, 1 watt at 115 Vac Supplied by carrier, 1 watt at 230 Vac

Table 1-1
(2 of 6)

Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
POWER REQUIREMENTS (Cont'd) Shared Diagnostic Unit (SDU) Model 3151 Model 3161 Model 3511 Models 3551 and 3611 DBM-V, DBM-S, or DBM-D Models 3551, 3611, and 3616 with DBM Model 3611 with TDM Model 3611 with DBM and TDM Model 3611 with MCMP Model 3611 with DBM and MCMP Model 3811 modem Model 3911 modem Carrier with sixteen 3551, 3611, and 3616 DSUs with DBMs plus SDU and fan module Carrier with sixteen 3151 CSUs plus SDU, SDCP, and fan module Carrier with sixteen 3161 DSU/CSUs plus SDU, SDCP, and fan module	24 Vac (CT), 60 Hz ± 3 (0.01 amp, 1.5 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (3.7 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (9.3 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.07 amp, 6 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.03 amp, 4.5 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.05 amp, 8.0 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.05 amp, 8.0 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.07 amp, 8.6 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.09 amp, 12.15 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.08 amp, 9.1 watts at 115 Vac) 24 Vac (CT), 60 Hz ± 3 (0.10 amp, 12.65 watts at 115 Vac) 24 Vac (CT), 47—63 Hz (0.05 amp, 3.4 watts at 100 Vac) 24 Vac (CT), 60 Hz ± 3 (0.04 amp, 3.4 watts at 115 Vac) 24 Vac (CT), 47—63 Hz (0.02 amp, 3.4 watts at 230 Vac) 24 Vac (CT), 47—63 Hz (0.07 amp, 4.0 watts at 100 Vac) 24 Vac (CT), 60 Hz ± 3 (0.06 amp, 4.0 watts at 115 Vac) 24 Vac (CT), 47—63 Hz (0.03 amp, 4.0 watts at 230 Vac) 90—132 Vac, 60 Hz ± 3 (1.65 amp, 165 watts at 115 Vac) 90—132 Vac, 60 Hz ± 3 (1.25 amp, 111 watts at 115 Vac) 90—132 Vac, 60 Hz ± 3 (2.4 amp, 215 watts at 115 Vac)
FAN MODULE POWER DISSIPATION 100 Vac 115 Vac 230 Vac	154 Btu/hr 154 Btu/hr 195 Btu/hr

Table 1-1
(3 of 6)
Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
HEAT DISSIPATION (MAX.) Shared Diagnostic Unit (SDU) Model 3151 T1 CSU Model 3161 T1 DSU/CSU Model 3511 DSU Models 3551 and 3611 DSUs DBM-V, DBM-S, or DBM-D Models 3551, 3611, and 3616 with DBM Model 3611 with TDM Model 3611 with MCMP Model 3811 modem Model 3911 modem	5.2 Btu/hr 12.6 Btu/hr (3.7 watts) 31.7 Btu/hr (99.3 watts) 20.5 Btu/hr 22.2 Btu/hr 29.0 Btu/hr 29.0 Btu/hr 33.4 Btu/hr 33.4 Btu/hr 11.7 Btu/hr 13.7 Btu/hr
PHYSICAL DIMENSIONS Carrier Height Width Depth Power Transformer Unit Height Width Depth Fan Module Height Width Depth Shared Diagnostic Control Panel (SDCP) or Speaker Panel Height Width (length) Depth Shared Diagnostic Unit (SDU) Height Width Depth Models 3511, 3551, 3611, 3616, 3811, and 3911 Height Width (thickness) Depth	10.5 inches (26.7 cm) 19.0 inches (48.3 cm) 14.0 inches (35.6 cm) 2.5 inches (6.4 cm) 16.9 inches (42.9 cm) 6.5 inches (16.5 cm) 1.8 inches (4.4 cm) 19.0 inches (48.3 cm) 5.0 inches (12.7 cm) 2.6 inches (6.5 cm) 19.0 inches (48.3 cm) 0.8 inches (1.1 cm) 7.1 inches (18.1 cm) 1.0 inches (2.5 cm) 12.9 inches (32.8 cm) 7.1 inches (18.1 cm) 1.0 inches (2.5 cm) 13.4 inches (34.0 cm)

Table 1-1
(4 of 6)

Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
PHYSICAL DIMENSIONS (Cont'd) Model 3611 with TDM or MCMP Height Width (widest-point faceplates) Depth Models 3151 and 3161 Height Width Depth Rear Connector Plate (2-port) Height Width Depth (25-pin V.35 Interface) Connector Module (6-port) Height Width Depth Auxiliary Backplane Height Width Depth	7.1 inches (18.1 cm) 2.0 inches (5.0 cm) 13.4 inches (34.0 cm) 7.1 inches (18.0 cm) 1.0 inches (2.5 cm) 14.2 inches (36.1 cm) 5.2 inches (13.2 cm) 0.9 inches (2.3 cm) 1.0 inches (2.5 cm) 6.9 inches (17.5 cm) 1.8 inches (4.6 cm) 3.3 inches (8.4 cm) 9.0 inches (22.9 cm) 8.0 inches (20.3 cm) 1.3 inches (3.3 cm)
WEIGHT Carrier (empty) Power Transformer Unit 100 Vac 115 Vac 230 Vac Fan Module 100 Vac 115 Vac 230 Vac Shared Diagnostic Control Panel (SDCP) Rear Connector Plate (2-port) 25-pin EIA-232/25-pin V.35 Connector Module (6-port) Speaker Panel Shared Diagnostic Unit (SDU) Network Interface Module (NIM) Model 3151 Model 3161 Auxiliary Backplane	17.0 pounds (7.7 kg) 14.6 pounds (6.6 kg) 19.0 pounds (8.6 kg) 14.1 pounds (6.4 kg) 6.7 pounds (3.0 kg) 8.0 pounds (3.6 kg) 7.5 pounds (3.4 kg) 1.6 pounds (0.7 kg) 0.1 pounds (0.06 kg) 1.0 pound (0.5 kg) 1.3 pounds (0.6 kg) 1.0 pounds (0.5 kg) 0.2 pounds (0.1 kg) 1.3 pounds (0.6 kg) 1.8 pounds (0.82 kg) 2.4 pounds (1.1 kg)

Table 1-1
(5 of 6)
Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
NETWORK INTERFACE Digital/Lease Network Interface Network Interface Module: Dial 4-wire Switched 56 (U.S. only) 2-wire Switched 56 Model 3151 and 3161 Physical Interface USA Canada	Full Compliance with AT&T Technical Reference 62310–1987, “Digital Data System Channel Interface Specification,” November 1987; and Bell Canada “Digital Circuit Terminating Equipment (DCTE) Specifications,” July 1989, Issue 1 (2) 50-pin connector Digital: USOC RJ48T Lease: 50-pin to 8-pin cable; JM8 (1 or 2) 50-pin connector Permissive: USOC RJ21X Programmable: USOC RJ27X (1 or 2) 50-pin connector; USOC SJA57 (1 or 2) 50-pin connector (1 or 2) 50-pin connector; RJ48H (T1) CA81A (T1 with adapter cable)
DTE INTERFACE Model 3151 Physical Interface Framing Format Coding Format DTE Line Equalization Send AIS Model 3161 (DSX-1) Physical Interface Framing Format Coding Format DTE Line Equalization Send AIS	DB15S D4, ESF AMI, B8ZS 5 selectable ranges from 0 to 655 feet (0 to 196.5 meters) Selectable DB15S D4, ESF AMI, B8ZS 5 selectable ranges from 0 to 655 feet (0 to 196.5 meters) Selectable
MODEL 3161 PORT INTERFACE Standards Rates	EIA 530A, V.35, RS-449, V.11 Nx64 – 64-1.536 Mb Nx56 – 56-1.344 Mb

Table 1-1
(6 of 6)

Technical Specifications for the COMSPHERE 3000 Series Carrier

Technical Specifications	Criteria
MODEL 3161 CLOCKING SOURCES	T1 network interface, DSX-1 T1 interface, Port 1, internal clock, external clock
APPROVALS Underwriters Laboratories, Inc. (UL) Recognized Component Canadian Standards Association Certified Component	UL Standard for Safety, UL 1950 CSA Standard C22.2 No. 950-M89

Equipment Warranty and Support

AT&T Paradyne's Customer Assistance Center is available 24 hours a day to help you place an installation request, report a hardware or software problem, or place a trouble report. The center provides technical support and remotely diagnoses equipment problems Monday through Friday, between the hours of 8 a.m. and 8 p.m. EST, excluding holidays. You can also call the center if you participate in the on-site support program (refer to the *Enhanced Support Services* section) or if you would like to request support on a time and materials basis.

Call the following toll-free number to reach the Customer Assistance Center:

1-800-237-0016

NOTE

Effective January 1, 1995, the Customer Assistance Center is available to provide technical support 24 hours a day, 365 days a year.

Equipment Service

To obtain service under your warranty, call the Customer Assistance Center at the number listed above. Please have the following information available before you call:

Company Name and Address
Contact Name and Telephone Number
Shipping Address, if different from the company address
Billing Address, if different than the shipping address
Model Number and Serial Number of the unit
A brief description of the problem

The Customer Assistance Center will verify that the equipment is in need of repair. You are provided a Return Materials Authorization (RMA) number to help expedite the repair request. Once you receive an RMA number, pack the unit securely and ship the package *insured and postage prepaid* to:

AT&T Paradyne Corporation
Customer Support
Attn: Repair Center
8550 Ulmerton Road, Building B
Largo, Florida 34641

Make sure the RMA number is in a visible location on the outside of the package.

Out of Warranty

If your equipment is out of warranty and you do not have a maintenance support agreement, factory repair support is available.

To send equipment to AT&T Paradyne's Repair Center, call the following toll-free number Monday through Friday, between the hours of 8 a.m. and 5 p.m. EST, excluding holidays:

1-800-772-7691

Please have your purchase order number and the information listed in the *Equipment Service* section ready when you call for your RMA number. Package and ship the equipment to the Repair Center as described, making sure the RMA number is clearly visible on the outside of the package.

Enhanced Support Services

In addition to the customer support described, AT&T Paradyne offers a wide variety of enhanced customer support programs that are designed to meet our customers needs. Our high quality support programs range from equipment installation to premium on-site support, as well as network management.

For more information about our enhanced support services, contact your AT&T Paradyne representative, or call the following toll-free number, 8 a.m. to 5 p.m. EST, excluding holidays:

1-800-482-3333

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Installation Planning 2

Overview	2-1
Customer Responsibilities	2-2
Installation Considerations	2-2

Overview

Before installing your COMSPHERE 3000 Series Carrier into a COMSPHERE cabinet (or equivalent), verify that you have everything you need to complete the installation, and that you have ordered the appropriate components.

The following steps are required for planning the installation of the carrier:

- Preparing the site.
- Determining the necessary components for your carrier.
- Securing ac power with proper grounding for your new equipment.

The following steps are required for the installation of the carrier and related components:

- Setting up the carrier cabinet.
- Installing the carrier(s) and removing the cover plate.
- Installing the Shared Diagnostic Control Panel ribbon cable if a Shared Diagnostic Control Panel (SDCP) is to be installed.
- Installing the power transformer unit.

- Installing the fan module, if applicable.
- Mounting the SDCP, if applicable, or replacing the cover plate.
- Mounting the speaker panel for Models 3811 and 3911 dial/lease modems, if applicable, between multiple carriers.
- Inter-connecting the Shared Diagnostic Unit (SDU) between carriers, if applicable.
- Connecting the SDU to an NMS, if applicable, between multiple carriers.
- Connecting the network cables.
- Installing a frame ground/signal ground strap.
- Connecting the carrier to an alarm output, if required.
- Supplying ac power to the carrier.
- Installing the rear connector plates and/or connector modules for modular devices, if applicable.
- Installing the Network Interface Modules (NIMs).
- Installing the 3151/3161 Auxiliary Backplanes, if needed.
- Installing the devices and/or filler panels. (Filler panels are required for unfilled slots in the carrier.)

Customer Responsibilities

Preparing the installation site, including securing ac power with proper grounding, and verifying that you have the appropriate components for your site requirements are your responsibility. You can call your AT&T Paradyne representative, however, if you need assistance or have any questions.

When you order your COMSPHERE 3000 Series Carrier, certain components are supplied with your carrier; other components must be ordered separately.

Supplied with the carrier:

- 3000 Series Carrier assembly
- Fuses
- Cable ties
- Signal ground/frame ground strap

You are responsible for ordering/supplying the following equipment:

- COMSPHERE 72-inch cabinet, or other non-AT&T Paradyne EIA standard 19- or 23-inch wide cabinet.
- Power transformer unit.
- Fan module(s), if needed.
- SDCP.
- Speaker panel (for use with the Models 3811 and 3911 modems), if needed.
- One digital or leased network interface cable for each of the eight DSUs or modems.
- TDM (and MCMP) and/or digital bridge interface cables, if needed.
- One or two Network Interface Modules (NIMs), if needed.
- One or two dial network interface cables, if needed.
- Connecting cables and cords. (For a complete list of the available cables and cords, see Appendix B of this manual.)
- Rear connector plates for optional pre-mounting. (Modular devices are packaged with rear connector plates, but you can also order rear connector plates separately.)

- Shared Diagnostic Unit (SDU), if needed.
- 3151/3161 Auxiliary Backplanes, if needed.
- T1 CSUs, T1 DSU/CSUs, DSUs, DBM-Vs, DBM-Ss, DBM-Ds, and/or dial/lease modems, and options needed (DBMs, TDMs, MCMPs).
- Filler panels for empty slots.
- Applicable manuals

An equipment list is included at the end of this manual to assist you in ordering any additional components you may require.

Installation Considerations

Your installation site should be well-ventilated, clean, and free of environmental extremes. There should be 2 to 3 feet of clearance at the front and rear of the cabinet in which the carrier is to be installed to allow access for installation of the power transformer unit, (optional) fan module, and (optional) SDCP, as well as the network interface connectors, rear connector plates, and DTE cables.

HANDLING PRECAUTIONS FOR STATIC SENSITIVE DEVICES

AT&T Paradyne products are designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact the nearest AT&T Paradyne Customer Support office.

One COMSPHERE 72-inch cabinet can accommodate up to six COMSPHERE 3000 Series Carriers. A cabinet does not need to be fully populated with carriers, however. There are several general rules to follow during installation of the carrier.

1. If installing multiple carriers, install the lower one first, and if installing a full cabinet of carriers, install the carriers from the bottom of the cabinet and work up. This provides the following:
 - a. Proper alignment for subsequent carriers.
 - b. Easier carrier installation since they can be placed in the mounting and lowered onto the mounting screws.
 - c. Easier connection of the DTE interface.
 - d. Proper cabinet balance. Bottom-up installation keeps the cabinet from becoming top heavy.
2. You must mount carriers when they are empty.

If a carrier is installed in an EIA standard 23-inch (wide) cabinet, however, the mounting brackets on the carrier must be reversed before the carrier is mounted. Carriers can be installed in either EIA standard 19- or 23-inch (wide) cabinets.

Models 3551, 3611, and 3616 DSUs and Models 3811 and 3911 dial/ lease modems within the COMSPHERE 3000 Series Carrier(s) can be managed from an SDCP, a Network Management System (NMS), or both. Remember that the Models 3551, 3611, and 3616 DSUs and Models 3811 and 3911 dial/lease modems are managed by the 6700 or 6800 Series NMS. A COMSPHERE 3000 Series Carrier cannot be connected to both a 6700 Series NMS and a 6800 Series NMS at the same time.

The location of the SDCP within the cabinet should be determined ahead of time. It should be installed at a convenient level, usually at eye-level. In a fully configured cabinet, this would be the fourth or fifth carrier from the bottom. Note that the Model 3511 DSUs are not capable of being managed by an SDCP.

The alarm output connection is closed, activating the customer-supplied alarm, when any DSU or Model 3811 or 3911 dial/lease modem in the carrier has an alarm condition that lights the red Alrm LED of the DSU or modem. For information on how to connect the alarm output, see the *Alarm Output Connection* section in Chapter 3.

Up to eight carriers can be controlled by an SDCP, but there must be a Shared Diagnostic Unit (SDU) installed in each carrier. (Slot 0 in each carrier is reserved for the SDU.) The SDU provides the interface that connects the SDCP to other carriers. Cabling is required that daisy chains these interfaces together.

If the units in the carriers are to be managed from an NMS, an SDU is required in all carriers. Up to eight carriers can be daisy chained together.

Cooling requirements should be given consideration. Depending upon the number of units in the carrier and how they are equipped, a fan module may be recommended. Table 3-1 in Chapter 3 will help you determine whether or not you need additional cooling for your carrier.

Two 50-pin connectors (P21 and P22) at the rear of the carrier, each serving eight slots, provide the digital interface for DSUs and the analog leased-line interface for dial/lease modems. DSUs and dial/lease modems can be placed in the same carrier, but they should be grouped together, (e.g., eight DSUs with a digital interface and eight dial/lease modems with an analog leased-line interface).

If modular devices are installed in the same carrier as non-modular devices, the modular devices must be installed to the left of all other devices, as viewed from the front of the carrier.

If your carriers are equipped with DSUs with DBMs, dial/lease modems, or modems having dial backup capability, the half of the carrier containing those devices must have a Network Interface Module (NIM) installed to provide a dial network or switched 56 kbps digital service interface. Since one module serves eight slots, it is best to group units with dial capability.

NIMs can be installed at the rear of the carrier. There is a total of nine different NIMs available.

The carrier's backplane contains connectors which automatically engage mating connectors on DSUs (and TDM or MCMP circuit cards, if installed) or dial/lease modems when they are installed. To prevent accidental contact with these connectors, use filler panels for unfilled slots. Verify that you have ordered a sufficient quantity.

To use 3151 CSUs or 3161 DSU/CSUs in the carrier, you must remove any rear connector plates or modules and add the 3151/3161 Auxiliary Backplane. Using a single Auxiliary Backplane, you can install any combination of up to eight 3151 CSUs and 3161 DSU/CSUs on one side of the 3000 Series Carrier, and up to eight 3600, 3800, and 3900 Series devices on the other side of the carrier. Alternatively, using two Auxiliary Backplanes, you can install up to sixteen 3151 CSUs or 3161 DSU/CSUs in a single 3000 Series Carrier.

For each non-modular TDM or MCMP circuit card installed in the carrier, determine whether the circuit card is to be used as a Time Division Multiplexer (TDM) or as a digital bridge. A TDM interface cable is supplied with each non-modular TDM or MCMP circuit card. However, a digital bridge interface cable must be ordered separately.

For modular TDM or MCMP circuit cards, use standard cables for Ports 1 through 6. However, a 6-port V.35 interconnect cable is required for the 26-pin high-density D-type connector on the connector module. This cable must be ordered separately.

It is recommended that you do not perform any procedure that removes power to the carrier (for example, replacing the power transformer unit or disconnecting power to the power transformer to install an SDCP in a fully configured carrier) during peak operating hours since disconnecting power disables all units in the carrier.

Installation 3

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Overview

A COMSPHERE 72-inch cabinet is available for mounting the COMSPHERE 3000 Series Carriers. Up to six carriers can be mounted into a single cabinet. The COMSPHERE 3000 Series Carriers can also be mounted into other commercial EIA standard 19-inch and 23-inch cabinets.

The COMSPHERE 3000 Series Carrier, Figure 3-1, is designed to house T1 CSUs, T1 DSU/CSUs, DSUs, DBM-Vs, DBM-Ss, DBM-Ds, TDMs, MCMPs, and dial/lease modems. The carrier is a metal enclosure that contains slots for installation of 17 circuit cards. The slot labeled SDU (Slot 0) is reserved for the Shared Diagnostic Unit (SDU); Slots 1 through 16 are for T1 CSUs, T1 DSU/CSUs, DSUs, DBM-Vs, DBM-Ss, DBM-Ds, TDMs,

MCMPs, or dial/lease modems. Under each slot number (on the cover plate or SDCP) is a small area in which to write the circuit channel identification numbers.

The carrier's backplane contains connectors which automatically engage mating connectors on the devices as they are being installed. Filler panels (which must be ordered separately) are required for unfilled slots.

Two 50-pin connectors (P21 and P22) at the rear of the carrier (each serving eight carrier slots) provide an interface between the carrier and the digital line for DSUs and the carrier and the leased line for dial/lease modems. Above these are connectors for the dial network connections (P23 and P26). One or two network interface modules (each serving eight carrier slots) can be ordered, as needed, to establish dial network connections.

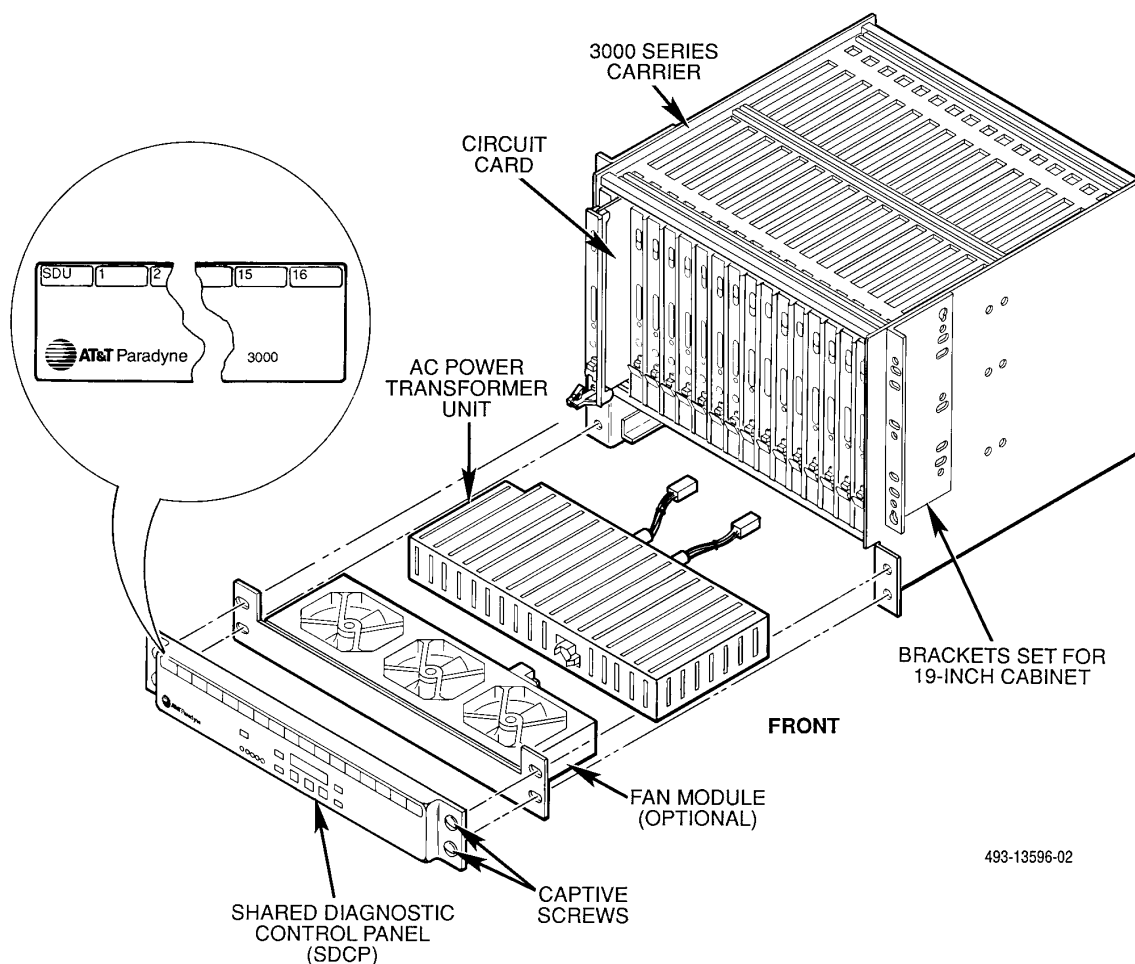


Figure 3-1. COMSPHERE 3000 Series Carrier Assembly

There are nine NIMs available. The following NIMs are used with the 3600 Series DSUs/DBMs:

- Permissive NIM (for use with V.32 and 2-wire Switched 56 DBMs)
- Programmable NIM (for use with V.32 DBMs)
- 4-wire Switched 56 NIM (for use with 4-wire Switched 56 DBMs)

WARNING

Do not connect a 2-wire switched 56 kbps plug into an RJ11C jack. This type of jack is intended for analog PSTN devices. Failure to do this may cause equipment damage and harm to the telephone network.

The following NIMs are used with the dial/lease modems, or a combination of DSUs with V.32 DBMs and dial/lease modems in the same carrier half:

- Permissive NIM (3911 only)
- Permissive NIM with the Make Busy feature
- Programmable NIM with the Make Busy feature (3811 only)
- Permissive NIM with the Service Line feature
- Programmable NIM with the Service Line feature (3811 only)
- Permissive NIM with both the Make Busy and Service Line features
- Programmable NIM with both the Make Busy and Service Line features (3811 only)

NOTE

You cannot use a NIM on the side of the carrier where an Auxiliary Backplane is installed.

Programmable mode corrects any loss in the transmit signal level between the modem and the central office by permitting the modem to transmit at the optimum signal level. This is accomplished by the local telephone company installing a resistor into the network interface and is usually identified by an RJ45S-type jack.

Permissive mode is a standard dial-line connection and is identified by the use of an RJ11C- or SJA48-type jack. (The carrier also supports RJ21X- and RJ27X-type mass termination interfaces for Permissive and Programmable modes, respectively.)

The DDD NIMs, programmable and permissive, may have Make Busy and Service Line as additional capabilities. The *Make Busy feature* is useful when modems are used in a “hunt” or “rotary” group. This feature ties the Tip and Ring signals together so that the modem appears busy. Make Busy is not used by DSUs with DBMs, but using a NIM with this feature will not affect the DBM’s performance. The *Service Line feature* permits an extra dial line to be connected to a COMSPHERE 3000 Series Carrier. NIMs with this feature are identified by the two modular connectors mounted on the NIM.

WARNING

The Make Busy feature must only be used behind a PBX. Connecting a NIM with the Make Busy capability directly to the PSTN is a violation of FCC Part 68 Rules and Canadian DOC CS-03 Regulations.

Non-modular DSUs equipped with TDM or MCMP circuit cards are supplied with time division multiplexer interface cables. If you plan to use the digital bridge function, you must order a digital bridge interface cable.

When modular DSUs or modems are to be installed in the carrier, rear connector plates or connector modules must be installed at the rear of the carrier. Modular DSUs and dial/lease modems are circuit cards that can be removed from the front of the carrier without disturbing the DTE cables attached to the rear connector plate at the rear of the carrier. Also, there are connector modules that are supplied with the modular DSU-TDM (or DSU-MCMP) circuit cards. These connector plates and modules function as interfaces between the modular circuit cards and the DTEs.

A power transformer unit provides low voltage ac power to the carrier’s internal power distribution bus. A carrier designed to operate from a –48 Vdc power unit is also available. This power unit is called the Central Office (CO) Power Unit and it consists of one dc power module. Note that an optional second power module is available. For more information on the CO Power Unit, see the *COMSPHERE –48 Vdc Central Office Power Unit, Installation Guide*.

Optional fan modules provide cooling to the devices in the cabinets for operation at high ambient temperatures.

An optional speaker panel provides audio monitoring of any one Model 3811 or 3911 dial/lease modem installed in the carrier. This panel enables audio signals (e.g., dial tone, busy signal, and ringing) to be heard during normal operations.

DSUs, DBMs, DBM-Vs, DBM-Ss, DBM-Ds, TDMs, MCMPs, and dial/lease modems can be managed from an SDCP, a Network Management System (NMS), or both. T1 CSUs and T1 DSU/CSUs are managed from an SDCP or remote PC. An SDCP or NMS can manage up to eight carriers and can control up to 128 compatible DSUs.

If more than one carrier is to be controlled by the SDCP, and/or if an NMS is to control the carriers, an SDU must be installed. The SDU then serves as the interface that links the carriers together so that one NMS and/or one SDCP can control the units in the cabinet(s).

NOTE

Although the SDCP is the last piece of equipment installed in the bottom of the carrier, the ribbon cable should be installed before installing the power transformer unit; it must be plugged into the backplane and run through the built-in retainer clips to the SDCP at the front of the carrier.

An alarm output is also available for connecting an external alarm device to all 16 DSUs and/or dial/lease modems in a carrier, or to an entire cabinet. It provides a relay contact that reports device and network failures to local alarm reporting networks in an equipment room. The relay is capable of switching up to 30 watts (resistive load), with a maximum voltage of 60 Vdc, and a maximum current of 1 amp for switching and 2 amps for the steady state.

Cabinet Unpacking and Setup

When shipped, COMSPHERE 72-inch cabinets are packed in cardboard shipping containers secured to wooden pallets. The shipping containers are bound with plastic straps. Inside the shipping container, the cabinet itself is strapped to the wooden pallet with plastic straps.

There is minimal clearance between the cabinet and the shipping container, and the cabinet frame is not wrapped in packing material.

Presetup Inspection

Before opening the shipping container, inspect it for signs of damage. Specific signs to check for are major tears or puncture holes on the sides of the container, splits in the seams, corner damage or any additional signs of the container having been dropped (badly damaged pallet, etc.).

If the shipping container does show signs of damage, report this immediately to your shipping representative and also to your AT&T Paradyne representative.

Unpacking the Cabinet

Using a utility knife, cut all plastic straps surrounding the container.

You will need to cut the container to unpack the cabinet. When cutting the container, do not cut along the container's seams. Doing so may damage the cabinet because of the lack of clearance.

Due to the bulk and weight of the cabinet, it is recommended that you cut around the base of the container to lift it off the cabinet. If your ceilings do not provide enough clearance, you may have to tip the container and cabinet sideways. You will need another person to help you tip the container and cabinet, and pull the container off.

Once the container is off, cut the plastic straps holding the cabinet frame to the pallet. Remove the packing material at the base of the cabinet and lift the cabinet to its desired location. You will need a large dolly to help you lift and move the cabinet to its planned location.

Cabinet Setup

The cabinet is shipped from the factory with doors, mounting rails, and two factory-installed ac power strips. Cabinet setup requirements are, therefore, minimal and consist of leveling the cabinet once it is in place at your site and, if needed, reversing the cabinet doors.

Leveling the Cabinet

There are four adjustable leveling screw feet at the bottom of the cabinet; these screw up or down, enabling you to adjust the cabinet to a level position on the floor. You can use a level if desired, and you will need an adjustable crescent wrench to rotate the feet to level the cabinet.

To level the cabinet:

Procedure

1. Place the level against the front door and adjust the leveling feet until the cabinet stands level vertically from front to rear.
2. Place the level against one cabinet side and adjust the leveling screws until the cabinet stands level vertically from side to side.

Reversing the Cabinet Doors

The cabinet's front and back hinged doors are installed on the cabinet frame at the factory to open left-to-right. You can use pre-drilled holes on the opposite side of the frame to reverse the door, allowing the door to open right-to-left.

To reverse a door:

Procedure

1. Supporting the door, use a flat-blade screwdriver to remove the screws from the bottom hinge, detaching the hinge from the cabinet frame.
2. Supporting the door, remove the screws from the top hinge, detaching the hinge and the door from the cabinet frame.
3. Flip the door end-over-end.
4. Holding the door in position on the opposite side, align the hinge holes with the predrilled holes on the cabinet frame provided for this purpose. Then use the same screws to reattach the door by its hinges to the cabinet.

Carrier Installation

You will need a large, Phillips screwdriver to install the carrier in the cabinet and to install the power transformer unit under the carrier. A small, flat-blade screwdriver is required to remove and replace the cover plate or SDCP, and to install the 50-pin cable connectors.

Each carrier is shipped with the following associated equipment:

- Six cable ties
- Two fuses (spares)
- Four #10-32 mounting screws
- Four cabinet (4000-B2-200) #12-24 mounting screws and four speed nuts for use with other cabinets
- One jumper wire for the frame ground/signal ground

These items are bundled together in a plastic bag.

The carrier and its associated auxiliary equipment are designed to be mounted in cabinets.

The carrier is equipped with reversible mounting brackets (Figure 3-2) to allow installation in cabinets that are either 19 inches or 23 inches wide. These brackets are initially positioned to allow the carrier to be installed in a cabinet on 19-inch centers.

Preinstallation Inspection

Remove the carrier from its shipping container and check for physical damage. If the carrier shows signs of shipping damage, report this immediately to your shipping representative and also to your AT&T Paradyne representative. Otherwise, proceed with the installation.

The COMSPHERE 3000 Series Carrier, Figure 3-1, is designed to house T1 CSUs, T1 DSU/CSUs, DSUs, DBM-Vs, DBM-Ss, DBM-Ds, TDMs, MCMPs, and dial/lease modems. The carrier is a metal enclosure that contains slots for installation of 17 circuit cards. The slot labeled SDU (Slot 0) is reserved for the Shared Diagnostic Unit (SDU); Slots 1 through 16 are for T1 CSUs, T1 DSU/CSUs, DSUs, DBM-Vs, DBM-Ss, DBM-Ds, TDMs, MCMPs, or dial/lease modems. Under each slot number (on the cover plate or SDCP) is a small area in which to write the circuit channel identification numbers.

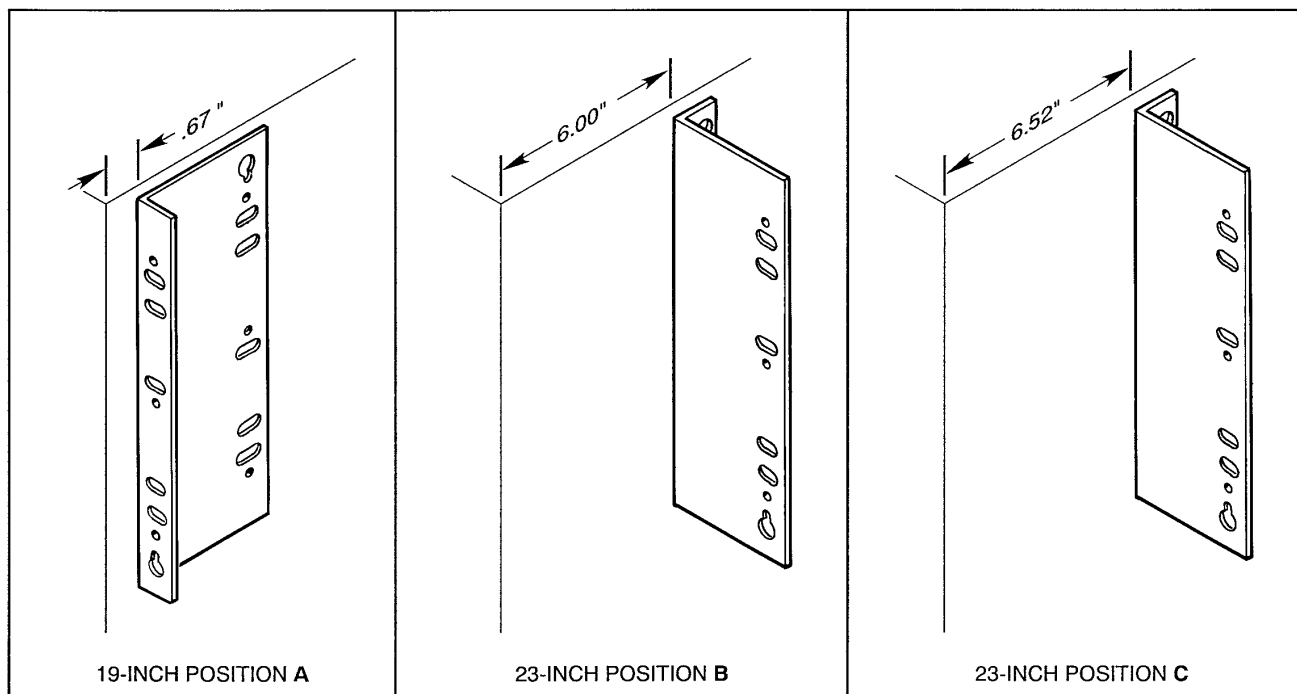


Figure 3-2. COMSPHERE 3000 Series Carrier Mounting Brackets

Installation

The cabinet that the carrier will be installed in may or may not have threaded screw holes.

- If the cabinet has threaded screw holes, use the short Phillip-head screws included in the hardware package and follow the first procedure in this section.
- If the cabinet does not have threaded screw holes, use the speed nuts and the longer Phillips-head screws (that look like washers are molded onto them) included in the hardware package and follow the second procedure in this section.

NOTE

Installing the carrier may be a 2 person task; one person to hold the carrier in proper alignment, and one person to install the screws.

To install the carrier in a cabinet that *has threaded screw holes*:

Procedure

1. If the carrier is to be installed in a 23-inch cabinet, you must reverse the mounting brackets. To do this, remove the screws that attach the mounting brackets to the sides of the carrier, then reverse the brackets and replace the screws.
2. Place the carrier against the front rails at the bottom of the cabinet, as shown in Figure 3-3, to determine where the two lower machine screws should be installed, then set the carrier aside. Use the larger screwdriver to install the two screws

loosely enough to allow the bracket keyholes to drop under the screw heads during installation.

3. Place the carrier against the front rails of the cabinet again, as shown in Figure 3-3, allowing the installed machine screws to pass through the keyholes. Lower the carrier into place, allowing the keyholes to slide under the screw heads.

This action positions the carrier correctly for installation of the two remaining machine screws and helps support its weight during installation of these screws.

4. Install the two remaining machine screws at the top corners of the carrier and tighten all four. Proceed to Step 5 of the following procedure.

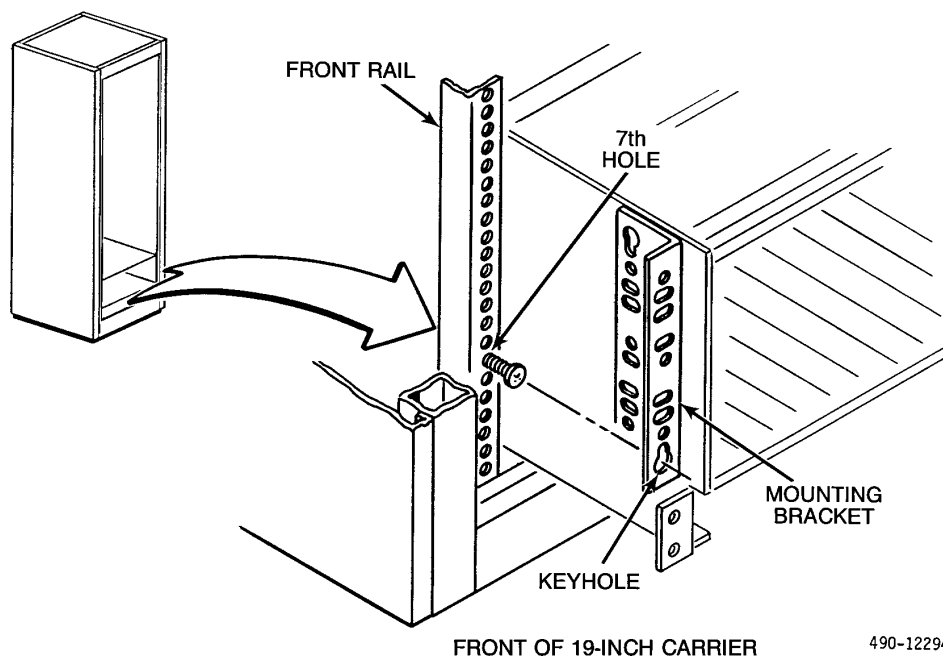


Figure 3-3. Installation of First Carrier into Cabinet with Threaded Screw Holes

To install the carrier in a cabinet that *does not have threaded screw holes*:

Procedure

1. If the carrier is to be installed in a 23-inch cabinet, you must reverse the mounting brackets. To do this, remove the screws that attach the mounting brackets to the sides of the carrier, then reverse the brackets and replace the screws.
2. Position the carrier in the cabinet and determine the front rail holes to be used.
3. Slip a speed nut onto each rail hole selected, as shown in Figure 3-4, and align the hole of the speed nut with the hole in the rail.
4. Line the carrier mounting bracket up with the speed nut, and start to screw the speednut screw into the carrier mounting bracket and the speed nut. Start all four screws, then tighten all four until the screw head is flush with the carrier and it is securely mounted in the cabinet.
5. Install the next carrier in the same manner (from the bottom up) using Steps 1 through 4. Up to six carriers can be installed in a cabinet (Figure 3-5).
6. If installing a carrier below existing carriers in a cabinet, it is possible that there will be insufficient vertical space to align with the holes in the mounting bracket. In this case, install the four machine screws directly through the holes in the mounting brackets and screw them firmly into the tapped holes in the mounting rails.

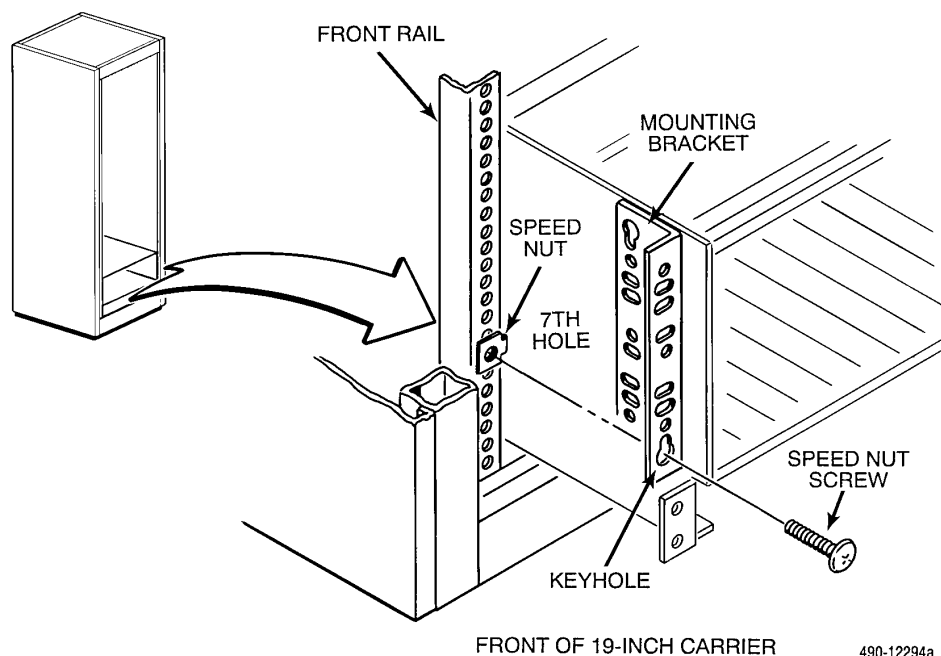


Figure 3-4. Installation of First Carrier into Cabinet with No Threaded Screw Holes

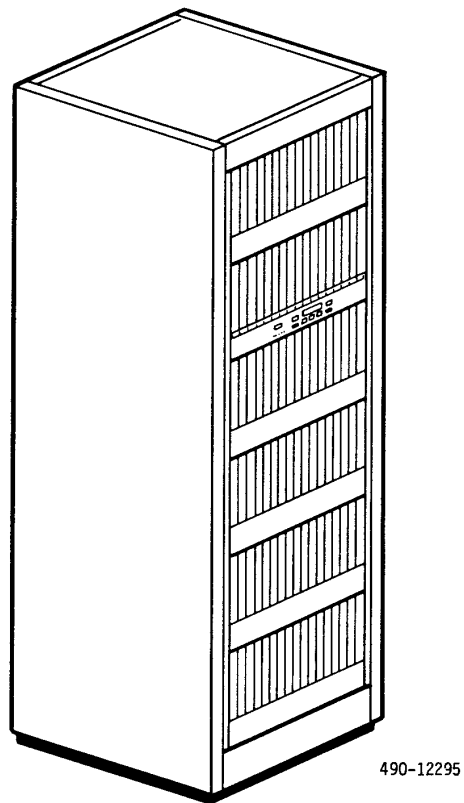


Figure 3-5. 72-Inch Cabinet Fully Configured with Six COMSPHERE 3000 Series Carriers

Power Transformer Unit Installation

The carrier derives its low voltage ac power from the power transformer unit mounted at the bottom of the carrier.

Preinstallation Inspection

Check the unit for physical damage. Ensure that the unit has not been damaged, possibly causing a short circuit of internal components. If the power transformer unit shows signs of shipping damage, report this immediately to your shipping representative and also to your AT&T Paradyne representative. Otherwise, tighten any screws that may have worked loose with a screwdriver and proceed with the installation.

If an SDCP is to be installed in the carrier, inspect the SDCP and its cable at this time, as well, and report any damage.

Installation

If installing an SDCP in the carrier, the ribbon cable that provides power to the SDCP must be installed before the power transformer unit is installed.

SDCP Ribbon Cable Installation

To install the SDCP ribbon cable:

Procedure

1. Decide on the most convenient height for the SDCP. This is usually at eye level (probably the second or third carrier from the top of the cabinet).
2. Remove the cover plate from the selected carrier by unscrewing the four captive screws (Figure 3-1).
3. At the front of the carrier (Figure 3-6), slide the fan module straight out and set it aside.

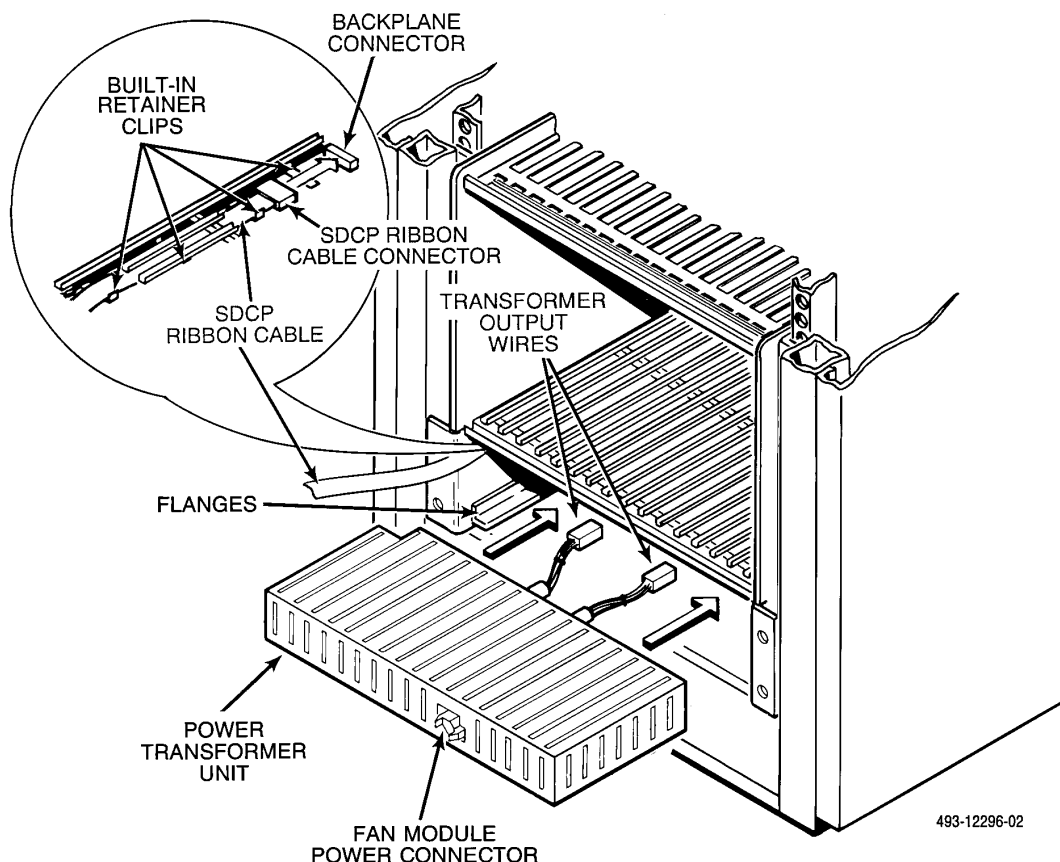


Figure 3-6. Power Transformer Unit Installation

4. At the rear of the carrier (Figure 3-7), disconnect the ac power cord from the carrier.

NOTE

Removing power causes loss of service to all 16 circuit card slots in the carrier. It is therefore recommended that this procedure not be performed during peak operating hours.

5. *If this is a new installation, proceed to Step 6. If the carrier has already been installed, you must remove the fan module (if installed) and the power transformer unit:*
 - a. At the rear of the carrier, unscrew the two captive screws securing the power unit. Disconnect the two power connectors (P19 and P20) by pressing the catch on the bottom of each and pull it free of its mating connector.
 - b. At the front of the carrier, slide the power transformer unit straight out and set it aside. You may need another person standing at the

rear to feed the transformer output wires through the opening in the backplane.

6. Attach either end of the 16-pin ribbon cable (delivered with the SDCP) to its connector on the carrier backplane. Feed the ribbon cable through the four built-in retainer clips provided in the carrier, then proceed to install the power transformer unit.

Power Transformer Unit Installation

To mount the power transformer unit in the carrier:

Procedure

1. If the SDCP ribbon cable has been installed, proceed to Step 2.

Remove the cover plate by unscrewing the four captive screws at the front of the carrier.

2. At the front of the carrier, place the power transformer unit on the flanges at the bottom of the carrier (Figure 3-6). Slide the power transformer unit into place against the rear rail of the enclosure, guiding the transformer output wires through the opening in the backplane.

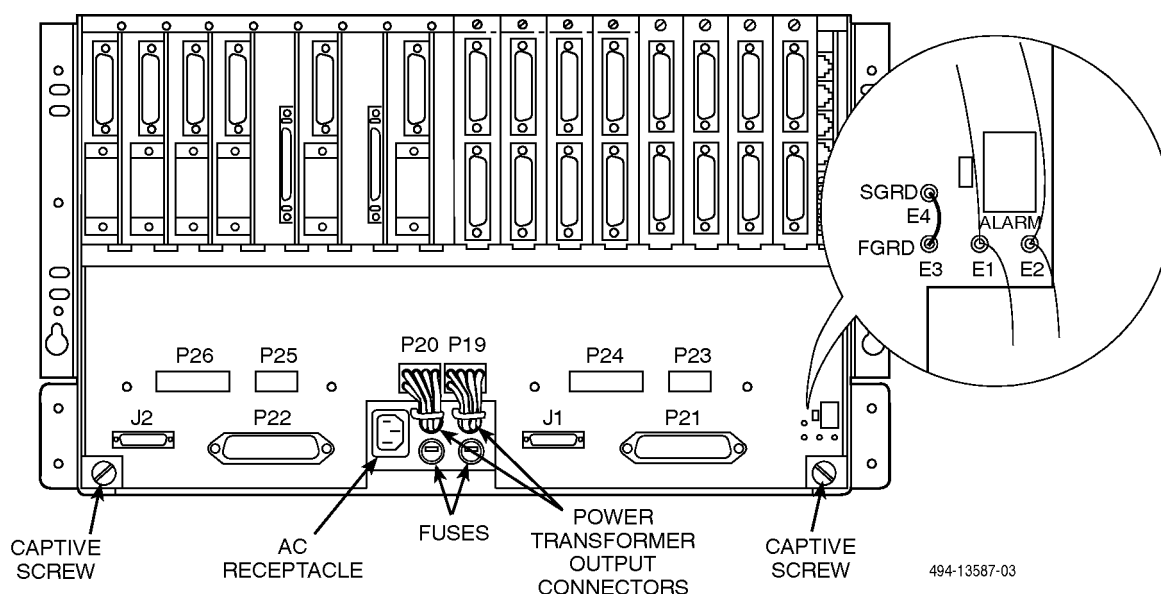


Figure 3-7. COMSPHERE 3000 Series Carrier (Rear)

NOTE

The power transformer unit output wires are terminated with plastic connectors. The power transformer unit must be installed so that the output wires protrude through the backplane at the rear of the carrier.

3. At the rear of the carrier (Figure 3-7), use the larger screwdriver to engage and tighten the two captive screws that fasten the power transformer unit to the carrier.
4. Plug the power transformer output connectors into the mating connectors on the backplane and latch them.

CAUTION

In Step 5, the power cord contains a 3-wire grounding-type plug which has a grounding pin. This is a safety feature. Grounding of the carrier is vital to ensure safe operation. Do not defeat the purpose of the grounding plug by modifying it or by using an adapter.

Prior to installation, use an outlet tester or voltmeter to check the ac receptacle for earth ground. If the power source does not provide a ground connection, consult an electrician to determine another method of grounding the carrier before proceeding with the installation.

5. Plug the appropriate end of the power cord into the ac receptacle on the carrier.
6. Plug the other end of the power cord into one of the convenience outlets inside the cabinet, or to an external ac outlet if the cabinet does not provide other outlets.

NOTE

In Step 7, the cover plate is installed at this time unless you are planning to install a fan module or SDCP.

7. If you are not installing a fan module or SDCP, replace the cover plate, then use the smaller screwdriver to engage and tighten the four captive screws.

SGRD/FGRD Connection

If all the DSUs and modems in the carrier are to have frame ground (FGRD) connected to signal ground (SGRD), install a wire strap (provided) between the SGRD and FGRD terminals at the rear of the carrier (Figure 3-7). The terminals are an insulation displacement type, with a slot designed to cut through the insulation on the wire.

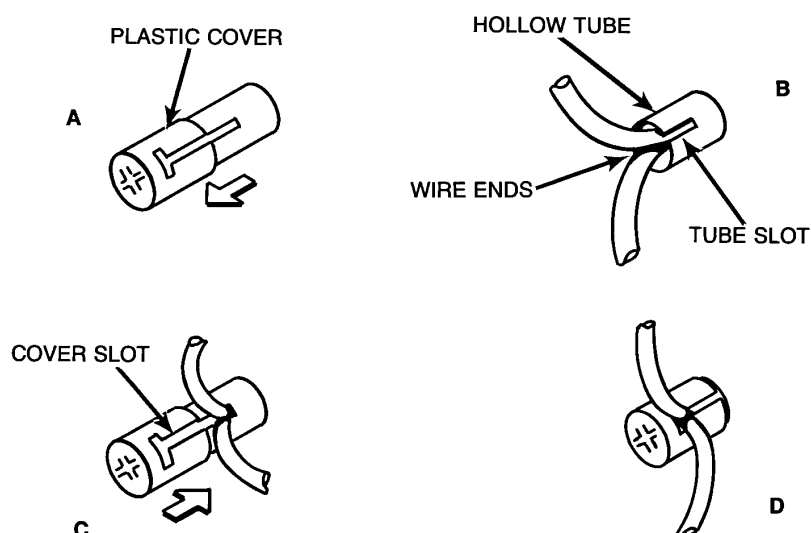
NOTE

Signal ground must not be connected to frame ground when 3900 Series Modems are installed in the carrier.

To install a wire strap between the SGRD and FGRD terminals:

**Procedure**

1. Use pliers to pull the plastic caps off the SGRD and FGRD terminals.
2. Insert one end of the strap into the SGRD terminal. It is not necessary to strip the wire.
3. Fit the strap into the slot in the terminal. Replace the plastic cap on the terminal, fitting the strap into the matching slot cut lengthwise in the cap (Figure 3-8).
4. Use a Phillips screwdriver to push the cap firmly onto the terminal. As you seat the cap, the terminal cuts through the insulation on the strap and makes contact.
5. Insert the other end of the strap into the FGRD terminal and repeat Steps 3 and 4.



490-12265

Figure 3-8. Alarm Output or Ground Strap Terminal Installation

Alarm Output Connection

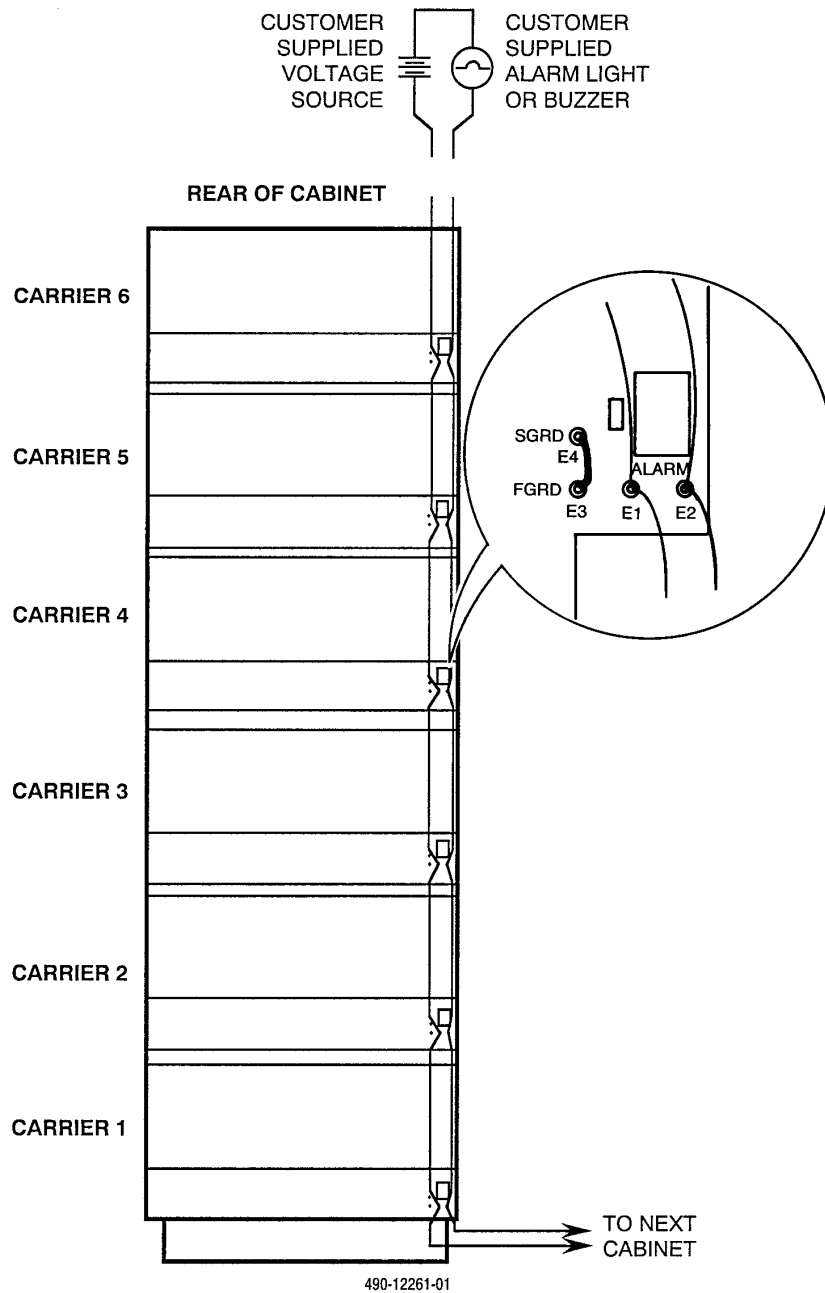
To connect the alarm output to an external light or buzzer, install the alarm or buzzer and voltage source as described in the instructions received with the light/buzzer and voltage source. Then, use the two ALARM terminals labeled E1 and E2 at the rear of the carrier to install two external device leads:

Procedure

1. Use pliers to pull the plastic caps off the E1 and E2 terminals (Figure 3-8, Step A).
2. Insert the end of the wire coming from the voltage source and the end of a wire to be connected to the next carrier into the E1 terminal. It is not necessary to strip the wires (Figure 3-8, Step B).
3. Fit the wires into the slot in the terminal. Replace the plastic cap on the terminal, fitting the wires into the matching slot cut lengthwise in the cap (Figure 3-8, Step C).

The last carrier to be connected only has one incoming lead installed and no outgoing lead.

4. Use a Phillips screwdriver to push the cap firmly onto the terminal. As you seat the cap, the terminal cuts through the insulation on the wires and makes contact (Figure 3-8, Step D).
5. Insert the other end of the wire to the next carrier's E1 terminal, if any, and repeat Steps 2 through 5 until all the carriers are linked together (Figure 3-9).
6. Insert the end of the wire coming from the alarm and the end of a wire to be connected to the next carrier into the E2 terminal, as described in Step 2.
7. Repeat Steps 3 through 5, connecting the E2 terminals instead, until all the carriers are linked together (Figure 3-9).

**Figure 3-9. Alarm Output Contacts**

Fan Module Installation

For installations where the ambient temperature is likely to be near the upper limit of the acceptable range (see Table 3-1), a fan module must be added to the carrier to provide forced air cooling.

Preinstallation Inspection

Check the unit for physical damage, such as broken blades. Spin fan blades manually to test for damage. If the fan module shows signs of damage, report this immediately to your shipping representative and also to your AT&T Paradyne representative. Otherwise, install the fan module.

Installation

The optional fan module is connected to the power transformer unit; therefore, this procedure assumes the power transformer unit has been installed.

To install the fan module:



Procedure

1. If the fan module is being installed after the carrier has been installed, loosen the four captive screws (see Figure 3-10) that attach the cover plate to the carrier and remove the cover plate. If an SDCP is not being installed, set the cover plate aside for reinstallation after the fan module has been installed.

Table 3-1
Fan Module Cooling Requirements

Ambient Temperature Range	Circuit Card Configuration ¹	Number of Carriers			
		1 – 2	3	4	5 – 6
39° – 86°F (4° – 30°C)	DSUs without DBMs and Model 3151 CSUs	No Fan Modules			1 fan module (place in second carrier from top)
	DSUs with DBM, and Model 3811 and 3911 dial/lease modems ²	No fan modules	1 fan module (place in middle carrier)	2 fan modules (place in bottom carrier and second from top)	1 fan module per carrier
	Model 3161 DSU/CSUs ²	1 fan module per carrier or 1 fan module per two carriers (placed in upper carrier)			
86°– 122°F (30°– 50°C)	Model 3161 DSU/CSUs ²	1 fan module per carrier (Limit of 3 carriers in a cabinet at temperatures above 40°C or 104°F) ³			

¹ Installing the TDM or MCMP option has no effect on this table.

² Use the strictest cooling requirements when there is a mixture of units installed.

³ Allow 1.75" (IU) spacing between carriers if more than 3 carriers are required.

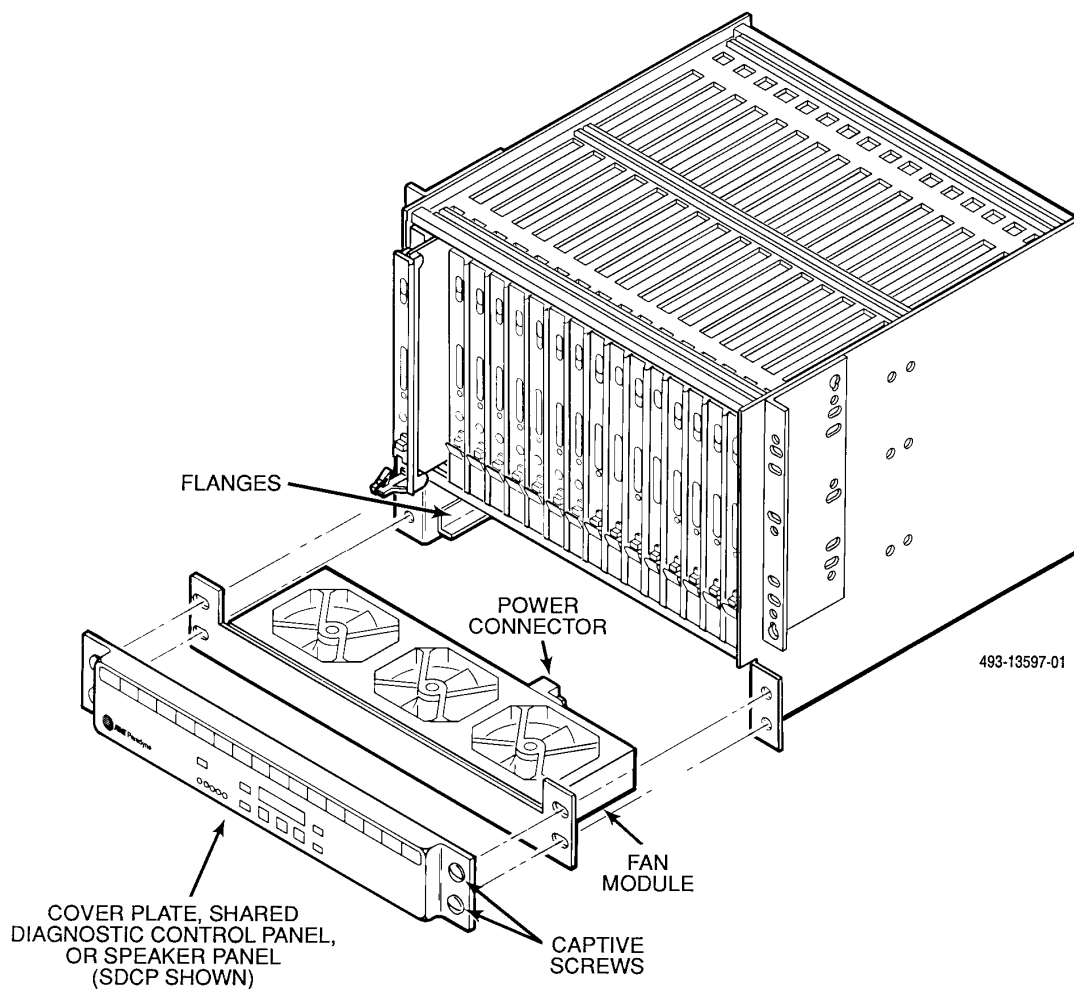


Figure 3-10. Fan Module Installation

2. Place the fan module on the flanges (Figure 3-10) at the bottom of the carrier with the power connector facing the mating power connector on the installed power transformer unit. Slide the fan module into the carrier until the power connectors engage firmly.
3. If the carrier is connected to ac power, the fans in the fan module will begin blowing air when the power connectors are engaged. If the carrier is not powered at this time, then provide power to it.

If the fan module does not operate, check the fuses on the back of the power transformer unit (Figure 3-7). If the fuses are blown, replace the fuses and determine the cause of the overload. If the fuses are okay, install the fan module in

another powered carrier (if possible, one with a working fan module).

If the fan module still does not work, replace the fan module. If it works in a different carrier, replace the power transformer unit of the first carrier.

4. If you are not going to install an SDCP or speaker panel, reposition the cover plate over the installed fan module. Use the smaller screwdriver to engage and tighten the four captive screws.

If you are going to install an SDCP, proceed to the Shared Diagnostic Control Panel (SDCP) Installation procedure.

If you are going to install a speaker panel, proceed to the Speaker Panel Installation procedure.

Shared Diagnostic Control Panel (SDCP) Installation

A single Shared Diagnostic Control Panel (SDCP) can control up to eight carriers containing up to 128 compatible T1 CSUs, T1 DSU/CSUs, DSUs, or dial/lease modems. The number of devices that can be installed in a carrier or cabinet is reduced when Time Division Multiplexer (TDM) or Multichannel Multipoint (MCMP)

circuit cards are also installed. A TDM or MCMP circuit card (functioning as a multiplexer or digital bridge) is physically attached to Models 3551, 3611, and 3616 DSUs and occupies a separate slot in the carrier. In a single carrier without an NMS connection, an SDU is not required to provide the SDCP interface. In a cabinet configuration of two or more carriers, however, an SDU is required in each carrier to connect the SDCP interface from carrier to carrier. Figure 3-11 shows the SDCP and Table 3-2 defines the SDCP status indicators.

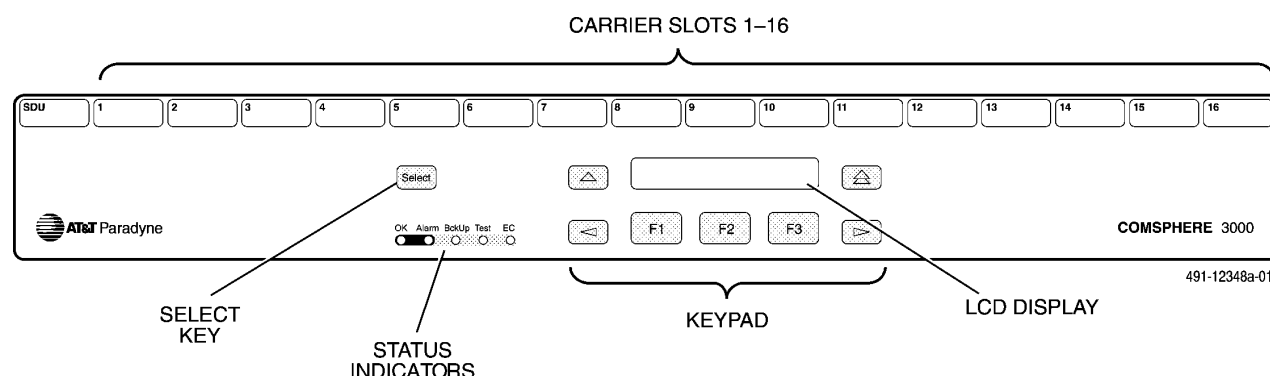


Figure 3-11. Shared Diagnostic Control Panel

Table 3-2
Shared Diagnostic Control Panel Status Indicators

Label	Color	Description
OK	green	Health and status indicator for the selected 3151/3161/3551/3611/3616/3811/3911; mirrors the OK indicator on the 3151/3161/3551/3611/3616/3811/3911 faceplate and the power indicator on the 3811/3911.
Alarm	red	Health and status indicator for the selected 3151/3161/3551/3611/3616/3811/3911; mirrors the Alarm indicator on the 3151/3161/3551/3611/3616/3811/3911.
BckUp	yellow	Mirrors the Dial indicator on the selected 3551/3611/3616/3811/3911. Not used for the 3151/3161.
Test	yellow	Mirrors the Test indicator on the selected 3151/3161/3551/3611/3616/3811/3911.
EC	green	Error Correction indicator for use by 3811/3911 modems. Not used for the 3151/3161/3611/3616.

Preinstallation Inspection

Check the unit for physical damage. Ensure that the SDCP and ribbon cable are not damaged. If the SDCP or its cable shows signs of damage, report this immediately to your shipping representative and also to your AT&T Paradyne representative. Otherwise, install the ribbon cable as described in the *Power Transformer Unit Installation* section, then install the SDCP as described here.

Installation

The optional SDCP ribbon cable shown in Figure 3-12 is connected to the carrier backplane before the power transformer unit and optional fan module are installed. Refer to the *Power Transformer Unit Installation* section to connect the SDCP ribbon cable to the backplane, then continue with the following installation procedure.

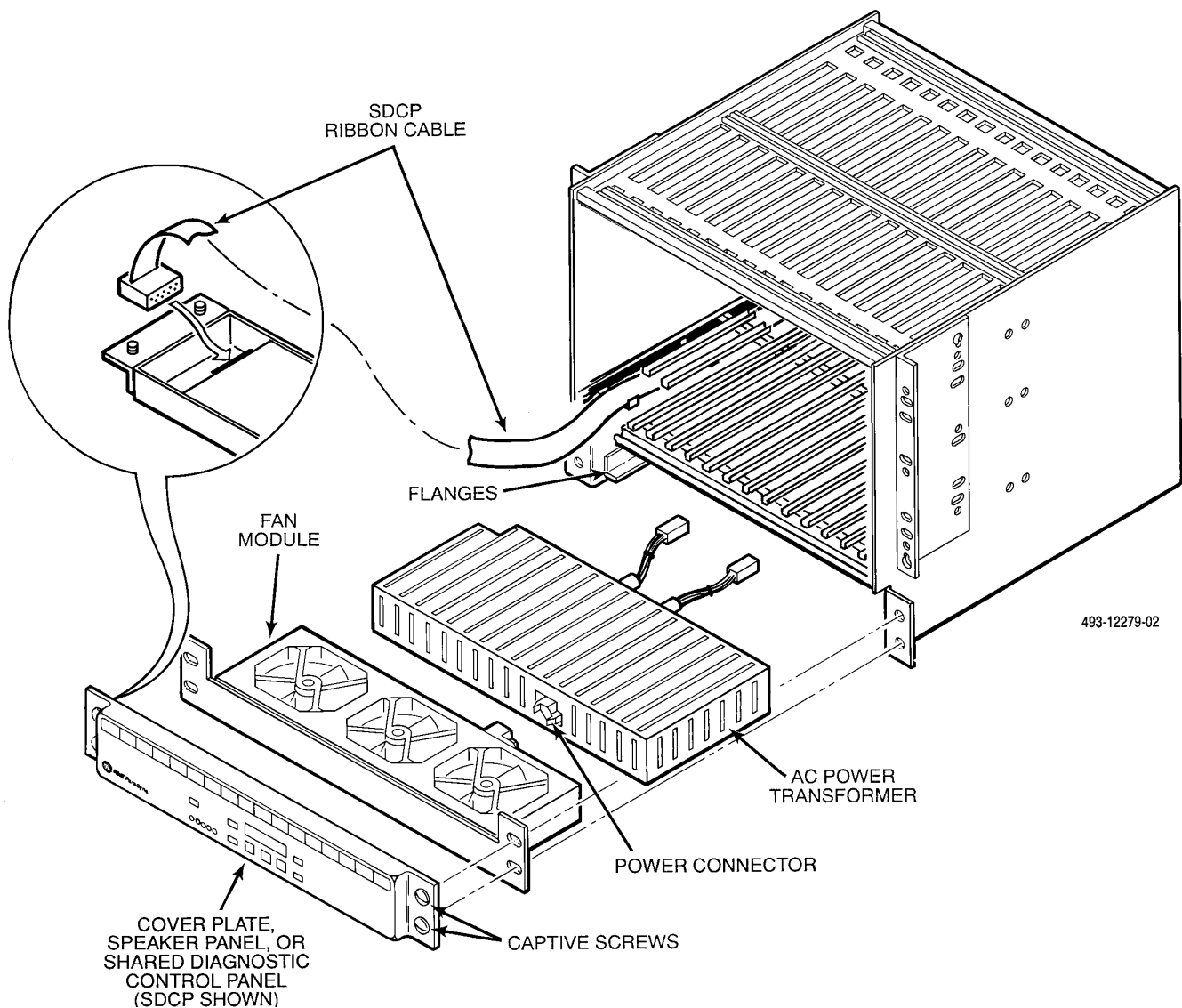


Figure 3-12. Shared Diagnostic Control Panel (SDCP) Installation

Procedure

1. Attach the other end of the SDCP ribbon cable to the back of the SDCP, as shown in Figure 3-12.
2. Secure the panel to the front of the carrier with its four captive screws, using the same screw holes that held the blank cover plate.
3. The display on the SDCP should light up immediately. If it does not, check the ac power connections at the rear of the carrier and the two fuses at the rear of the power transformer unit. If necessary, make sure that both ends of the SDCP ribbon cable are seated securely in their connectors. If the SDCP still does not light up, call your AT&T Paradyne representative.
4. For a cabinet configuration with multiple carriers, install the SDUs in the appropriate carriers, then connect all of the SDUs in a daisy chain. Use an 8-pin modular telephone cord to connect the **FP OUT** jack at the rear of the SDU in this carrier to the **FP IN** jack of the SDU in the next carrier above or below it (see the *Shared Diagnostic Unit (SDU) Installation* and *NMS Connection* sections of this chapter). Use another cord to connect the second SDU's **FP OUT** jack to the next SDU's **FP IN**. Continue to the last carrier in the cabinet.

Once devices have been installed (refer to the *Circuit Card Installation* section), test the SDCP's ability to address the devices.

Procedure

1. Press **Select**.
2. Enter a valid carrier and slot address. (Refer to the *Shared Diagnostic Unit (SDU) Installation* section of this chapter for information on carrier addresses.) For Model 3151 CSUs and Model 3161 DSU/CSUs, the green **OK** indicator flashes. It should be the only **OK** indicator flashing in the cabinet. For all devices but T1 CSUs and T1 DSU/CSUs, the yellow **Front Panel** indicator on the selected device should light. (It should be the only **Front Panel** indicator lit in the cabinet.)
3. Press **Select** again. The display on the SDCP should show the last menu displayed, or in the case of a new installation, the top-level menu on the selected device.

Speaker Panel Installation

An optional speaker panel can be installed to provide audio monitoring of any Model 3811 or 3911 dial/lease modem installed in a cabinet of COMSPHERE 3000 Series Carriers. If there is only one carrier in the cabinet and no SDCP is installed, the speaker panel can be mounted directly to the carrier in place of the cover plate (as shown in Figure 3-10). If there is more than one carrier in the cabinet, the speaker panel should be mounted on a carrier without the SDCP. If there is only one carrier in the cabinet and an SDCP is mounted on the carrier, the speaker panel may be mounted directly to the front rail, as shown in Figure 3-13.

Preinstallation Inspection

Check the speaker, speaker jack, and panel for physical damage. If there are signs of damage, report this immediately to your shipping representative and your AT&T Paradyne representative.

Installation

If the carrier has a cover plate installed, use Figure 3-10 and begin at Step 1 of the following procedure. If the carrier has an SDCP installed, use Figure 3-13 and begin with Step 2 of the following procedure to mount the speaker panel to the cabinet's front rails.

Procedure

1. To install the speaker panel directly to the carrier, remove the cover plate and then secure the speaker panel to the front of the carrier using its four captive screws. Use the same screw holes that held the cover plate in place (see Figure 3-10). Continue to Step 6.

2. To install the speaker to the cabinet's front mounting rails, first determine if you want to mount the speaker panel above or below the carrier. Then, fasten one of the speaker panel mounting brackets to a front mounting rail with a #10 Phillips-head screw (supplied). See Figure 3-13.

NOTE

If your cabinet has unthreaded rails, first attach a speed nut to the rail hole you intend to use. Then, fasten a bracket to the mounting rail using a supplied #12 screw (the longer Phillips-head screw).

3. Verify that this is the position in which you want to mount the panel by holding the panel against the bracket and aligning the panel's captive screws with the bracket's screw post. (For appearance, you can adjust the bracket's position to eliminate space between the speaker panel and carrier.)

If necessary, loosen the bracket and make any necessary adjustments.

4. Fasten the second speaker panel bracket to the other mounting rail to match the first bracket's position.

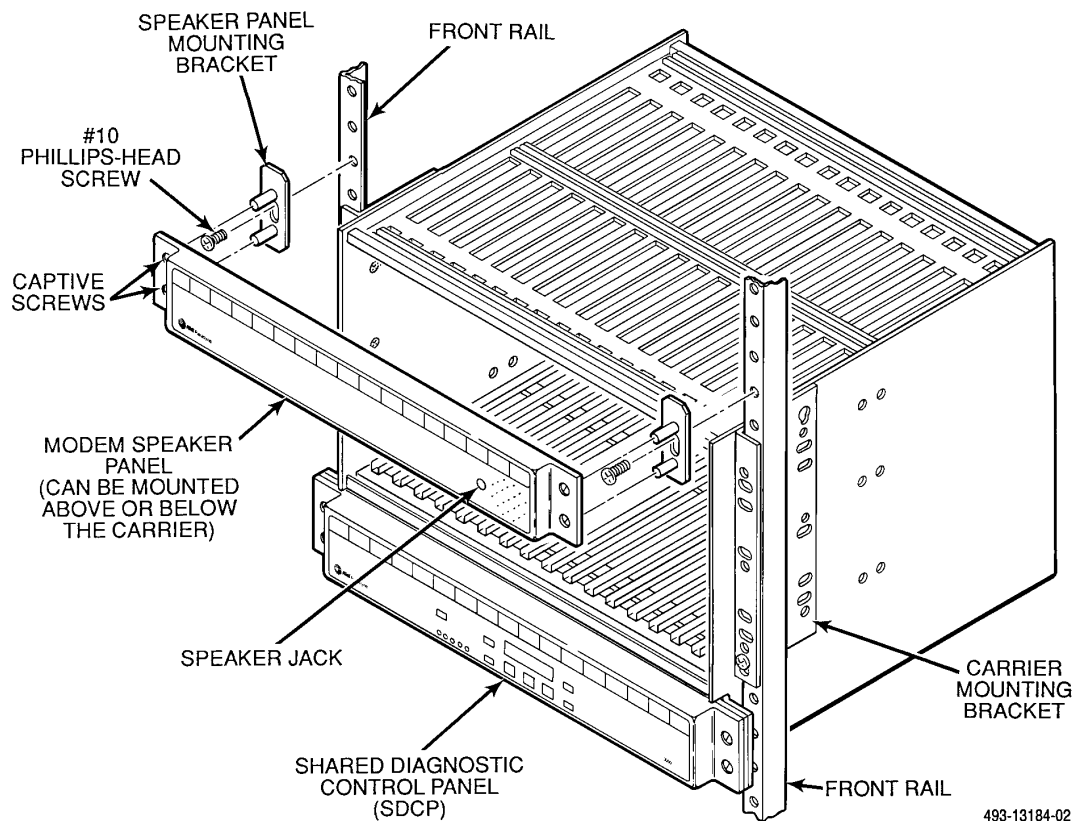


Figure 3-13. Models 3811/3911 Speaker Panel Installation Directly to Cabinet Rails

5. Once the brackets are installed, use a small flathead screwdriver to tighten the speaker panel's four captive screws to the mounting brackets.
6. Once the speaker panel is installed, verify that the speaker is working. Connect one end of the supplied coiled cable into the speaker panel's jack labeled **Spkr** and the other end into any Model 3811's or 3911's speaker jack labeled **Spkr**.
7. If the cabinet has an SDCP, press Select and enter a valid carrier and slot address for the modem used in Step 6. The **Front Panel** status indicator on the Model 3811's or 3911's faceplate lights, indicating that it is connected to the SDCP.
8. Using the SDCP, scroll the menu until the Control branch appears on the LCD. Enter the Control branch and select the Speaker function. Select a speaker setting of Low, Medium, or High and then place a call to hear the dialing sequence.

NOTE

This is only a temporary setting. Upon a reset, the modem returns to its default setting, Medium. To change the default setting, refer to the *COMSPHERE 3800 Series Modems, Models 3810, 3811, and 3820 User's Guide* or the *COMSPHERE 3900 Series Modems, Models 3910 and 3911, Point-to-Point/Multipoint Installation and Operation Manual*.

If you do not have an SDCP installed and are using AT commands, use the **ATM** command to turn the speaker ON and the **ATL** command to adjust the speaker volume.

Shared Diagnostic Unit (SDU) Installation

An SDU (Figure 3-14), which is a circuit card designed to mount in the slot at the extreme left end of the carrier (Slot 0), is required under either or both of the following conditions:

- The DSUs or dial/lease modems in the carrier are to be controlled by an NMS.
- Multiple carriers in a cabinet configuration are to be controlled from a single SDCP.

The SDU is not required for a single carrier without an NMS interface or a single carrier with an SDCP installed.

At the rear of the SDU circuit card are four modular jacks (Figure 3-15). From the top down, these jacks are as follows:

- CC IN (6-pin)
- CC OUT (6-pin)
- FP IN (8-pin)
- FP OUT (8-pin)

SDU status indicators are defined in Table 3-3.

Below these connectors are two sets of DIP switches:

- S2** (The top DIP switch) is used to specify the carrier address (1–8) so that each device in a cabinet configuration has a unique identity. Only the first three switches (S2-1 through S2-3) are operational; the fourth switch (S2-4) is reserved for future use.
- S1** (The bottom DIP switch) is used to specify the diagnostic protocol to be supported (DP11, ADp, or DMC), and the CC or DC operation to be supported for DP11 and ADp protocol modes.

Preinstallation Inspection

Check the SDU for physical damage. Ensure that the circuit card and faceplate are not damaged. If the SDU shows signs of damage, report it immediately to your shipping representative and also to your AT&T Paradyne representative. Otherwise, install the unit.

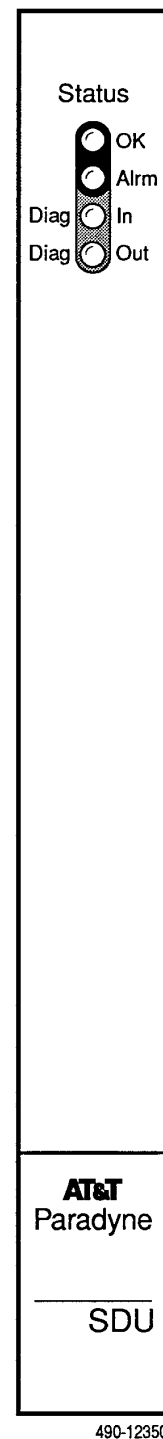


Figure 3-14. SDU Faceplate

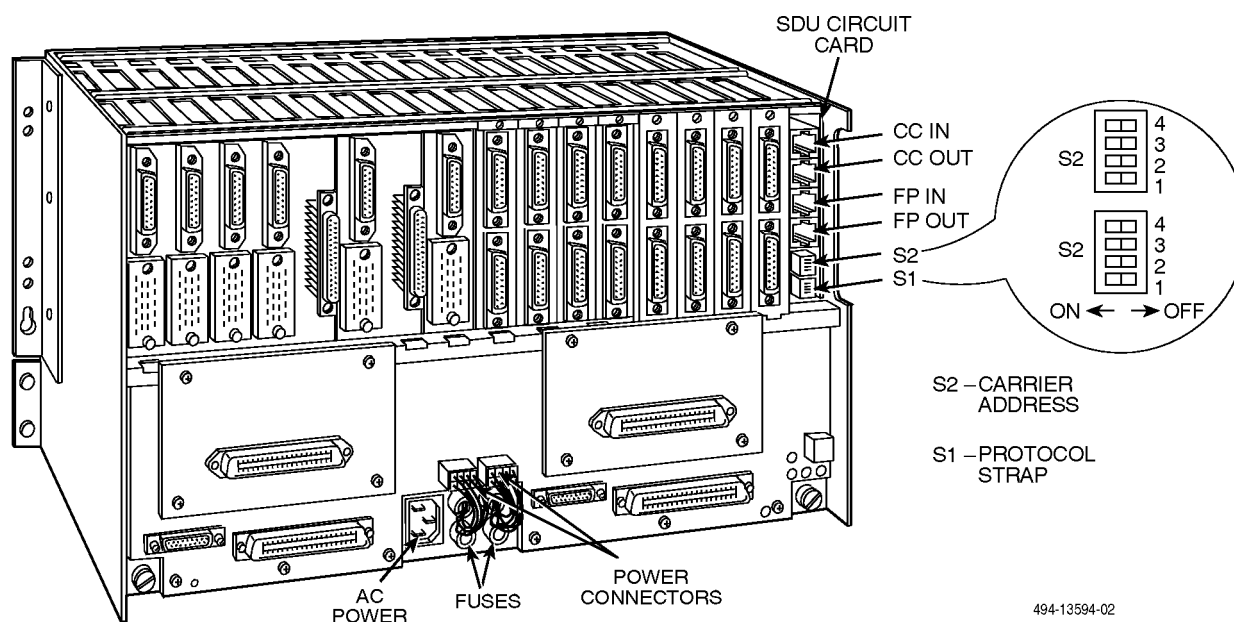


Figure 3-15. Shared Diagnostic Unit Circuit Card, Rear View

Table 3-3
Shared Diagnostic Unit Status Indicators

Label	Color	Description
OK	green	Normal operation.
Alrm	red	Fault in SDU.
Diag In	yellow	Incoming message from NMS (to a DSU, DBM, or Model 3811 or Model 3911 modem in the carrier).
Diag Out	yellow	Outgoing message to NMS (from a DSU, DBM, or Model 3811 or Model 3911 modem in the carrier).

Installation

To install the SDU in its dedicated slot in the carrier (Slot 0):

Procedure

1. Set the carrier address DIP switches (S2-1, S2-2, and S2-3) on the rear of the card, as specified in Table 3-4. Note that each carrier in a cabinet mounting must have a unique address (Switch S2).
 - a. For a single carrier, leave the switches set for Carrier 1, which is the factory default.
 - b. To populate a new cabinet with an NMS control channel dedicated to DSUs, use the Carrier 1 setting for the first carrier, usually at the bottom of the cabinet. Use the Carrier 2 setting for the next carrier up from the bottom. Continue to the Carrier 6 setting, if necessary, for the top carrier. If there are more than eight carriers in a single installation, continue with the Carrier 7 and Carrier 8 settings for the

second cabinet. The next COMSPHERE 3000 Series Carrier is numbered 1, but is on a different control channel.

- c. To add a COMSPHERE 3000 Series Carrier to an existing control channel, use Table 3-5 to determine the new carrier's address provided the DSU's software version (DSU SW ver) is less than 4.25. (When the DMC protocol is used, the ANALYSIS system calculates the carrier address automatically so you can enter it.) The limitations shown in Table 3-5 do not apply when the DSU SW version is 4.25 or greater.
- d. Write the carrier number on the slot label for the SDU (slot labels are located under each slot on the SDCP or cover plate).
2. Set the protocol DIP switches (S1-1 and S1-2) on the rear of the circuit card to the protocol required (Table 3-6). If connecting to a network control channel, set the CC option. If connecting to the diagnostic channel of an upstream device (modem), set the DC option.

Table 3-4
Carrier Address DIP Switches

Switch	Carrier Address							
	1 ¹	2	3	4	5	6	7	8
S2 – 4	—	—	—	—	—	—	—	—
S2 – 3	Off	Off	Off	Off	ON	ON	ON	ON
S2 – 2	Off	Off	ON	ON	Off	Off	ON	ON
S2 – 1	Off	ON	Off	ON	Off	ON	Off	ON

¹ Factory default setting:
ON is to the left as you face the rear of the carrier.
Off is to the right.

Table 3-5
Carrier Address Assignment

Highest Existing Network Address*		First New Carrier Address
DATAPHONE II	ADp	
011 – 048	01 – 32	2
051 – 088	33 – 64	3
091 – 28	65 – 96	4
131 – 68	97 – 128	5
171 – 208	129 – 160	6
211 – 248	161 – 192	7
251 – 288	193 – 224	8
291 – 328	225 – 256	**
* For the DMC protocol, the carrier address is automatically calculated by ANALYSIS 6510 if the DSU software version is less than 4.25. When the DSU software version is 4.25 or greater, devices are addressable independent of the carrier. ** It is recommended that you start a new control channel when the carrier address reaches this limit.		

Table 3-6
Protocol DIP Switches

Switch	Protocol		
	DPII/ADp, CC*	DPII/ADp, DC	DMC
S1 – 4	—	—	—
S1 – 3	—	—	—
S1 – 2	Off	ON	ON or Off
S1 – 1	Off	Off	ON
* Factory default setting: ON is to the left as you face the rear of the carrier. Off is to the right.			

3. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock and rotate the lock to the open position (Figure 3-16).
4. At the front of the carrier, hold the SDU vertically with the faceplate latch in the open position, and insert the circuit card into the top and bottom card guides of the slot labeled **SDU**, to the left of Slot 1. Slide the circuit card into the slot until the backplane connector is seated firmly. Press the latch to secure the SDU in the carrier, rotate the circuit pack lock back into the closed position and tighten the screw.

If the carrier's power transformer unit is operating, all indicators on the SDU's faceplate light briefly as the SDU performs a self-test routine. On completion of the test, all indicators go off except the green **OK** indicator. If there is an NMS

connection and DSUs in the carrier that are on the NMS' or modem's poll list, the yellow **Diag In** and **Diag Out** indicators also flicker periodically as the NMS polls the devices in the carrier.

5. After at least one DSU or modem has been installed in the carrier, check that the SDU is functioning properly by polling selected DSUs or modems for health and status.
 - If there is an NMS connection, poll the DSUs or modems for health and status (refer to the NMS Connection section).
 - If the SDCP is already installed, select each DSU or modem in turn and request its health and status (refer to the *Shared Diagnostic Control Panel (SDCP) Installation* section).

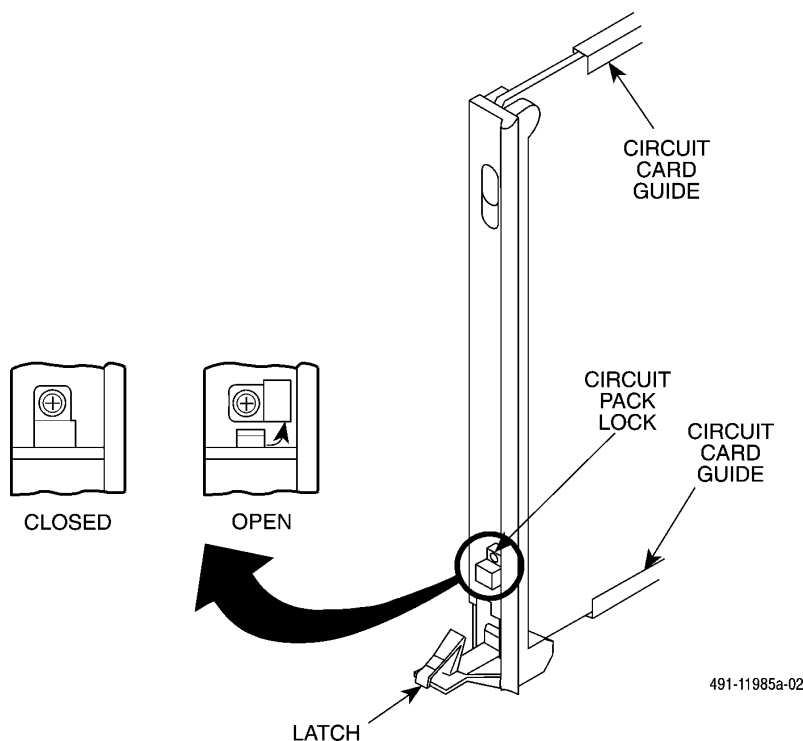


Figure 3-16. Circuit Pack Lock

NMS Connection

A COMSPHERE 3000 Series Carrier can be connected to a variety of Network Management Systems (6800 Series NMS, 6700 Series NMS, DATAPHONE II Level 4 System Controller, DATAPHONE II Diagnostic Console, DATAPHONE II Network Controller, and ANALYSIS 6510 NMS) via the control channel interface on the SDU, but all 16 slots in the carrier can only be controlled by one Network Management System. One control channel can manage up to eight COMSPHERE 3000 Series Carriers by daisy chaining from the **CC IN** to the **CC OUT** interfaces on the SDU in each carrier.

NOTE

You cannot use the NMS connected through the SDU with either Model 3151 CSUs or 3161 DSU/CSUs.

The types of NMS that can connect to the COMSPHERE 3000 Series Carrier have a variety of physical and electrical interfaces. The control channel **CC IN** interface on the SDU, where the NMS is connected to the COMSPHERE 3000 Series Carrier, is a 6-pin modular jack. For each type of NMS, a specific adapter is required to convert the control channel interface from the NMS to the 6-pin modular plug required for the SDU. The adapters required are described below.

- The COMSPHERE 6800 Series NMS, 6700 Series NMS, ANALYSIS 6510 NMS, and later releases of the DATAPHONE II Level 4 System Controller use a 25-pin EIA-232 interface and a gender adapter. The 25-pin to 6-pin adapter for a central site is AT&T Paradyne feature number 4400-F1-594; for the remote site, it is 6821-F1-518. The ANALYSIS gender adapter is AT&T Paradyne part number 4951-031. In addition, a 6-conductor cord with 6-pin plugs on each end can be used to make this connection. This cord is AT&T Paradyne feature number 4400-F1-510 (3 feet).

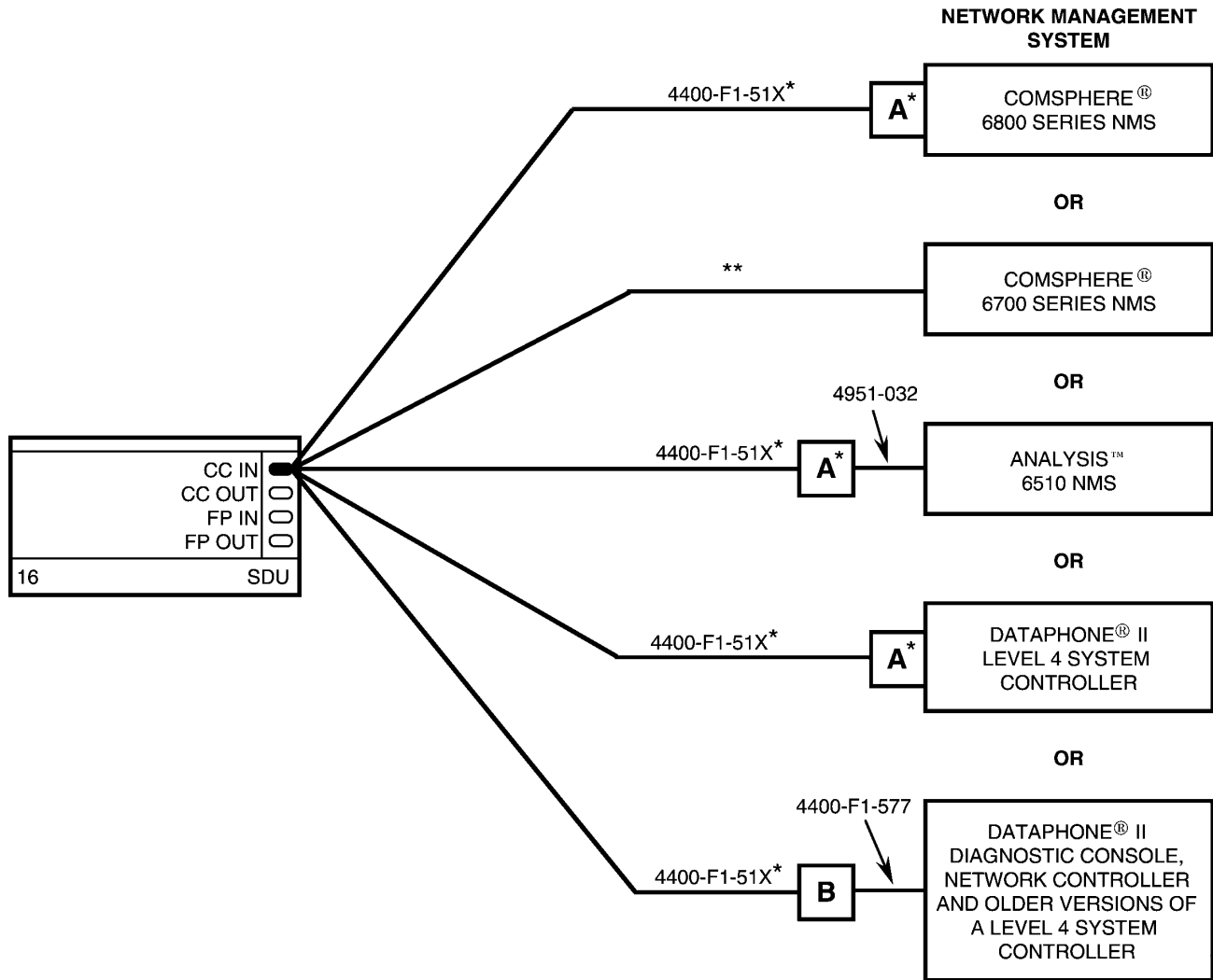
You can also connect a remote NMS to a COMSPHERE 3000 Series Carrier via a Modular 3551, 3611, or 3616 DSU and an NMS adapter cable (feature number 3000-F2-510). For information on how to install the NMS adapter cable, refer to the appropriate user documentation.

- The DATAPHONE II Diagnostic Console, Network Controller, and older releases of a Level 4 System Controller use a 10-pin interface for the Control Channel. The 10-pin to 6-pin cable is AT&T Paradyne feature number 4400-F1-577 (5 feet). Use this adapter when the DSUs in the carrier are controls on the backbone network.

To connect the local NMS to the COMSPHERE 3000 Series Carrier:

Procedure

1. Obtain the correct adapter, as described above, and connect it to the network management port on the NMS device (on the COMSPHERE and DATAPHONE II systems, the port is labeled **CC OUT** or **DC OUT**). (See Figure 3-17 for an NMS to a COMSPHERE 3000 Series Carrier connection, Figure 3-18 for a diagnostic channel daisy chain of devices into a COMSPHERE 3000 Series Carrier, and Figure 3-19 for a diagnostic channel daisy chain of devices from a COMSPHERE 3000 Series Carrier.)
2. Use a 6-pin modular telephone cord to connect the modular side of the adapter to the **CC IN** jack on the rear of the SDU in the COMSPHERE 3000 Series Carrier (Figure 3-20).
3. For a cabinet configuration with multiple carriers, connect all of the SDUs in a daisy chain, starting with the SDU connected to the NMS. Use a 6-pin modular telephone cord to connect the **CC OUT** jack at the rear of this SDU to the **CC IN** jack of the SDU in the next carrier above or below it. Use another cord to connect the second SDU's **CC OUT** jack to the next SDU's **CC IN**. Continue to the last carrier in the cabinet.
4. After at least one DSU has been installed in the carrier, check that the SDU is functioning properly by polling the DSUs for health and status.

**NOTES:**

A 4400-F1-594 ADAPTER

B 4400-F1-591 ADAPTER

* FEATURE NUMBER 6821-F1-513 INCLUDES BOTH THE 4400-F1-512 (50 FOOT) CABLE AND THE 4400-F1-594 ADAPTER

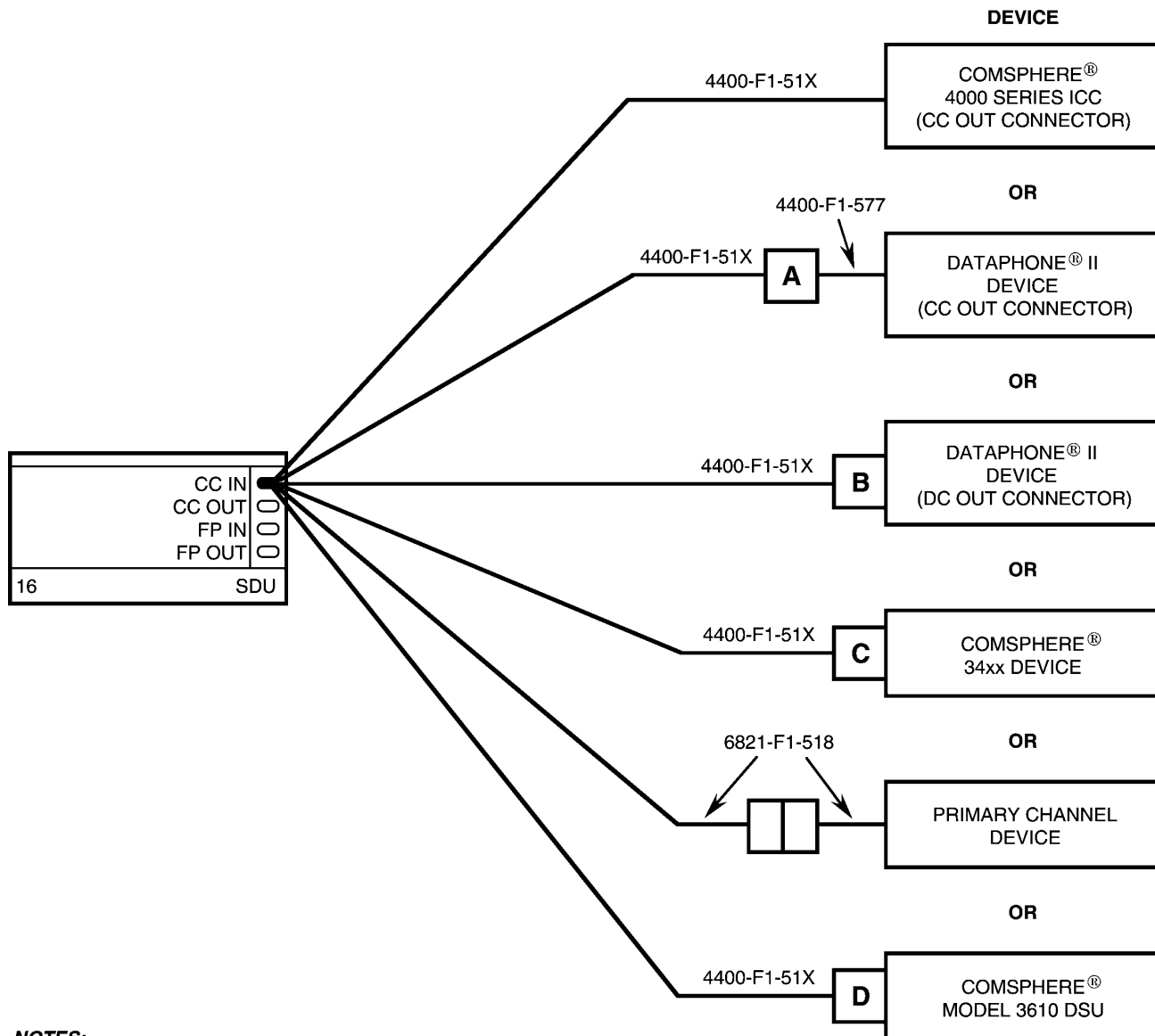
** THE CABLE IS PROVIDED WITH THE 6700 SERIES NMS SOFTWARE PACKAGE

6-PIN MODULAR CABLES

4400-F1-510	3.0'
4400-F1-511	10.0'
4400-F1-512	25.0'

493-13591-02

Figure 3-17. NMS to a COMSPHERE 3000 Series Carrier Connection



493-13592-02

Figure 3-18. Daisy Chaining of Devices into a COMSPHERE 3000 Series Carrier

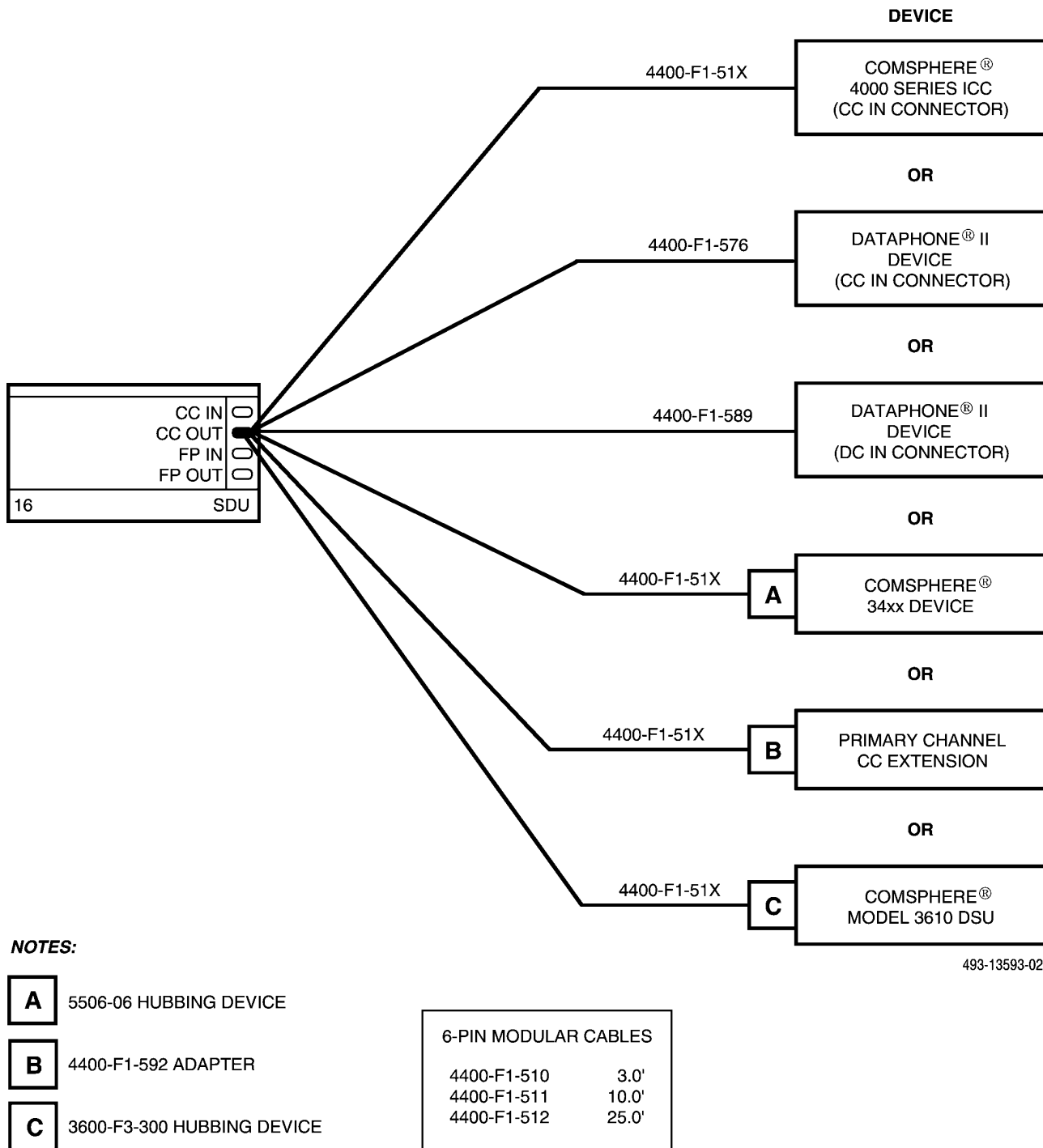


Figure 3-19. Daisy Chaining of Devices from a COMSPHERE 3000 Series Carrier

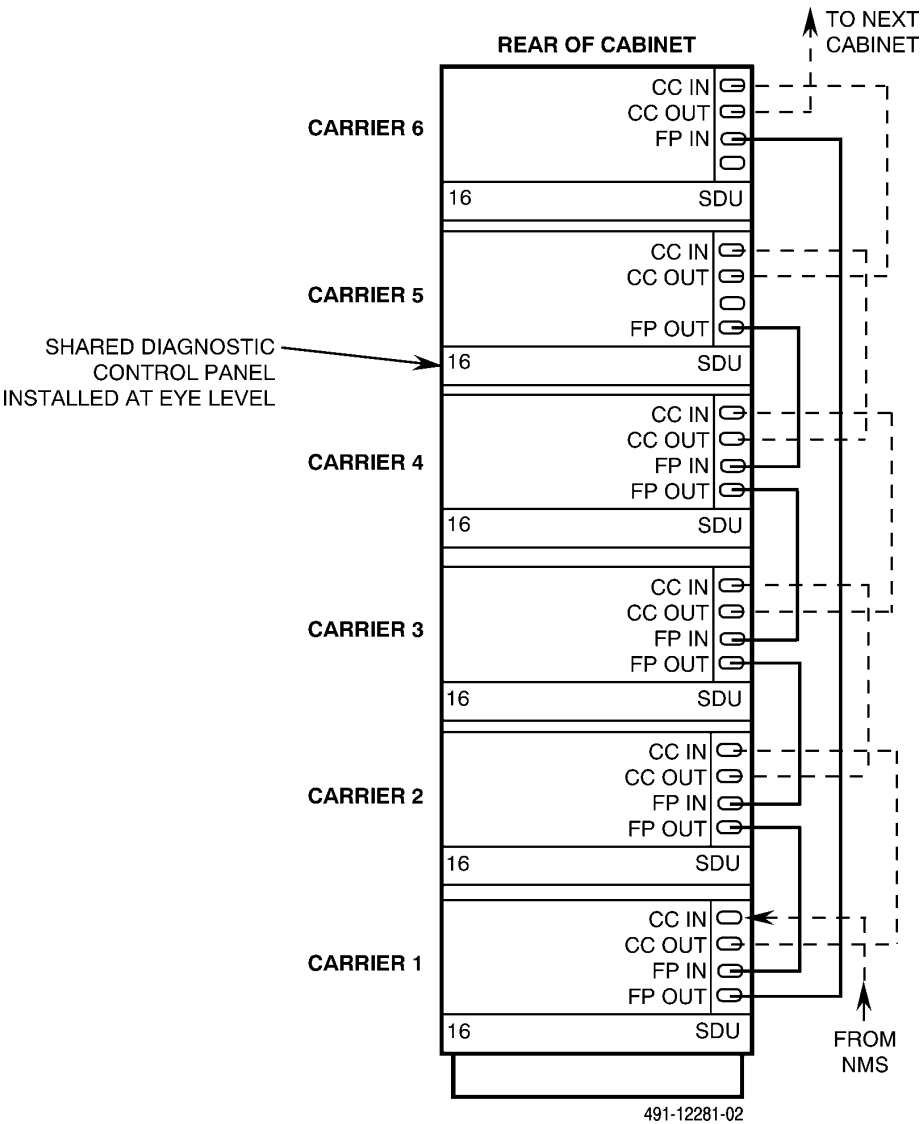


Figure 3-20. NMS and Shared Diagnostic Control Panel Interface Connections

Auxiliary Backplane Installation

The Auxiliary Backplane assembly can be mounted on either the left-hand side of the COMSPHERE 3000 Series Carrier (as viewed from the front) to cover Slots 1–8, or it can be placed on the right-hand side to cover Slots 9–16. A single carrier can be equipped with two Auxiliary Backplane assemblies. Figure 3-21 shows the Auxiliary Backplane in position to be installed over Slots 9–16 of the 3000 Series Carrier.

NOTE

If modular 3600 Series DSU or dial/lease modem circuit cards with “gold finger” contacts are installed in the carrier, mount the Auxiliary Backplane on the right-hand side (over Slots 9–16), or Slot 9 will become unusable.

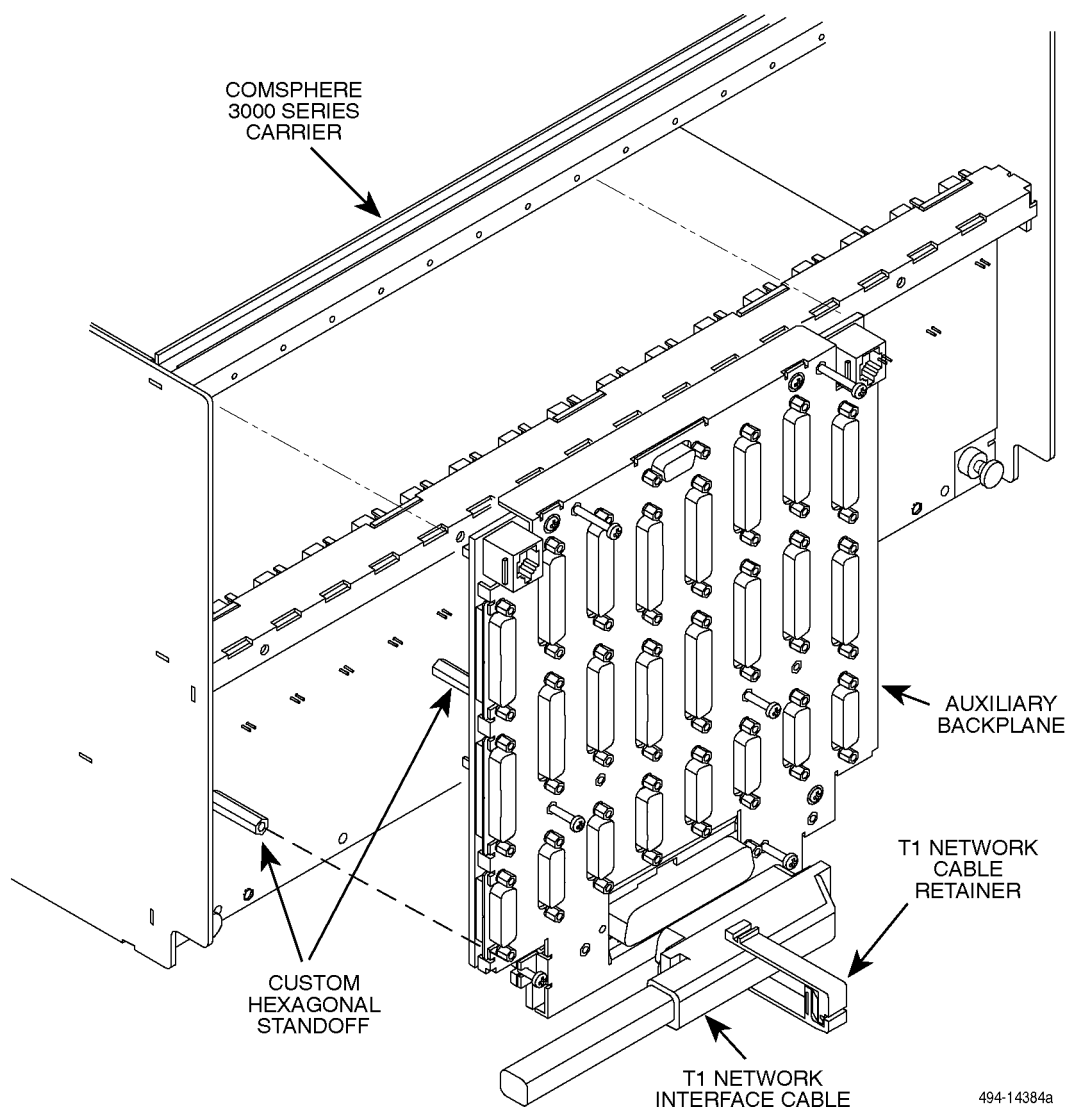
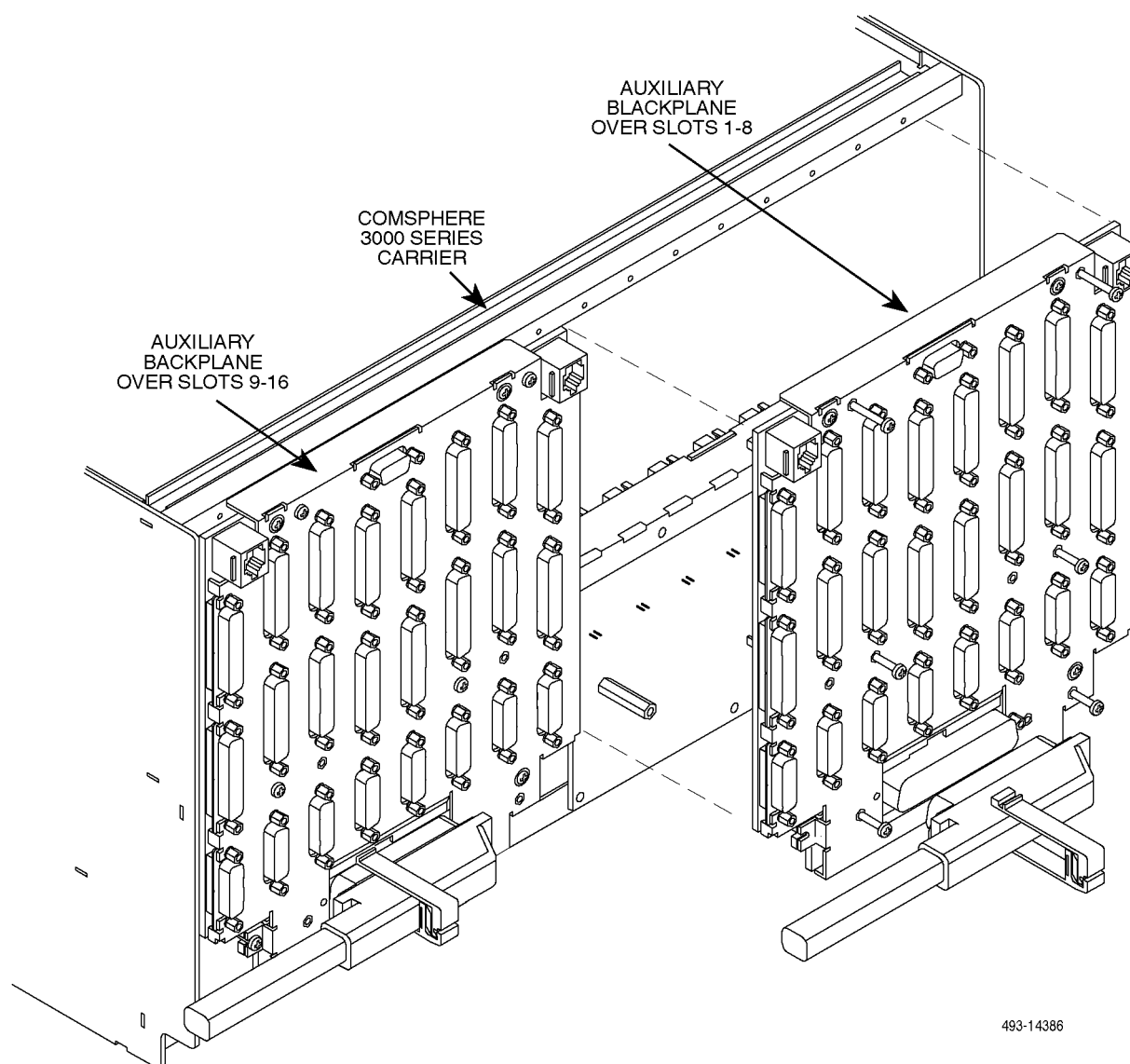


Figure 3-21. Auxiliary Backplane Being Installed over Slots 9–16 of the COMSPHERE 3000 Series Carrier

Figure 3-22 shows one Auxiliary Backplane installed over Slots 9–16 and another being installed over Slots 1–8 of the COMSPHERE 3000 Series Carrier. When you install two auxiliary backplanes on a carrier, you must use a diagnostic channel extension cable to connect them together. For more information about this cable, refer to Appendix B, *Models 3151/3161 Interface Connections*.

NOTE

Once installed, the Auxiliary Backplane extends down into the Network Interface Module (NIM) area of the 3000 Series Carrier. The extension of the backplane displaces a NIM card in that part of the carrier and prohibits the use of dial modems in any slot covered by the Auxiliary Backplane assembly.



493-14386

Figure 3-22. COMSPHERE 3000 Series Carrier with Two Auxiliary Backplanes

You need a Phillips screwdriver to install the Auxiliary Backplane. Long-nose pliers, a 1/4" nut driver, and a 5/16" nut driver are also required.

WARNING

Turn off the power to the 3000 Series Carrier before you install the Auxiliary Backplane.

To install the Auxiliary Backplane (Figure 3-24):

Procedure

1. Remove the power transformer unit from the front of the 3000 Series Carrier.
2. Remove the NIM, if present, from the back of the 3000 Series Carrier.
3. If the carrier is already installed in a cabinet with equipment located below, place a cardboard or paper pad from the front perpendicular to the main backplane at the bottom of the carrier to catch any hardware that may fall below.
4. Use a 1/4" nut driver to remove the two metal hexagonal standoffs on either side of connectors P23 and P24, if mounting the Auxiliary Backplane on the right side, or P25 and P26 if mounting the backplane on the left. Refer to Figure 3-7.
5. Insert the custom hexagonal standoffs into the existing standoff holes from the rear, then use the long-nose pliers and a 5/16" nut driver to install the nylon insulating washers and No. 5 nuts from the front of the carrier.
6. Tighten the nuts with the 5/16" and 1/4" nut drivers.
7. Determine which screw holes you need to use to mount the Auxiliary Backplane using the six screws provided.

The backplane has pointer symbols next to the center and bottom rows of screw holes (refer to the Figure 3-24). If you are mounting the backplane on the right side of the rear of the carrier, use the two screw holes with the pointers facing to the right. If mounting the backplane on the left side, use the holes with the pointers facing left.

For the top row, use the same screw holes for mounting on either side.

8. Align the backplane using the custom standoffs at the bottom and the corresponding holes on the bottom row of the backplane.
9. Insert and finger-tighten the two bottom row screws (3/4" length). If you are mounting the backplane on the left side, you must insert the small 3/8" screw into the open slot at the lower left side of the backplane.
10. Insert and finger-tighten the two top row screws (1" length).
11. Insert and finger-tighten the two center row screws (1" length).
12. Using a screwdriver, tighten all the screws. Be careful not to use excessive force.
13. Ensure that the rubber pad is properly attached to the black plastic T1 network cable retainer (Figure 3-23).

This plastic cable retainer secures the T1 connecting cable once it is plugged in.

NOTE

Do not install the cable retainer if you will be installing a Telco connector cable with a straight cable entry. Instead, secure this cable using the screw lock provided on each side of the T1 network connector.

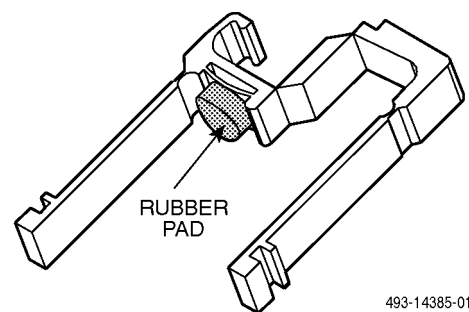


Figure 3-23. T1 Network Cable Retainer

14. Install the T1 network cable retainer. To do so, insert one slotted leg, with the grooved slot facing outward, into the larger recessed slot at the bottom of the T1 connector, then slide it toward the center. Refer to Figures 3-21 and 3-24.
15. Insert the other leg of the cable retainer (with the groove on top) into the larger recessed slot, then slide it toward the left.

To open the cable retainer, insert a flathead screwdriver into the slot on the top and pry it open. The retainer unfolds, allowing connection of the cable. To lock the retainer in place, refold it and snap it down over the top of the connector cable.

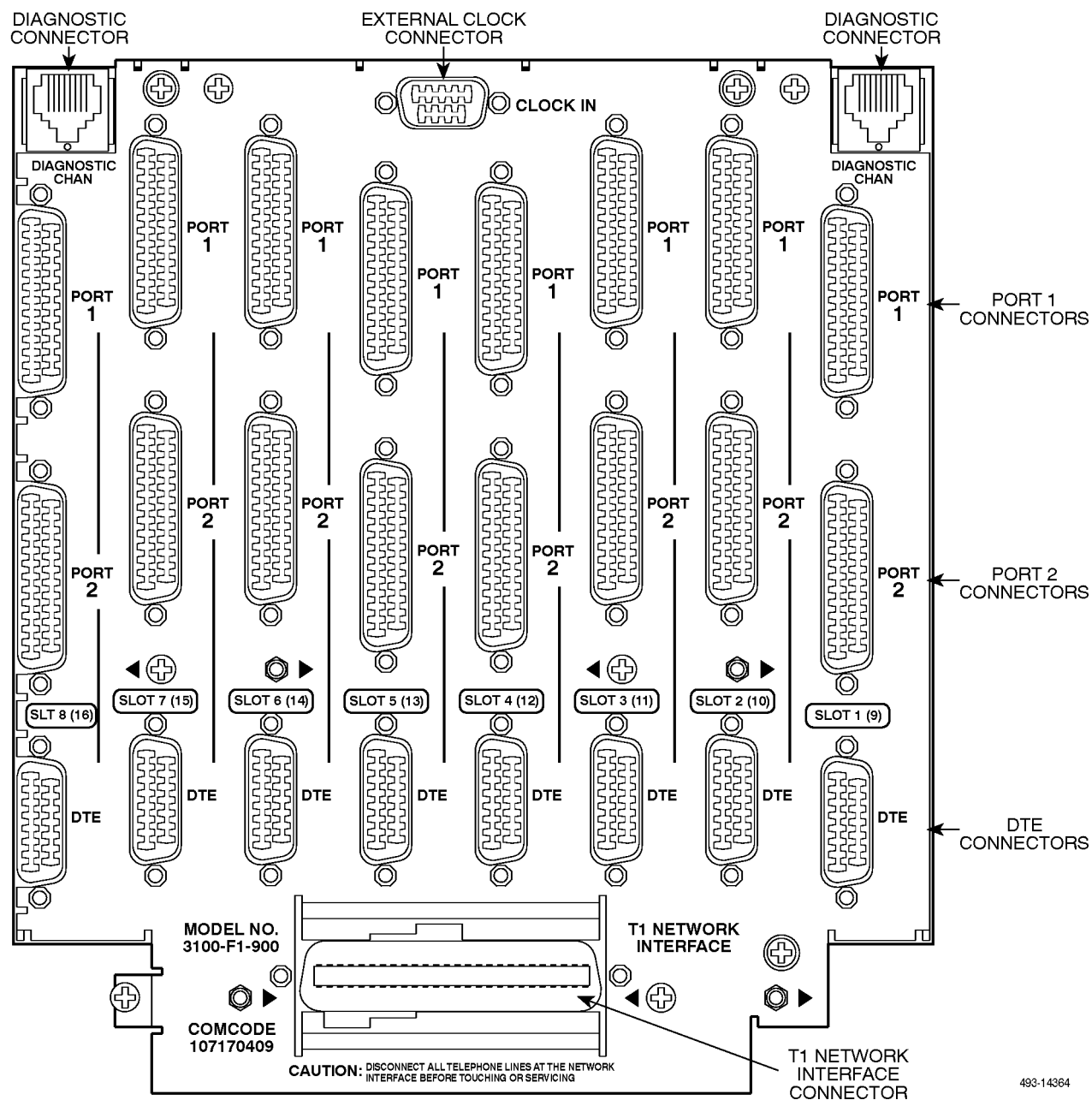


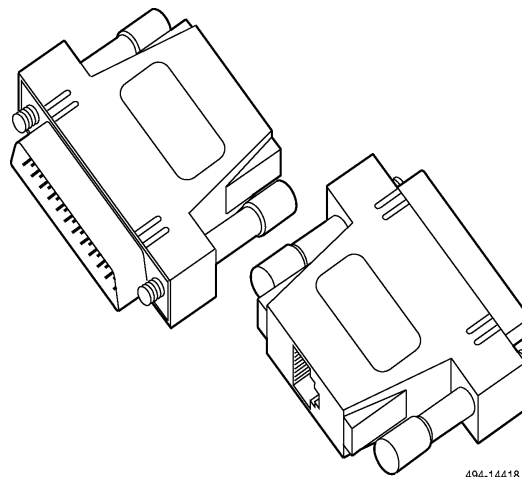
Figure 3-24. Auxiliary Backplane

COM Port Connection – External PC

Communication between the Model 3151 CSUs and Model 3161 DSU/CSUs in a 3000 Series Carrier and an external PC (attached either locally or through an external modem) occurs through a shared communication (COM) port. Since the Models 3151 and 3161 do not have their own COM port for external access, one unit in the carrier must be selected as the master communication port. This unit then provides the COM port for all Models 3151 and 3161 in the carrier.

Only one Model 3151 or 3161 unit in the carrier can be configured as the master communication unit. By using COM port configuration options for this unit, you can configure Port 2 on the Auxiliary Backplane as the COM port for the carrier. An attached PC can then access any unit in that carrier through the shared COM port on the master communication unit.

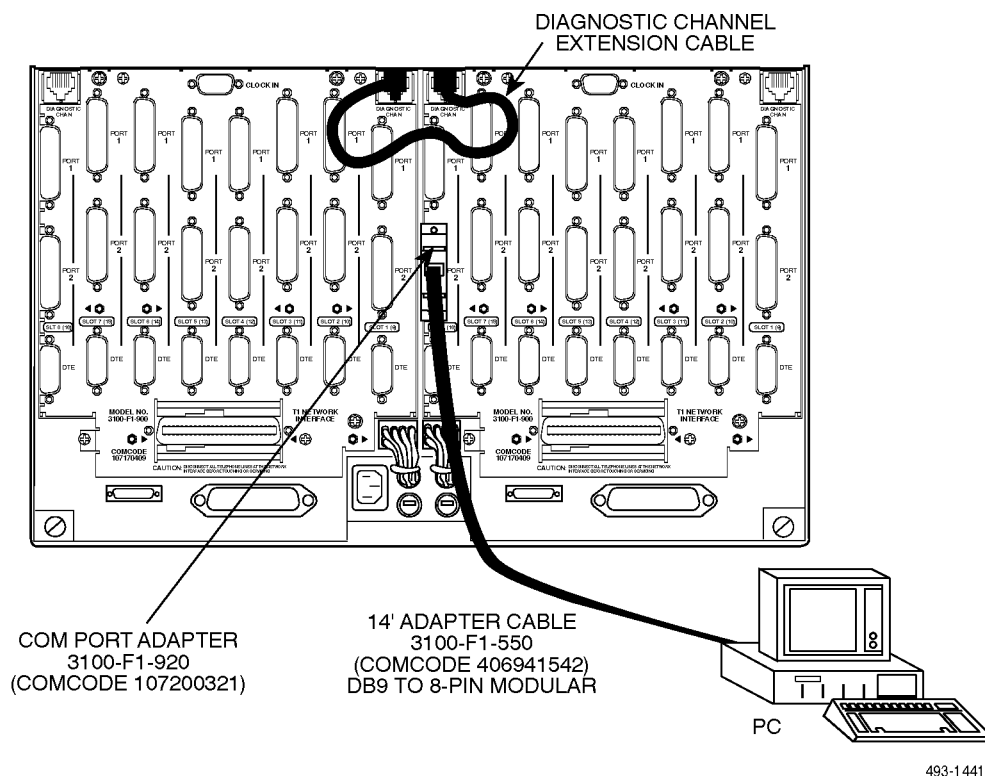
Figure 3-25 shows the COM port adapter you use on the Auxiliary Backplane to accomplish the COM port connection for the master communication unit.



494-14418

Figure 3-25. COM Port Adapter

Figure 3-26 shows a PC attached to the Auxiliary Backplane using the COM port adapter and cable.



493-14417

Figure 3-26. PC Attached to Auxiliary Backplane Using COM Port Adapter and Cable

Network Interface Installation

Once the power transformer (and optional fan module and/or SDCP) has been installed, go to the rear of the cabinet to install the two 50-pin digital network or leased-line interface connectors (see Figure 3-27), labeled Network Cable for Slots 1–8 (P21) and Network Cable for Slots 9–16 (P22). These connectors provide the interface from the DSU or dial/lease modem in the carrier to the DDS (Digital Data Service), LADS (Local Area Data Set), analog leased-line networks, or switched 56 kbps digital service.

Located above the digital or leased network interface connections are the connections used to install the interfaces for dial backup devices and dial/lease modems. In Figure 3-27, these connections are labeled P23 and P24 for Slots 1–8, and P25 and P26 for Slots 9–16. (These slots are covered when Auxiliary Backplanes are installed.) Network Interface Modules (NIMs) are installed onto these connections to provide the interface to the dial network, or switched 56 kbps digital service.

Two modules can be mounted onto the carrier and can be different types of NIMs, independent of one another. Each NIM serves eight contiguous slots in the carrier: one for Slots 1–8 and one for Slots 9–16. Each module determines the operating characteristics of the interfaces to the eight slots it serves.

COMSPHERE 3000 Series Carriers can be populated by the same devices (all T1 CSUs, all T1 DSU/CSUs, all DSUs, or all dial/lease modems), split within the carrier (all dial/lease modems in Slots 1–8 and all DSUs in Slots 9–16), or mixed within the same half of the carrier (e.g., five dial/lease modems and three DSUs).

NOTE

You can only install Model 3151 CSUs and Model 3161 DSU/CSUs on the side of the carrier that has an Auxiliary Backplane installed.

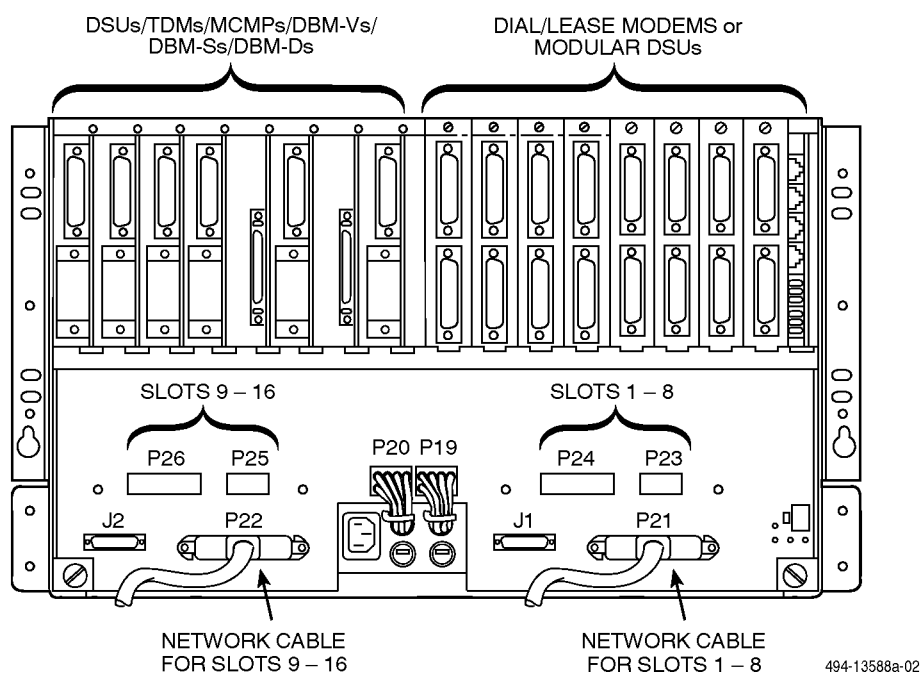


Figure 3-27. Network Interface Cable Installation

Make sure that all devices installed in each half of the carrier are configured with compatible digital/leased-line, dial/dial backup, or switched 56 kbps backup interfaces. All devices installed in a particular carrier half must be capable of interfacing to the leased-line network, dial network, or switched 56 kbps digital service using the common interface connections on the rear of the carrier (see Figure 3-27). The digital/leased-line interface is provided through a 50-pin connector, while the dial/dial backup and switched 56 kbps backup interfaces are provided through Network Interface Modules (NIMs). The dial/dial backup interface NIMs are available with either Permissive or Programmable mode. The switched 56 kbps backup interface is provided through one of the Switched 56 NIMs, either the 2-wire or 4-wire version. A NIM must be selected for half a carrier if any devices in that half of the carrier use the dial backup or switched 56 kbps backup interface. The NIM selected defines the pinouts of the dial or switched 56 kbps connection for all devices within that half of the carrier.

When devices are mixed, it is recommended that they be clustered together, and that dial/lease modems be installed from the left, starting with Slot 1.

- When dial/lease modems are mixed with DSUs in the same half of the carrier (i.e., Slots 1–8 or Slots 9–16), the dial/lease modem's leased-line connection may not occur on the proper pins; therefore, cross-connection may be required at the network interface.
- When populating the same half of the carrier with all DSUs with dial or 2-wire switched 56 backup

capability, the DBM network interface module (NIM) is used. When populating it with all dial/lease modems or a combination of DSUs with dial backup capability and dial/lease modems, the DDD NIM must be used. Both NIMs are available in permissive or programmable versions. In addition, when populating it with all DSUs with 4-wire switched 56 kbps backup capability, the 4-wire Switched 56 NIM must be used.

The remainder of this section provides the following information:

- Digital or analog leased-line network interfaces
- Dial network interface
- Switched 56 kbps network interface
- COMSPHERE 3811 control interface

A number of possible interconnection schemes are available from the network interface connections to the network interface.

Figure 3-28 illustrates the cabling connections for a dial/lease modem, such as the Model 3811 or 3911.

Figure 3-29 illustrates the cabling connections for a DSU or a DSU with a V.32 or 2-wire Switched 56 DBM.

Figure 3-30 illustrates the cabling connections for a DSU with a 4-wire Switched 56 DBM.

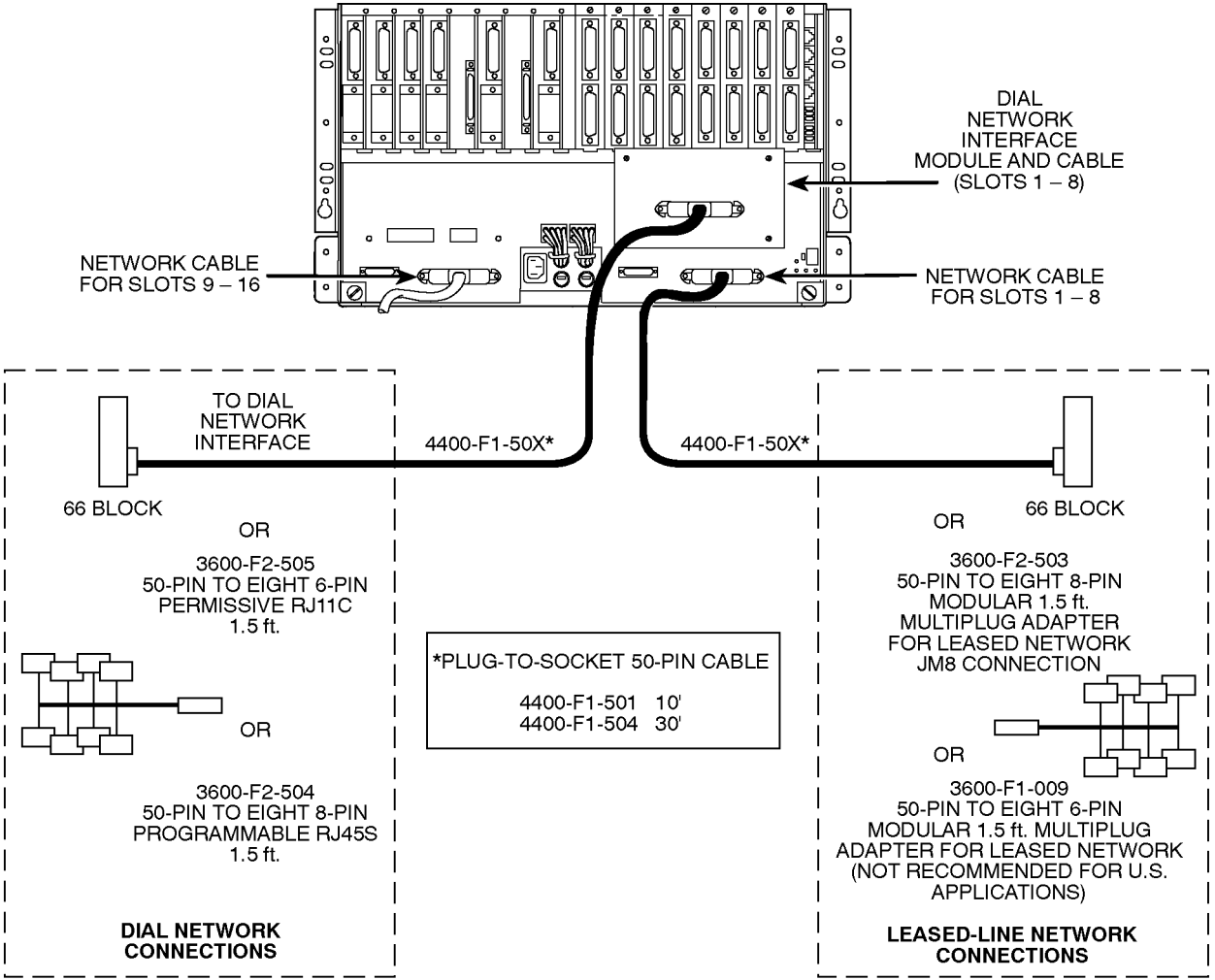


Figure 3-28. Dial/Lease Modem Interconnection Schemes

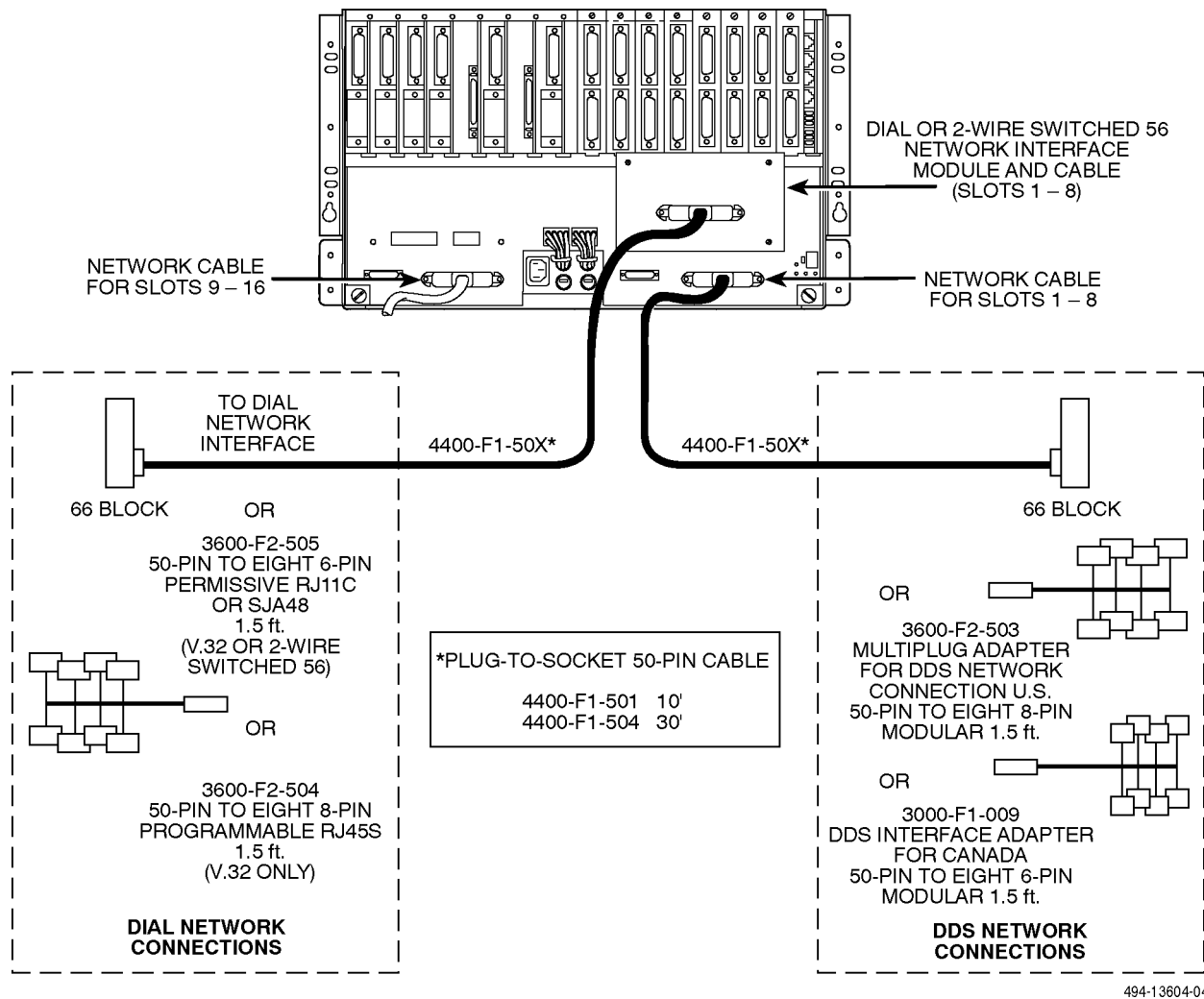


Figure 3-29. DSU, DBM, or DSU with V.32 or 2-Wire Switched 56 DBM Interconnection Schemes

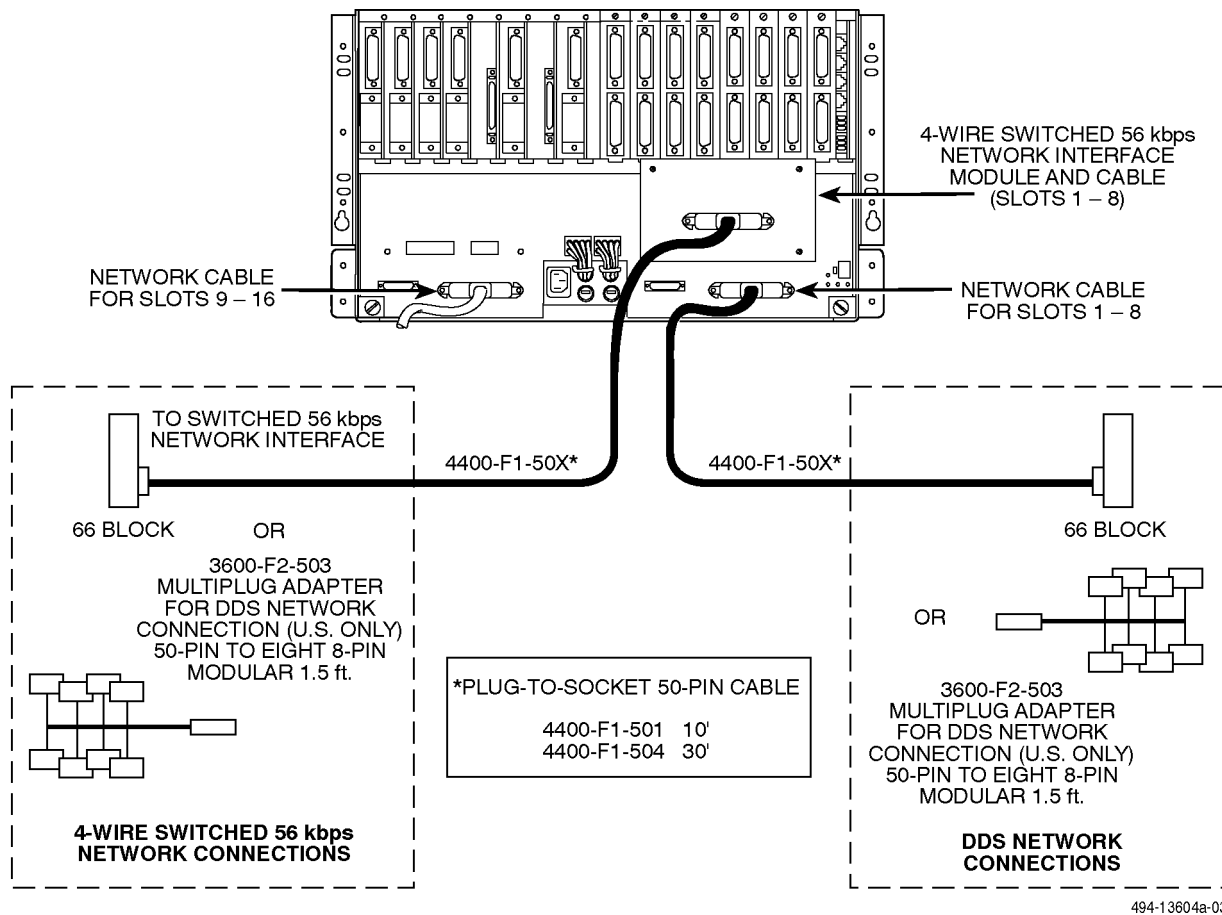


Figure 3-30. DSU with 4-Wire Switched 56 DBM Interconnection Schemes

Digital or Analog Leased-Line Network Interfaces

The digital or analog leased-line network interface is provided by two 50-pin connectors (P21 and P22) on the back of the carrier. Each connector serves eight contiguous slots in the carrier: one for Slots 1–8 and one for Slots 9–16.

Depending upon your configuration, use one of the following schemes for the digital/analog leased-line interfaces (Figure 3-29):

- The 50-pin cable can be attached to a 66A-punchdown block. With this scheme, the circuits must be hard-wired to the block.
- The DDS provider installs the RJ48T-type network interface that the 50-pin cable is plugged into. The RJ48T is specified to allow from 1 to 12 DDS circuits to be placed on a single 50-pin connector. Be sure to specify to the service provider that only the first eight circuit positions are used in each 50-pin connection at the carrier. Note that you cannot use a leased-line modem in this half of the carrier.
- The 50-pin cable can be plugged into a 3600-F2-503 adapter cable. This adapter cable provides 8 keyed modular connectors using Pins 1, 2, 7, and 8. These connect the DSU to a standard DDS network interface (RJ48S) and also provide the new JM8-style leased-line connection for the leased-line modem. This interconnection scheme allows mixing DSUs and leased-line modems only if the analog leased-line network interface is a JM8.
- The 50-pin cable can be attached to the 3000-F1-009 adapter cable. This is a standard DDS/leased-line connection in parts of Canada. It provides eight 6-pin modular plugs. (This interconnection scheme is not recommended for U.S. application.)

To install the digital network or analog leased-line interfaces:

Procedure

1. Connect the network cables (50-pin mass termination line cable – feature number 3600-F2-503) to the carrier and use the small screwdriver to engage and tighten the screw. For installation in Canada, a special network interface adapter cable is provided (feature number 3000-F1-009). First, connect the cables to the carrier and use the small screwdriver to engage and tighten the screw.
2. Attach a cable tie to the cable near the hood at the carrier's cable-tie attachment point. (If a "straight-in" cable is used, disconnect the cable tie, remove the screw and cable tie mount, and fasten the cable with two screws.)
3. Connect the individual cables with 8-pin modular plugs into the adapter for each DDS line.

Dial Network Interface

The direct distance dialing (DDD) network interface is provided by two optional network interface modules (NIMs) on the back of the carrier (Figure 3-28): an RJ21X (permissive) or an RJ27X (programmable) 50-pin connector. When there are two modules, they can be different types of NIMs independent of one another. Appendix A provides the pin assignments for these connectors.

Additional features available for both programmable and permissive NIMs are Service Line and Make Busy. The Service Line feature permits an extra dial line to be connected to the carrier. NIMs with this feature are identified by two Service Line modular connectors mounted on the NIM. The two Service Line connectors are connected in parallel on the NIM board and can be used in daisy chaining (sharing) a single dial line between the two halves of the carrier (Slots 1 through 8 and Slots 9 through 16) and also between multiple carriers.

Depending upon your configuration, use one of the following interconnection schemes for a dial/dial backup interface (Figure 3-28): the 50-pin cable can be attached to a 66A-punchdown block. With this scheme, all dial circuits must be hard-wired to the block. Note that the connection type is defined by the NIM installed in that half of the carrier.

- The 50-pin cable can be used to connect a permissive DBM NIM to a 3600-F2-505 adapter cable. This arrangement is only used for DSU/DBM devices in the Permissive mode.
- The 50-pin cable can be used to connect a programmable DDD NIM to a 3600-F2-504 adapter cable. This requires that all devices in one half of the carrier be configured as programmable connections to the dial lines.
- The 50-pin cable can be used to connect a programmable DBM NIM to a 3600-F2-504 adapter cable. This arrangement is only used for DSU/DBM devices in the Programmable mode.
- The 50-pin cable can be plugged directly into an RJ21X (permissive) or RJ27X (programmable) dial network interface arrangement provided by the dial service provider. Only the first eight lines are wired in each 50-pin connector.

2-Wire Switched 56 kbps Network Interface

The 2-wire switched 56 kbps digital network interface is provided by an optional 2-wire Switched 56 Network Interface Module (NIM), which has a 50-pin connector, on the back of the carrier. Appendix A provides the pin assignments for this connector.

Depending upon your configuration, use one of the following interconnection schemes available for a 2-wire switched 56 kbps backup interface (Figure 3-29):

- The 50-pin cable from a permissive NIM can be attached to a 66A-punchdown block. With this scheme, the circuits must be hard-wired to the block. Note that the connection type is defined by the NIM installed in that half of the carrier.

- The 50-pin cable from a permissive NIM can be connected to a 3600-F2-505 adapter cable.

NOTE

Do not insert a 2-wire switched 56 kbps plug into an RJ11C jack. This type of jack is intended for analog PSTN devices. Plugging into an RJ11C plug may cause equipment damage and harm to the telephone network.

4-Wire Switched 56 kbps Network Interface

The 4-wire switched 56 kbps digital network interface is provided by an optional 4-wire Switched 56 Network Interface Module (NIM), which has an SJA57-type connector, on the back of the carrier. Appendix A provides the pin assignments for this connector.

Depending upon your configuration, use one of the following interconnection schemes available for a 4-wire switched 56 kbps backup interface (Figure 3-30):

- The 50-pin cable can be attached to a 66A-punchdown block. With this scheme, the circuits must be hard-wired to the block. Note that the connection type is defined by the NIM installed in that half of the carrier.
- The 50-pin cable can be plugged into a 3600-F2-503 adapter cable. This cable provides 8 keyed modular connectors using Pins 1, 2, 7, and 8. These connect the DSU to a standard DDS network interface and also provide the 4-wire switched 56 kbps digital service connection for the DSU/4-wire Switched 56 DBM.

NIM Installation

To install the NIM providing the dial interface for the dial backup devices (DBMs), dial/lease modems, or the switched 56 kbps network interface for either the 2-wire or 4-wire Switched 56 DBM:

Procedure

1. For Slots 1–8, seat the NIM on connectors P23 and P24 on the rear of the carrier (Figure 3-31).
2. Use the four screws provided with the module to secure it to the carrier.
3. Connect a 50-pin mass termination line cable to the module. Secure the cable with the cable tie that is provided.
4. For the dial interface, connect the line side of the cable to the dial circuit terminations assigned to the DBMs and dial/lease modems in carrier Slots 1–8 (Figure 3-32).
5. If any DBMs, DBM-Vs, DBM-Ss, DBM-Ds, or dial/lease modems are to be installed in Slots 9–16, repeat Steps 1 through 4 for a second NIM, seating it on connectors P25 and P26 on the rear of the carrier.

For the switched 56 kbps network interface, connect the line side of the cable to the switched 56 kbps circuit terminations assigned to the Switched 56 DBM in carrier Slots 1–8 (Figure 3-32).

If the NIM is equipped with two 6-position Service Line modular connectors (for use with dial/lease modems), connect the line side of the cable to the proper dial line or NIM modular connector (refer to Figure 3-31). The modular plugs are labeled 1 through 8, and they correspond to the devices in those carrier slot positions. For example, modular plug 1 is wired for the device in Slot 1; for Slots 9 through 16, modular plug 1 is wired for the device in Slot 9.

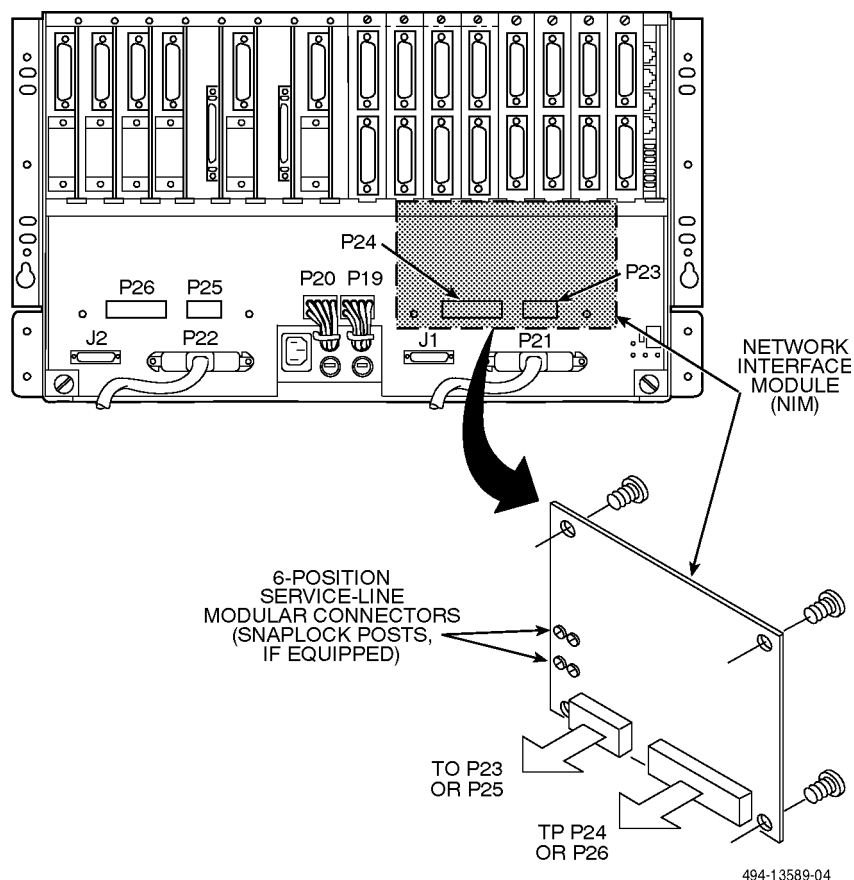


Figure 3-31. Network Interface Module

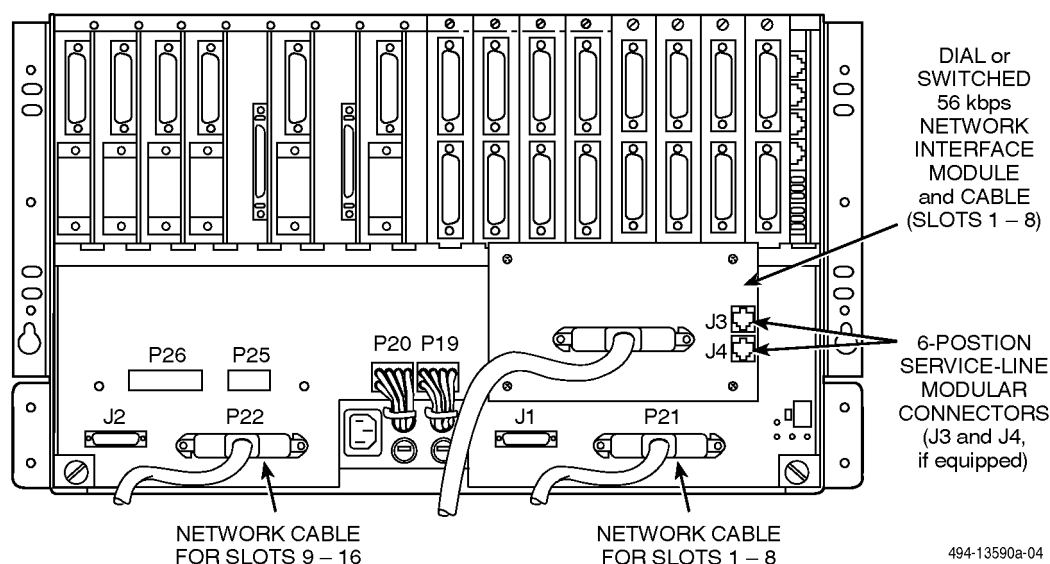


Figure 3-32. Dial Network Interface Module Installation

COMSPHERE 3811 Control Interface

Connectors J1 and J2 provide an interface that can be used to support D-lead or MI/MIC control of the COMSPHERE 3811 modems. These two control signal methods are identical in function in that actuation causes the associated modem to go off-hook in the Originate mode.

With MI/MIC signaling, two leads are provided: Mode Indicate and Mode Indicate Common (usually via Pins 3 and 6 of an 8-position modular VF connector). Actuation of the signal is by momentary connection of these two leads.

With D-lead control signaling, a single signal lead is associated with each modem. Momentary connection of this lead to a common ground actuates the signal.

The interface provided by Connectors J1 and J2 directly support a D-lead interface. (These connectors are defined in Table A-12.) Applications where MI/MIC signaling is provided can be accommodated by simply connecting all MIC leads together and wiring them to Pin 25 (Signal Ground) on the corresponding J1 or J2 connector. Each MI lead can then be treated as a D-lead connection.

Models 3151 and 3161 Network Interface

The Models 3151 and 3161 network interface is provided by one 50-pin connector on the Auxiliary Backplane on the back of the carrier. This connector serves eight contiguous slots in the carrier: either Slots 1–8 or Slots 9–16.

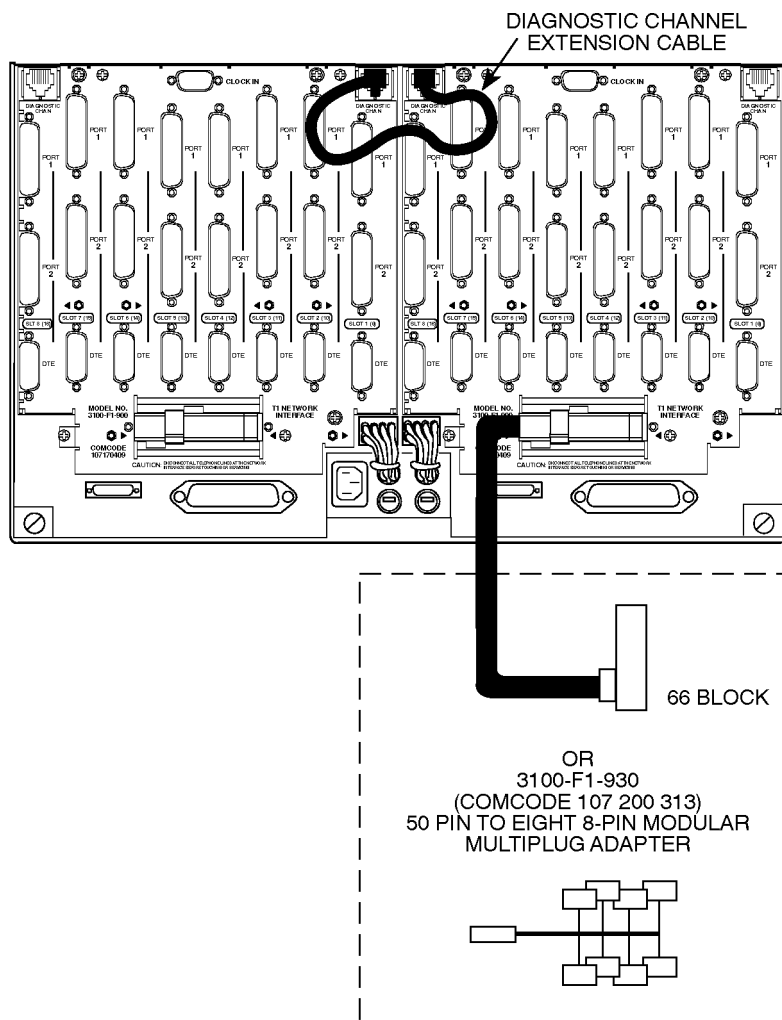
Depending on your configuration, use one of the following schemes for the Models 3151 and 3161 network interface (Figure 3-33).

- The 50-pin cable can be attached to a 66A-punchdown block. With this scheme, the circuits must be hard-wired to the block.
- The 50-pin cable can be plugged into a 3100-F1-930 adapter cable. This adapter cable provides 8 non-keyed modular plugs using Pins 1, 2, 4, and 5. These connect the T1 CSU or T1 DSU/CSU to a standard DDS network interface (RJ48C) and provide the new JM8-style leased-line connection for the T1 interface.

To install the Models 3151 and 3161 network interface:

Procedure

1. Connect the network cable to the carrier.
2. If you are using the Telco connector cable, install the black plastic network cable retainer. If you are using a straight-in connector, use a small screwdriver to engage and tighten the screws.
3. Connect the individual cables with 8-pin modular plugs into the adapter for each T1 line.



493-14396

Figure 3-33. Network Interface for Models 3151 and 3161 Using an Auxiliary Backplane

Circuit Card Installation

The COMSPHERE 3000 Series Carrier is now properly installed and ready to accept modular and/or non-modular T1 CSUs, T1 DSU/CSUs, DSUs, TDMs, MCMPs, DBM-Vs, DBM-Ss, DBM-Ds, and modems.

Non-modular circuit cards are circuit cards with on-board connectors (Figure 3-34). When non-modular circuit cards are installed in the carrier, you must disconnect the DTE cables before removing the circuit cards from the carrier. However, a modular DSU or dial/lease modem circuit card, a circuit card with “gold finger” contacts on the rear edge of the card, can be removed from the carrier without disturbing the DTE cables at the rear of the carrier (Figure 3-34). Rear connector plates that screw onto the rear of the COMSPHERE 3000 Series Carrier are supplied with the modular DSUs and dial/lease modems and provide the DTE interfaces. Rear connector plates can also be ordered separately.

The rear connector plate contains two 25-pin DTE connectors, a 25-pin EIA-232-D/V.24 connector and a 25-pin CCITT V.35 connector, which is shipped with a modular DSU V.35 interconnect cable (feature number 3000-F1-510). This version is supplied with the dial/lease modem, as well. If you intend to use the V.35 interface, you must use the cable provided to convert the 25-pin V.35 interface to the standard 34-pin V.35 interface.

Modular DSUs and TDM or MCMP circuit cards, hereafter referred to as modular DSU-TDM or DSU-MCMP circuit cards, can also be removed from the carrier without disconnecting the DTE cables from the rear of the carrier (Figure 3-35). Connector modules that screw onto the rear of the COMSPHERE 3000 Series Carrier are supplied with the modular DSU-TDM or DSU-MCMP, and provide the DTE interfaces (Figure 3-35).

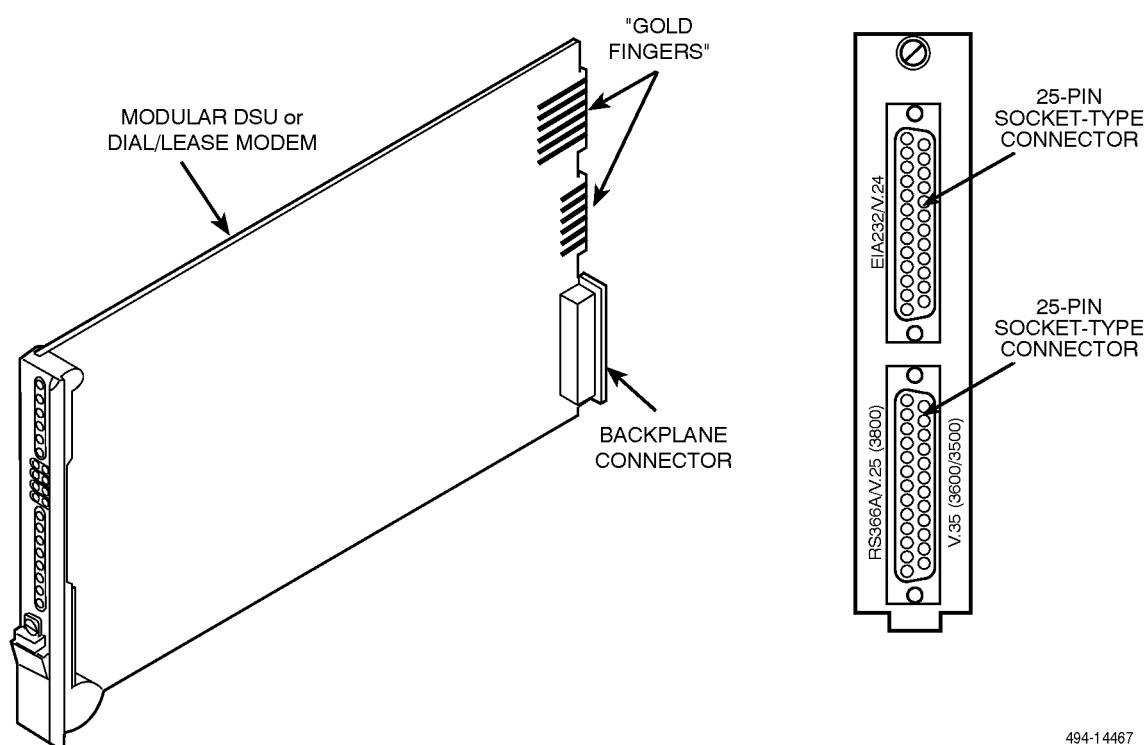


Figure 3-34. Modular DSU or Dial/Lease Modem, and Rear Connector Plate

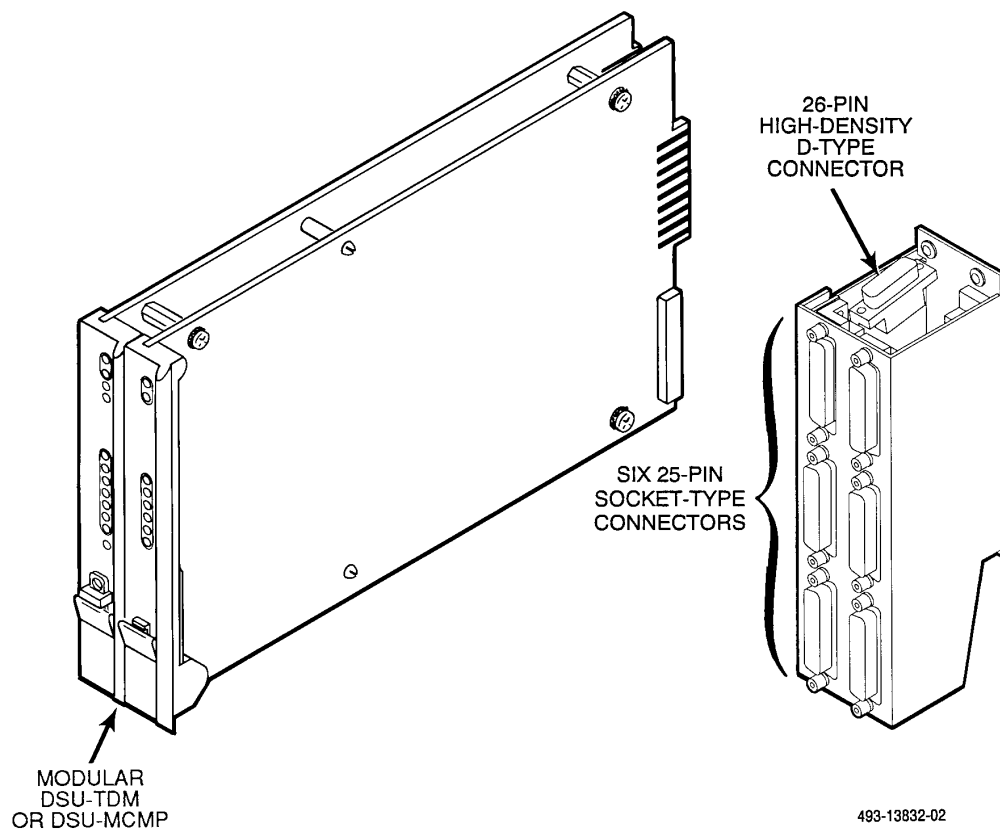


Figure 3-35. Modular DSU-TDM or DSU-MCMP and Connector Module

Connector modules have six ports (labeled Port 1 through Port 6). Each port is a 25-pin connector which provides the EIA-232 DTE interface. In addition, a 26-pin high-density D-type connector is located at the top of the connector module and provides the V.35 interface for either Port 1 or an aggregate data path. This connector requires a 6-port V.35 interconnect cable (supplied by the customer), which converts the 26-pin high-density D-type interface to the standard 34-pin V.35 interface. Connector modules allow removal of a modular DSU-TDM or DSU-MCMP circuit card without disconnecting the DTE cables.

When non-modular DSUs are installed in the same carrier with non-modular dial/lease modems, group dial/lease modems together and install them starting from the left (in Slot 1) before installing the DSUs. However, if modular circuit cards are installed in the same carrier as non-modular circuit cards, the modular circuit cards must be installed to the left of all other devices in the carrier.

Before you install Model 3151 CSUs or Model 3161 DSU/CSUs in a carrier, you must first install an Auxiliary Backplane, as described in the *Auxiliary Backplane Installation* section earlier in this chapter. Figure 3-36 shows the Models 3151 and 3161 circuit cards.

The next five sections contain the following information:

- Preinstallation information.
- Procedure for installing modular circuit cards and DTE connectors (rear connector plates and connector modules).
- Procedure for installing non-modular circuit cards.
- Procedure for installing 3151 and 3161 circuit cards.
- Procedure for installing filler panels.

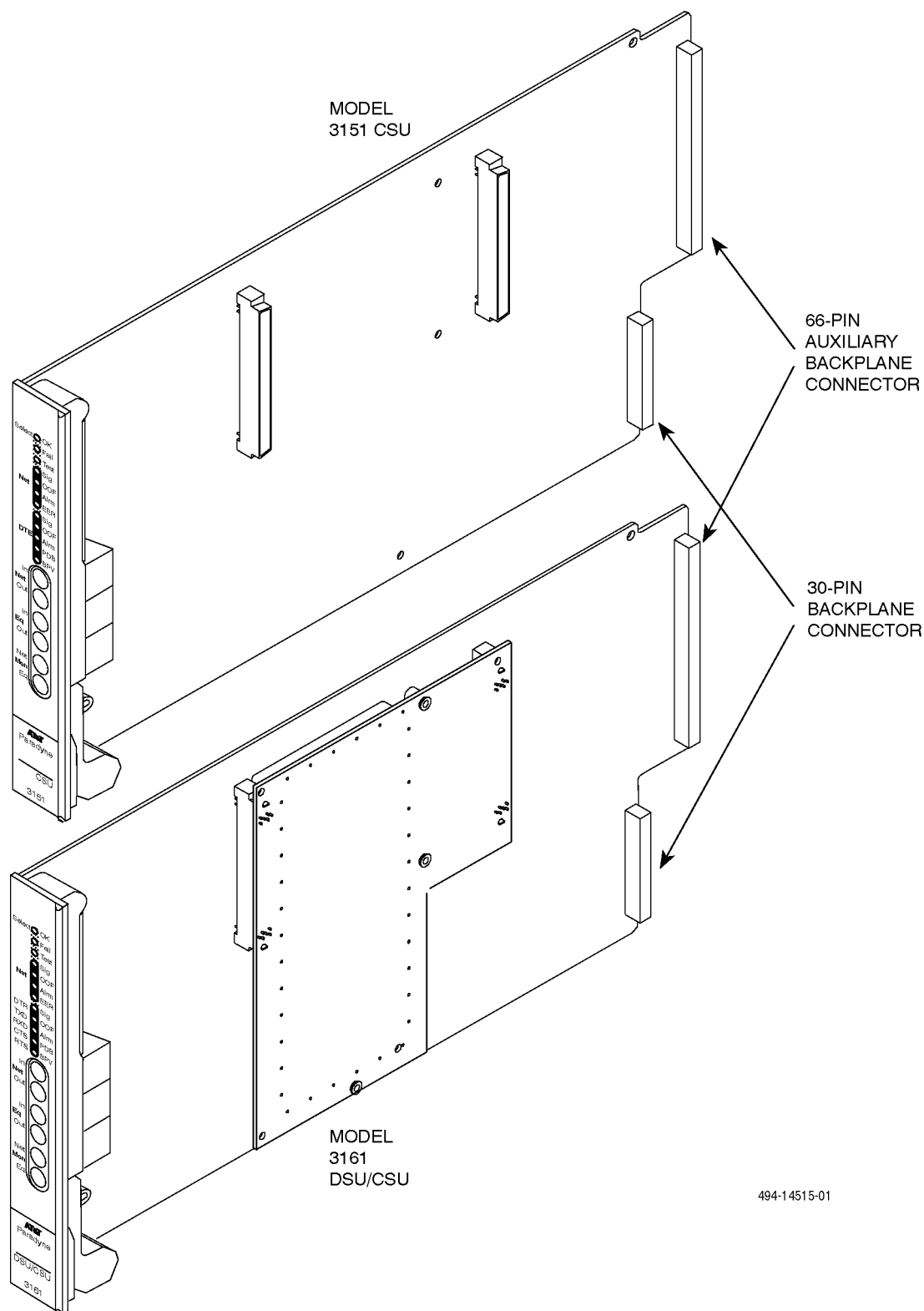


Figure 3-36. Model 3151 and 3161 Circuit Cards

The procedures are only for installing the modular and non-modular DSU-TDM or DSU-MCMP circuit cards that are physically attached. For information on adding the TDM or MCMP option onto a modular or non-modular DSU, see the *COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, Applications Guide*.

Preinstallation Inspection

Check the circuit card for physical damage. If you are installing a modular circuit card, also check the rear connector plate or connector module for damage. Ensure that the connector pins are not damaged. If the circuit card, rear connector plate, V.35 interconnect cable, or connector module shows signs of damage, report it immediately to your shipping representative and also to your AT&T Paradyne representative.

Modular Circuit Card Installation

Before you begin the modular circuit card installation procedure, you must install the Network Interface Modules (NIMs), if required. For information on how to install a NIM, see the *Network Interface Installation* section earlier in this chapter.

NOTE

When a TDM or MCMP is installed, there are two circuit cards with two faceplates that are physically attached. The modular DSU-TDM or DSU-MCMP circuit cards occupy two slot positions in the carrier, but they are installed as one. Follow the instructions, keeping in mind that there are two latches and that a 6-port connector module is used instead of a 2-port rear connector plate.

Also, when installing a TDM or MCMP, make sure both modular circuit cards are aligned in their slots before sliding the cards into place.

If installing a DDD NIM and a modular DSU-TDM or DSU-MCMP circuit card, do not install the connector module where it will interfere with the NIM's J3 and J4 modular connectors.

To install a modular circuit card, proceed as follows, referring to the appropriate *Installation and Operation* or *Applications Guide* when necessary:

Procedure

1. At the rear of the carrier, set the tab on the rear connector plate into the slotted groove on the carrier's backplane. *If you are installing a connector module, there are two tabs instead of one.* Make sure the connector plate uses the same slot position intended for the modular circuit card.
2. Loosely fasten the screw attached to the rear connector plate, allowing for slight adjustment that may be needed when installing the modular circuit card. **If you are installing a connector module, there are two screws (which must be alternately fastened) instead of one.**
3. Change any default hardware strap settings that may be required before installing the modular circuit card in the carrier. For example, straps that determine:
 - Permissive (default) or programmable DDD interface switch.
 - Enabled (default) or disabled test mode indication jumper.
4. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock and rotate the lock to the open position (refer to Figure 3-16). Open the latch.
5. At the front of the carrier, hold the modular circuit card vertically with the latch on its faceplate in the open position. Then, insert the circuit card into the top and bottom circuit card guides (Figure 3-37).

Slide the modular circuit card into the slot, aligning the circuit card with the rear connector plate, until the connectors seat firmly into the back of the carrier. *Remember, if you are installing a TDM or MCMP, there are two modular circuit cards and a connector module instead of one modular circuit card and a rear connector plate.* Press the faceplate latch to secure the circuit card into the rear connector plate, rotate the circuit pack lock into the closed position (refer to Figure 3-16), and tighten the screw.

If the carrier's power transformer unit is operating, the unit performs a self-test routine. After several seconds, the modular circuit card completes its power-up self-test in which all faceplate LEDs light. If the circuit card fails the self-test, the **Alarm** LED on the faceplate flashes.

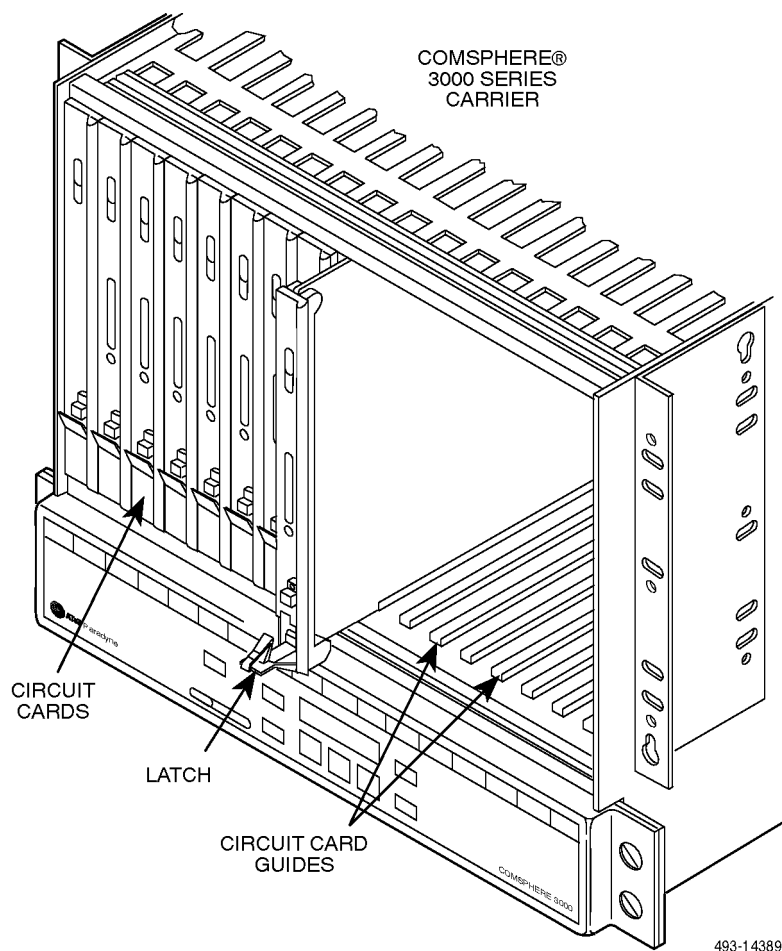


Figure 3-37. Circuit Card Installation

NOTE

The following step (Step 6) is only required during initial installation of the modular circuit card. This step ensures proper alignment of the circuit card(s) and rear connector plate or connector module.

All subsequent installation and removal of modular circuit cards are performed from the front of the carrier.

6. Return to the rear of the carrier and tighten the rear connector plate screw. *If you are installing a connector module, there are two screws instead of one.*
7. Connect cabling, install ferrite chokes if supplied (Figure 3-38), configure the unit, and perform verification testing as described in the appropriate *Installation and Operation* or *Applications Guide*.

If you are using a carrier assembly with an ac power transformer unit, you must install the ferrite choke supplied with the carrier assembly onto your ac power cable.

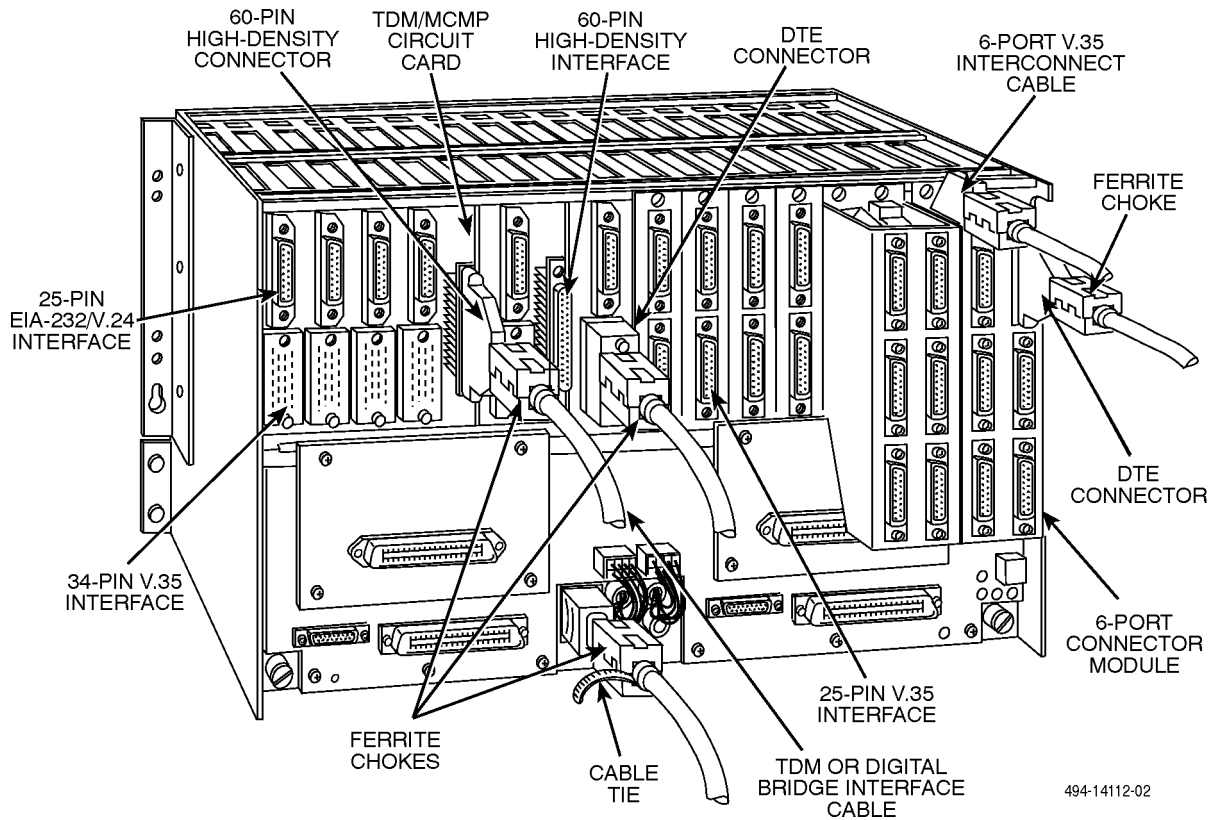


Figure 3-38. Cabling and Ferrite Chokes

To install the ferrite choke, refer to Figure 3-38:



Procedure

1. Open the ferrite choke and place it around the ac power cable as close to the cable connector as possible.
2. Close the two halves around the cable and snap the choke shut, pressing down on the plastic latch to secure it in place.
3. Secure the ferrite choke in place with the cable tie that is supplied.

Non-Modular Circuit Card Installation

To install each circuit card, proceed as follows, referring to the appropriate *Installation and Operation Manual* or *Applications Guide* when necessary:



Procedure

1. Change any default hardware strap settings that may be required before installing the circuit card in the carrier.
2. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock and rotate the lock to the open position (refer to Figure 3-16). Open the latch.

3. At the front of the carrier, hold the circuit card vertically, with the latch on its faceplate in the open position (Figure 3-37). Insert it into the top and bottom card guides of one of the slots numbered 1 through 16.

Slide the card into the slot until the power and network connector seats firmly in the mating connector on the backplane.

4. Press the latch to secure the circuit card in the carrier, rotate the circuit pack lock back into the closed position (refer to Figure 3-16) and tighten the screw.

The carrier's power transformer unit performs a self-test routine. If the power transformer unit passes the self-test routine, all indicators on the faceplate light briefly.

If the LEDs on the circuit card do not light after being installed in the carrier, there may be a failure in the circuit card or in the carrier's power supply. Install the DSU or dial/lease modem in another working carrier. If it works, or if a second DSU or dial/lease modem installed in another slot in the same carrier also does not light, check that the power cable is properly attached and that the ac outlet is active. If the power cable is properly attached, the ac outlet is active, and the DSUs or dial/lease modems still do not light up, check the fuses on the power transformer unit (refer to Figure 3-7). If the fuses are blown, replace the fuses and determine the cause of the overload. If the fuses are okay, replace the power transformer unit.

5. Connect cabling, install ferrite chokes (Figure 3-36), configure the unit, and perform verification testing as described in the appropriate *Installation and Operation Manual* or *Applications Guide*.

To install the TDM (and MCMP) and digital bridge interface cables:

- a. Connect the 60-pin high-density interface cable connector to the back of the installed TDM or MCMP circuit card. The mating connectors clip securely into place and cannot be pulled free without squeezing the connector clips together to release the cable.
- b. Select the connector labeled Port 2, plug it into the DTE that will communicate with the TDM or MCMP circuit card over Port 2, and use the small screwdriver to engage and tighten the screws on either side of the connector. Select the connector labeled Port 3 and attach it to the appropriate DTE as described for Port 2, and so on, until all five connectors are attached to DTEs.

If you are using a carrier assembly with an ac power transformer unit, you must install the ferrite choke supplied with the carrier assembly onto your ac power cable. See Step 7 of the Modular Circuit Card Installation section earlier in this chapter for instructions.

Models 3151 and 3161 Circuit Card Installation

NOTE

Before you install a 3151 CSU or 3161 DSU/CSU circuit card in a carrier, you must first install an Auxiliary Backplane.

To install a 3151 CSU or 3161 DSU/CSU circuit card in the 3000 Series Carrier, with or without the –48 Vdc Central Office Power Unit, use the following procedure.

Procedure

1. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock, rotate the lock to the open position, and open the latch (refer to Figure 3-16).
2. At the front of the carrier, hold the circuit card vertically, with the latch on its faceplate in the open position. Insert the card into the top and bottom card guides of one of the slots numbered 1–16.
3. Slide the card into the slot. The ejector latch lifts up as it engages the metal flange (refer to Figure 3-37).
4. Press the latch up until it clicks into the locked position to secure the circuit card in the carrier, then rotate the circuit pack lock back into the closed position and tighten the screw.

Filler Panels

A filler panel must be ordered and installed for each unfilled slot in the carrier to ensure compliance with safety requirements. This filler panel is a blank faceplate equipped with an abbreviated circuit card, a latch to secure it to the carrier, and a circuit pack lock to prevent it from being removed from the carrier without use of a tool.

To install the filler panel in an empty slot:

Procedure

1. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock and rotate the lock to the open position (refer to Figure 3-16). Open the latch.
2. Hold the filler panel vertically at the front of the carrier, with the faceplate latch in the open position. Insert the blank circuit card into the top and bottom card guides of the empty slot (Figure 3-37), and tighten the screw.

COMSPHERE Interface Connections **A**

Overview	A-1
----------------	-----

Overview

Two 50-pin connectors on the backplane provide an interface between the carrier and the digital/lease network, and one or two optional 50-pin network interface modules provide the interface to the dial network or the switched 56 kbps digital network.

Figure A-1 is a diagram of the 50-pin digital or analog leased-line network interface connector. Figure A-2 shows the 50-pin modular plug conversion cable used for digital and leased-line networks. Figure A-3 illustrates the connectors on the COMSPHERE 3000 Series Carrier backplane.

Table A-1 provides the digital or analog leasedline network interface connector pin assignments. Table A-2 provides the permissive dial network interface module (NIM) pin assignments that are used for dial and 2-wire switched 56 kbps applications, while Table A-3 provides the programmable NIM pin assignments. Table A-4

provides the pin assignments for the 4-wire Switched 56 NIM. Tables A-5 and A-6 provide the pin assignments from the NMS and Shared Diagnostic Control Panel (SDCP). Tables A-7 through A-10 list the pin assignments for all 50-pin to modular plug conversion cables. Table A-11 provides descriptions of the connectors on the carrier's backplane. Table A-12 provides the D-lead control interface pin assignments.

The COMSPHERE 3811/3911 D-lead control interface is used in modem-pooling applications to cause the modem to go off-hook in the Originate mode. This interface is provided on connector J1 for Slots 1 through 8 and connector J2 for Slots 9 through 16. Table A-12 lists the D-lead control interface pin assignments.

Pin assignments vary from one product to another. For information on a specific cable or connector, see the appropriate *Installation and Operation Manual* or *Applications Guide* for the product.

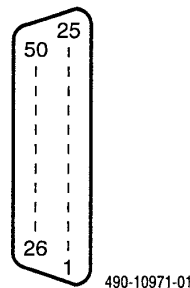


Figure A-1. 50-Pin Cable Connector

Table A-1
Digital or Analog Leased-Line Network Interface

Slot	Pin			
	Receive Circuits		Transmit Circuits	
	T	R	T1	R1
1 or 9	26	1	27	2
2 or 10	28	3	29	4
3 or 11	30	5	31	6
4 or 12	32	7	33	8
5 or 13	34	9	35	10
6 or 14	36	11	37	12
7 or 15	38	13	39	14
8 or 16	40	15	41	16

Table A-2
RJ21X (Permissive) Dial and 2-Wire Switched 56 Network Interface Module

Slot	Pin	
	T	R
1 or 9	26	1
2 or 10	27	2
3 or 11	28	3
4 or 12	29	4
5 or 13	30	5
6 or 14	31	6
7 or 15	32	7
8 or 16	33	8

Table A-3
RJ27X (Programmable) Dial Network Interface Module

Slot	Pin			
	T	R	PR	PC
1 or 9	27	2	28	3
2 or 10	30	5	31	6
3 or 11	33	8	34	9
4 or 12	36	11	37	12
5 or 13	39	14	40	15
6 or 14	42	17	43	18
7 or 15	45	20	46	21
8 or 16	48	23	49	24

Table A-4
SJA57 4-Wire Switched 56 Network Interface Module

Slot	Receive		Transmit	
	T	R	T1	R1
1 or 9	26	1	27	2
2 or 10	28	3	29	4
3 or 11	30	5	31	6
4 or 12	32	7	33	8
5 or 13	34	9	35	10
6 or 14	36	11	37	12
7 or 15	38	13	39	14
8 or 16	40	15	41	16

Table A-5
SDU – NMS Interface

Pin	Circuit		Function
	CC IN	CC OUT	
1	RSI	RSO	Request-to-Send
2	CSO	CSI	Clear-to-Send
3	RDO	RDI	Receive Data
4	SG	SG	Signal Ground
5	SDI	SDO	Transmit Data
6	+Vdc	–	+12 Vdc Output

Table A-6
SDU – Shared Diagnostic Control Panel Interface

Pin	Circuit		Function
	FP IN	FP OUT	
1	Ground	Ground	Ground
4	SG	SG	Signal Ground
5	FPRDO	FPRDI	Received Data
6	FPSDI	FPSDO	Send Data
7	FPAALM	FPAALM	Audible Alarm
8	FPLALMO	FPLALMI	LED Alarm

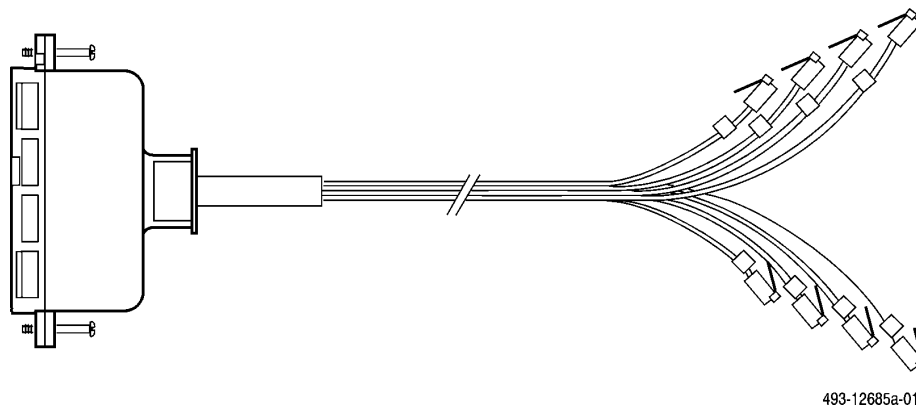


Figure A-2. 50-Pin to Modular Plug Digital/Lease Conversion Cable

Table A-7
Pinout for 3600-F2-503 (Digital and JM8 Leased) Network Interface Cables

50-Position Pin Connector Pin #	Signal Name	Modular Plug #	Modular Pin #
2	R1 (transmit)	1	1 of 8
27	T1 (transmit)	1	2 of 8
26	T (receive)	1	7 of 8
1	R (receive)	1	8 of 8
4	R1 (transmit)	2	1 of 8
29	T1 (transmit)	2	2 of 8
28	T (receive)	2	7 of 8
3	R (receive)	2	8 of 8
6	R1 (transmit)	3	1 of 8
31	T1 (transmit)	3	2 of 8
30	T (receive)	3	7 of 8
5	R (receive)	3	8 of 8
8	R1 (transmit)	4	1 of 8
33	T1 (transmit)	4	2 of 8
32	T (receive)	4	7 of 8
7	R (receive)	4	8 of 8
10	R1 (transmit)	5	1 of 8
35	T1 (transmit)	5	2 of 8
34	T (receive)	5	7 of 8
9	R (receive)	5	8 of 8
12	R1 (transmit)	6	1 of 8
37	T1 (transmit)	6	2 of 8
36	T (receive)	6	7 of 8
11	R (receive)	6	8 of 8
14	R1 (transmit)	7	1 of 8
39	T1 (transmit)	7	2 of 8
38	T (receive)	7	7 of 8
13	R (receive)	7	8 of 8
16	R1 (transmit)	8	1 of 8
41	T1 (transmit)	8	2 of 8
40	T (receive)	8	7 of 8
15	R (receive)	8	8 of 8

Table A-8
Pinout for 3600-F2-504 (Dial Programmable – RJ45S) Network Interface Cable

50-Position Pin Connector Pin #	Signal Name	Modular Plug #	Modular Pin #
2	Ring	1	4 of 8
27	Tip	1	5 of 8
28	PR	1	7 of 8
3	PC	1	8 of 8
5	Ring	2	4 of 8
30	Tip	2	5 of 8
31	PR	2	7 of 8
6	PC	2	8 of 8
8	Ring	3	4 of 8
33	Tip	3	5 of 8
34	PR	3	7 of 8
9	PC	3	8 of 8
11	Ring	4	4 of 8
36	Tip	4	5 of 8
37	PR	4	7 of 8
12	PC	4	8 of 8
14	Ring	5	4 of 8
39	Tip	5	5 of 8
40	PR	5	7 of 8
15	PC	5	8 of 8
17	Ring	6	4 of 8
42	Tip	6	5 of 8
43	PR	6	7 of 8
18	PC	6	8 of 8
20	Ring	7	4 of 8
45	Tip	7	5 of 8
46	PR	7	7 of 8
21	PC	7	8 of 8
23	Ring	8	4 of 8
48	Tip	8	5 of 8
49	PR	8	7 of 8
24	PC	8	8 of 8

Table A-9
Pinout for 3600-F1-505 (Dial Permissive – RJ11C) Network Interface Cable

50-Position Pin Connector Pin #	Signal Name	Modular Plug #	Modular Pin #
1	Ring	1	3 of 6
26	Tip	1	4 of 6
2	Ring	2	3 of 6
27	Tip	2	4 of 6
3	Ring	3	3 of 6
28	Tip	3	4 of 6
4	Ring	4	3 of 6
29	Tip	4	4 of 6
5	Ring	5	3 of 6
30	Tip	5	4 of 6
6	Ring	6	3 of 6
31	Tip	6	4 of 6
7	Ring	7	3 of 6
32	Tip	7	4 of 6
8	Ring	8	3 of 6
33	Tip	8	4 of 6

Table A-10
Pinout for 3000-F1-009 (50-Pin to Eight 6-Pin Modular) Network Interface Cable

50-Position Pin Connector Pin #	Signal Name	Modular Plug #	Modular Pin #
2	Transmit	1	3 of 6
27	Transmit	1	4 of 6
26	Receive	1	2 of 6
1	Receive	1	5 of 6
4	Transmit	2	3 of 6
29	Transmit	2	4 of 6
28	Receive	2	2 of 6
3	Receive	2	5 of 6
6	Transmit	3	3 of 6
31	Transmit	3	4 of 6
30	Receive	3	2 of 6
5	Receive	3	5 of 6
8	Transmit	4	3 of 6
33	Transmit	4	4 of 6
32	Receive	4	2 of 6
7	Receive	4	5 of 6
10	Transmit	5	3 of 6
35	Transmit	5	4 of 6
34	Receive	5	2 of 6
9	Receive	5	5 of 6
12	Transmit	6	3 of 6
37	Transmit	6	4 of 6
36	Receive	6	2 of 6
11	Receive	6	5 of 6
14	Transmit	7	3 of 6
39	Transmit	7	4 of 6
38	Receive	7	2 of 6
13	Receive	7	5 of 6
16	Transmit	8	3 of 6
41	Transmit	8	4 of 6
40	Receive	8	2 of 6
15	Receive	8	5 of 6

Table A-11
Connectors on the COMSPHERE 3000 Series Carrier's Backplane

Connectors	Function
P19, P20	These connectors supply low voltage ac or low voltage dc from the power supply unit onto the COMSPHERE 3000 Series Carrier's backplane.
P21	This 50-pin connector provides the digital or 4-wire and 2-wire leased-line interface for DCEs (DSUs and dial/lease modems) in Slots 1 through 8.
P22	This 50-pin connector provides the digital or 4-wire and 2-wire leased-line interface for DCEs (DSUs and dial/lease modems) in Slots 9 through 16.
P23, P24	These connectors are used by the Network Interface Modules (NIMs) to provide the dial interface through a 50-pin connector for dial/lease modems in Slots 1 through 8.
P25, P26	These connectors are used by the Network Interface Modules (NIMs) to provide the dial interface through a 50-pin connector for dial/lease modems in Slots 9 through 16.
J1	This 26-pin high-density D-type connector provides the D-lead control interface for dial/lease modems in Slots 1 through 8.

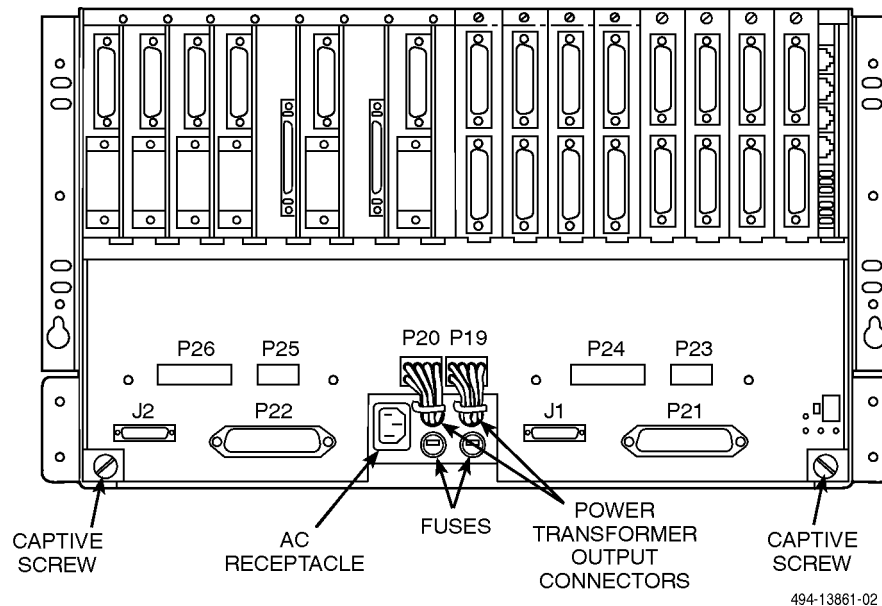


Figure A-3. Connectors on the COMSPHERE 3000 Series Carrier Backplane

Table A-12
(1 of 2)
D-Lead Control Interface

Slot	Connector	Pin Number	Signal Name
1	J1	16 15	DLCTL NC
2	J1	14 1	DLCTL NC
3	J1	2 3	DLCTL NC
4	J1	4 5	DLCTL NC
5	J1	6 7	DLCTL NC
6	J1	8 9	DLCTL NC
7	J1	10 11	DLCTL NC
8	J1	12 13	DLCTL NC
—	J2	25	SIG GND
9	J2	16 15	DLCTL NC
10	J2	14 1	DLCTL NC
11	J2	2 3	DLCTL NC
12	J2	4 5	DLCTL NC
13	J2	6 7	DLCTL NC
14	J2	8 9	DLCTL NC
DLCTL = D-Lead Control SIG GND = Signal Ground NC = No Connection			

Table A-12
(2 of 2)
D-Lead Control Interface

Slot	Connector	Pin Number	Signal Name
15	J2	10 11	DLCTL NC
16	J2	12 13	DLCTL NC
—	J2	25	SIG GND
DLCTL = D-Lead Control SIG GND = Signal Ground NC = No Connection			

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Models 3151/3161 Interface Connections **B**

Overview	B-1
Auxiliary Backplane Connectors	B-1
T1 Network Interface Connector	B-4
DSX-1 Port DTE Interface	B-7
COM Port Interface	B-8
Port Interfaces	B-11
EIA-530A DB25 Port Interface Connector	B-11
RS449 Port Interface Connector	B-12
V.35 Port Interface Connector	B-14
External Clock Connector	B-16
Diagnostic Channel Extension Cable	B-17

Overview

The ACCULINK Model 3151 CSU and Model 3161 DSU/CSU are shipped without cables. Various interconnecting cables are available from AT&T Paradyne. These cables have an AT&T Paradyne feature number assigned to them (see Appendix C, *Equipment List*). Cables that are listed, but have no feature number, must be customer supplied. This appendix describes the cable pin assignments for both AT&T Paradyne cables and customer-supplied cables. You can use this information should you need to build your own cables.

Unless otherwise noted, the interface connections apply to both Models 3151 and 3161.

Auxiliary Backplane Connectors

The Auxiliary Backplane provides the connectors shown in Figure B-1 and described in Table B-1.

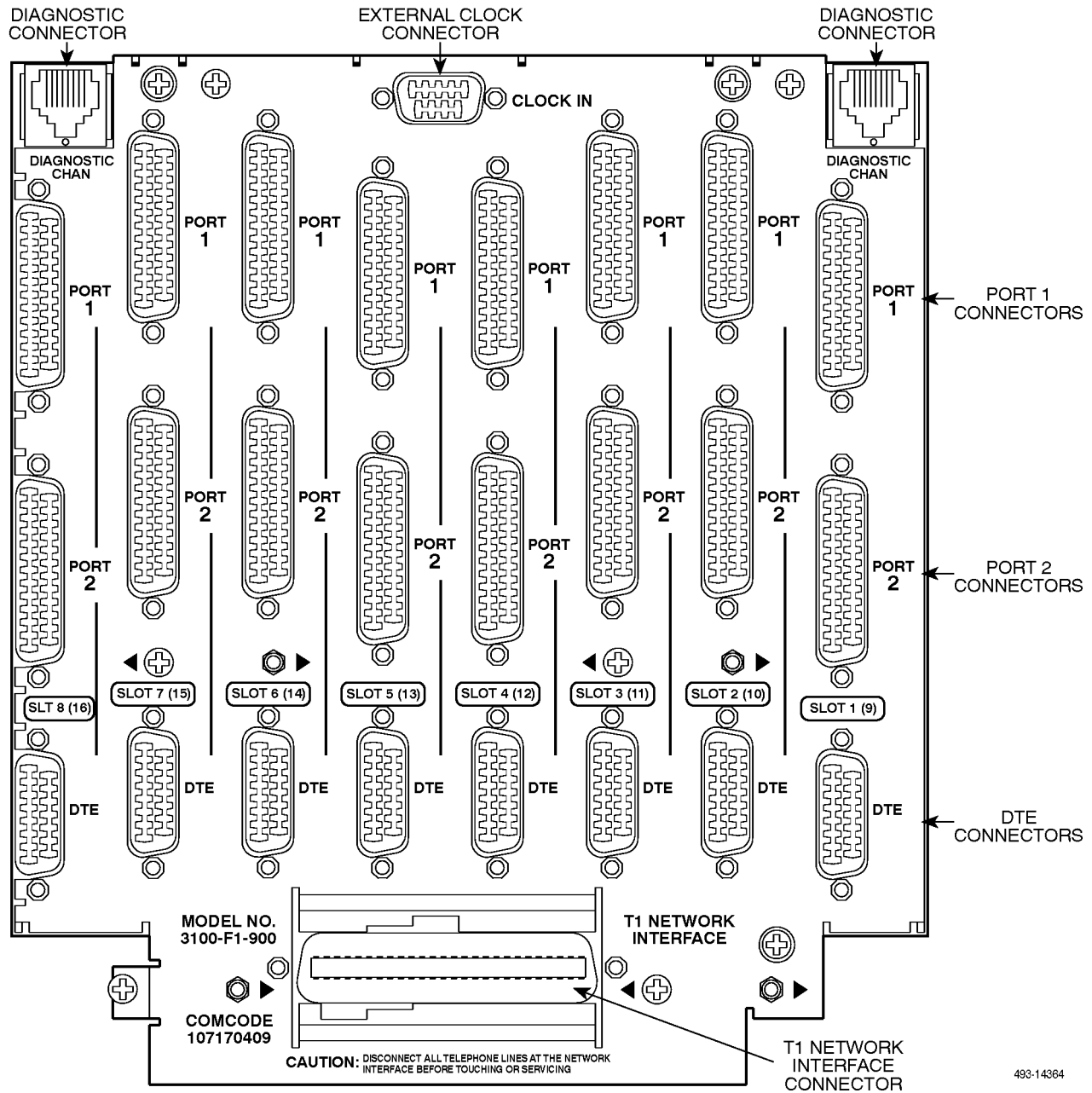


Figure B-1. Auxiliary Backplane Connectors

Table B-1
Auxiliary Backplane Connectors

Connector	Quantity	Model	Use
DTE	8	3151/3161	DB15 socket. Provides the connection to your T1 DSX-1 (DTE).
Network	1	3151/3161	50-pin RJ48H plug. Provides the connection to the T1 network for all eight slots supported by the Auxiliary Backplane.
Clock In	1	3161	DB9 socket. Attaches an external clock. The external clock provides timing for up to eight slots. Each Auxiliary Backplane must have its own external clock input.
Port 1 & 2	16	3151/3161	DB25 (EIA-530A) socket. Provides the connection from a 3161 DSU/CSU to the synchronous data DTE. The Port 2 DB25 socket connector allows one slot in the carrier to be configured as the COM port, which replaces the functionality of the second data port. The COM port is a communications port that provides access to the front panel from a locally connected PC.
Diag	2	3151/3161	8-pin modular jack. Provides diagnostic connectivity between Auxiliary Backplanes in a carrier.

T1 Network Interface Connector

The T1 network interface connector is a 50-pin Telco plug RJ48H connector (see Table B-2).

The T1 line network interface breakout cable is a 2 1/2-foot octopus cable with a 50-pin Telco socket (RJ48H) on one end and eight unkeyed 8-pin modular plugs (RJ48C) on the other end (see Figures B-2 and B-3). The conductors are paired, 24 AWG solid.

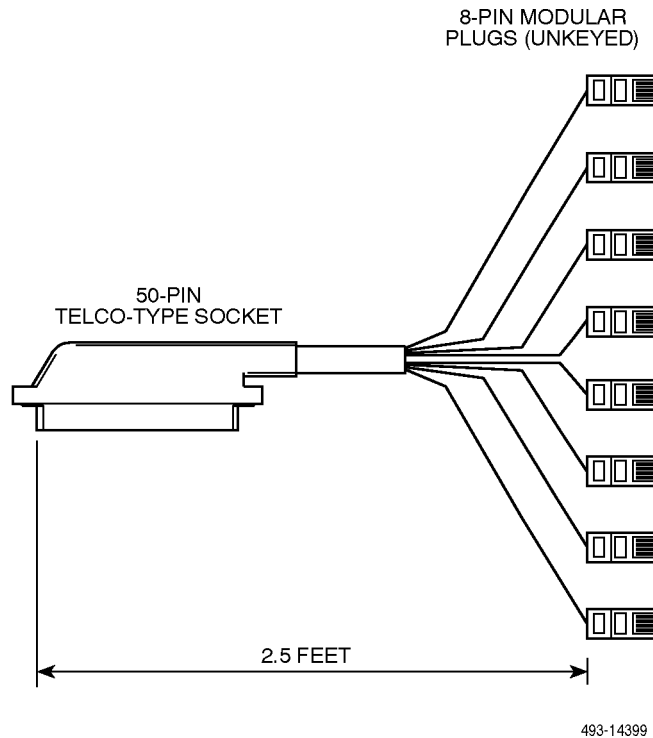


Figure B-2. T1 Line Interface Multiplug Adapter with RJ48C Connector (Feature Number 3100-F1-930)

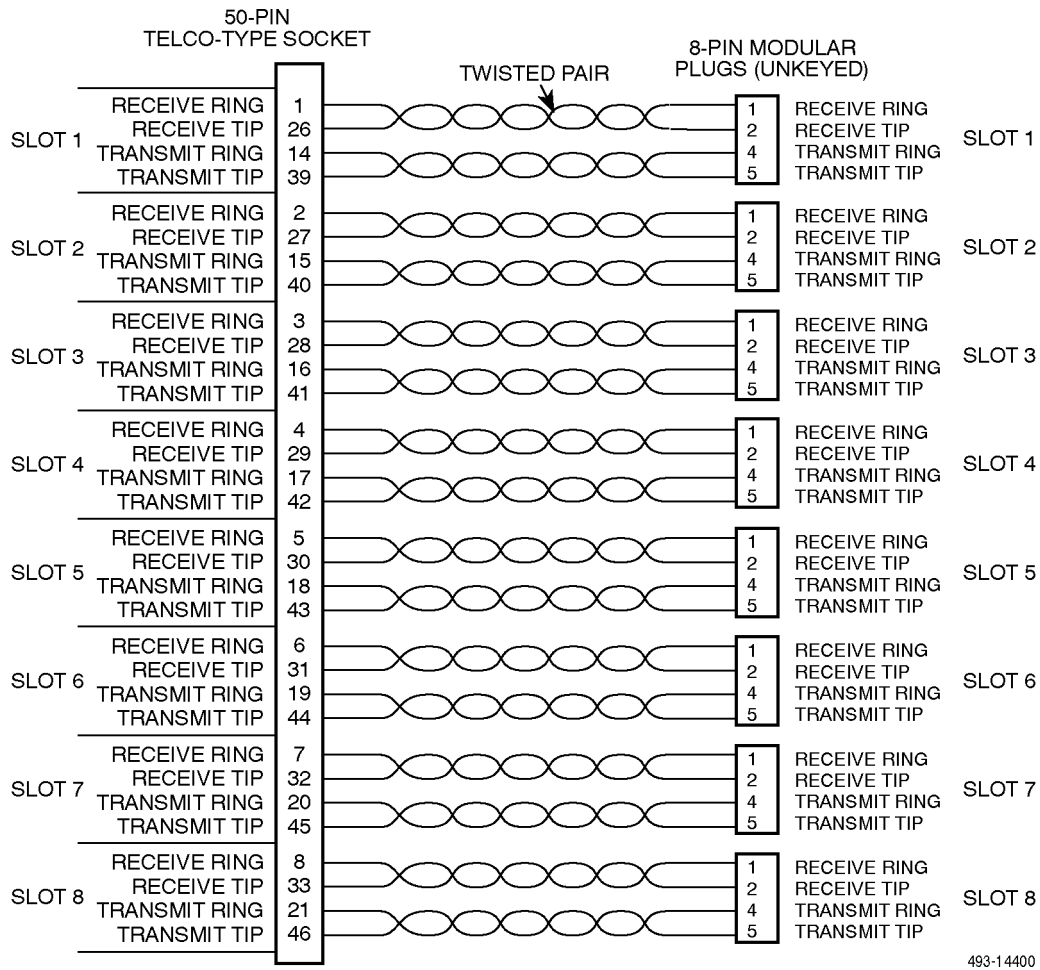


Figure B-3. T1 Network Interface Multiport Adapter with 50-pin RJ48H to 8-pin RJ48C Connectors (Feature Number 3100-F1-930)

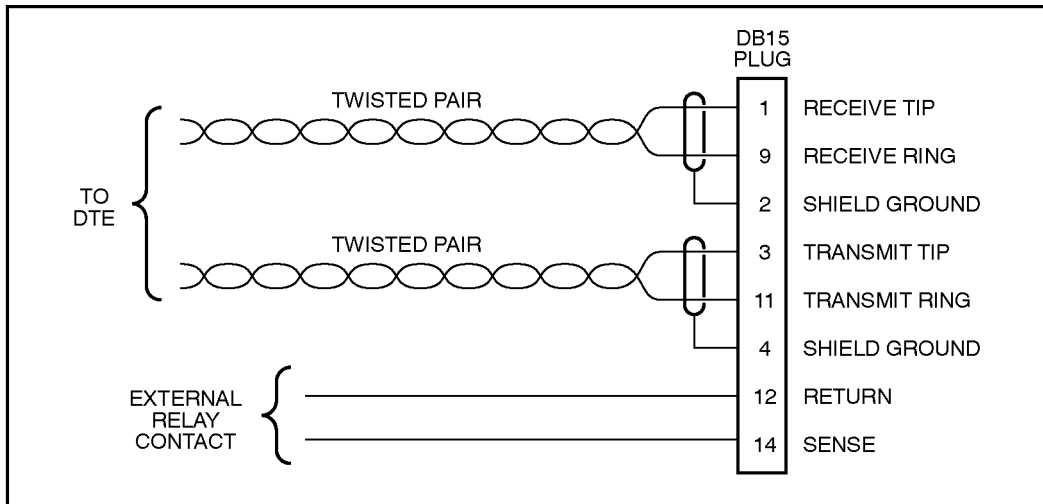
Table B-2
T1 Network Interface Connector (RJ48H)

Signal	Slot	Pin Number
Transmit Ring	1 or 9	14
Transmit Tip	1 or 9	39
Receive Ring	1 or 9	1
Receive Tip	1 or 9	26
Transmit Ring	2 or 10	15
Transmit Tip	2 or 10	40
Receive Ring	2 or 10	2
Receive Tip	2 or 10	27
Transmit Ring	3 or 11	16
Transmit Tip	3 or 11	41
Receive Ring	3 or 11	3
Receive Tip	3 or 11	28
Transmit Ring	4 or 12	17
Transmit Tip	4 or 12	42
Receive Ring	4 or 12	4
Receive Tip	4 or 12	29
Transmit Ring	5 or 13	18
Transmit Tip	5 or 13	43
Receive Ring	5 or 13	5
Receive Tip	5 or 13	30
Transmit Ring	6 or 14	19
Transmit Tip	6 or 14	44
Receive Ring	6 or 14	6
Receive Tip	6 or 14	31
Transmit Ring	7 or 15	20
Transmit Tip	7 or 15	45
Receive Ring	7 or 15	7
Receive Tip	7 or 15	32
Transmit Ring	8 or 16	21
Transmit Tip	8 or 16	46
Receive Ring	8 or 16	8
Receive Tip	8 or 16	33

DSX-1 Port DTE Interface

This cable is typically supplied by a DTE vendor and is a 22 AWG solid, individually shielded twisted pair cable with drain wire (see Figure B-4). The cable connector is a DB15 plug. Be sure to connect the shield ground only at the DSU/CSU end as shown in Figure B-4 to prevent

ground loops. The DTE (DSX-1) interface connector is a DB15-type socket connector (see Table B-3). Refer to the Extn DLB configuration option in the *DTE Interface Options* section in Appendix B of the *ACCULINK 315x Channel Service Unit Operator's Guide* or the *ACCULINK 316x Data Service Unit/Channel Service Unit Operator's Guide* for more information.



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Figure B-4. DTE (DSX-1) Cable

Table B-3
DTE (DSX-1) Interface Connector (J3)

Signal	Pin Number
Receiver Tip from DTE	1
Receiver Ring from DTE	9
Transmitter Tip to DTE	3
Transmitter Ring to DTE	11
Relay Contact Sense Return	12
Relay Contact Sense	14
Shield Ground	2, 4

COM Port Interface

The COM port connects to either a PC or to an ASCII terminal or printer. The COM port-to-PC cable is a 14-foot, 26 AWG, 8-conductor cable with an 8-position modular plug keyed connector and a DB9 socket connector (see Figure B-5). The COM port connector uses a plastic body adapter for converting a DB25 interface to an 8-pin modular jack (see Figures B-6 and B-7). This

connector is used in conjunction with the COM port adapter cable.

The COM port-to-terminal/printer cable is a 14-foot, 26 AWG 8-conductor cable with an 8-position modular plug keyed connector and a DB25 plug connector (see Figure B-8). The COM port adapter connector is an 8-position keyed modular jack (see Table B-4). The data signals on this port are referenced to a DTE interface.

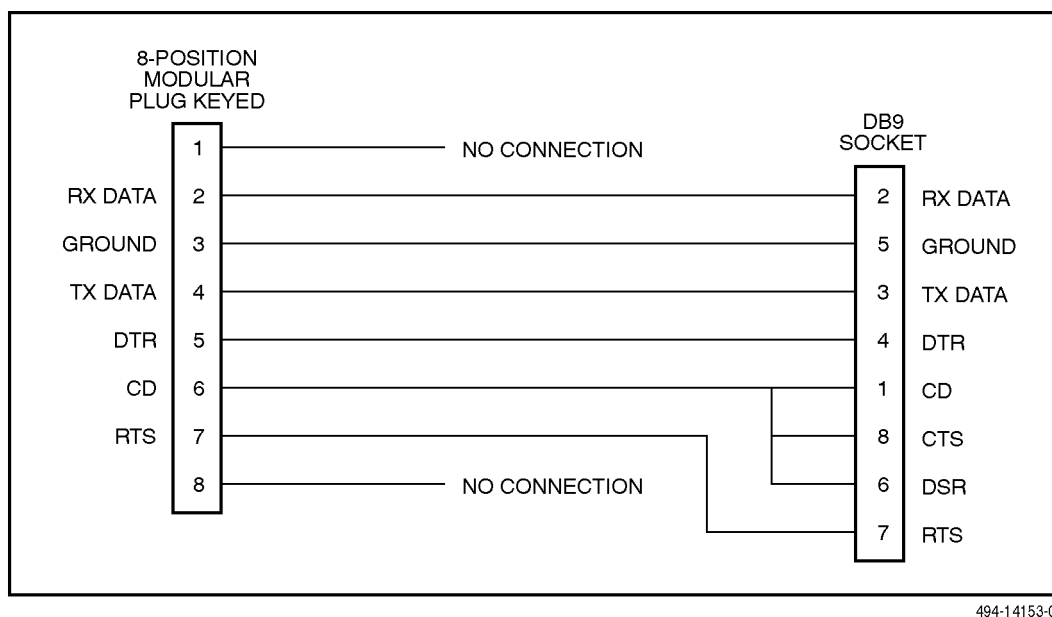


Figure B-5. COM Port-to-PC Cable (Feature Number 3100-F1-550)

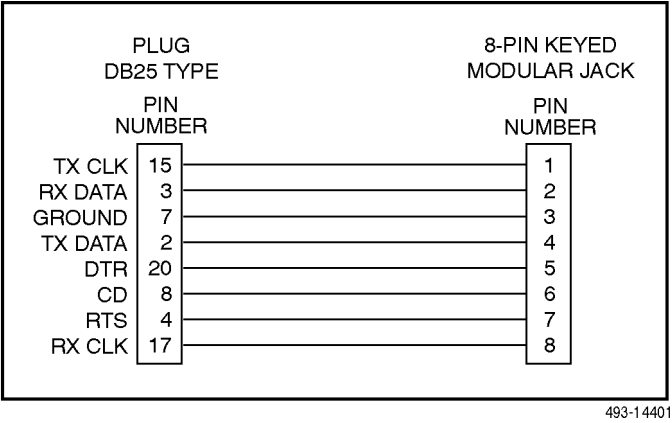


Figure B-6. COM Port-to-PC Adapter (Feature Number 3100-F1-920)

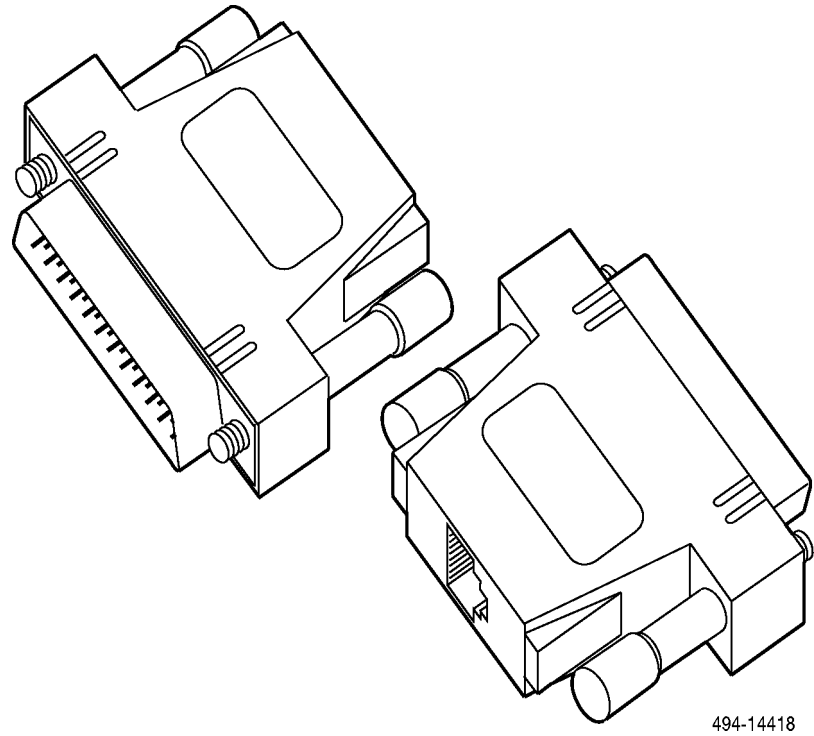


Figure B-7. COM Port Adapter

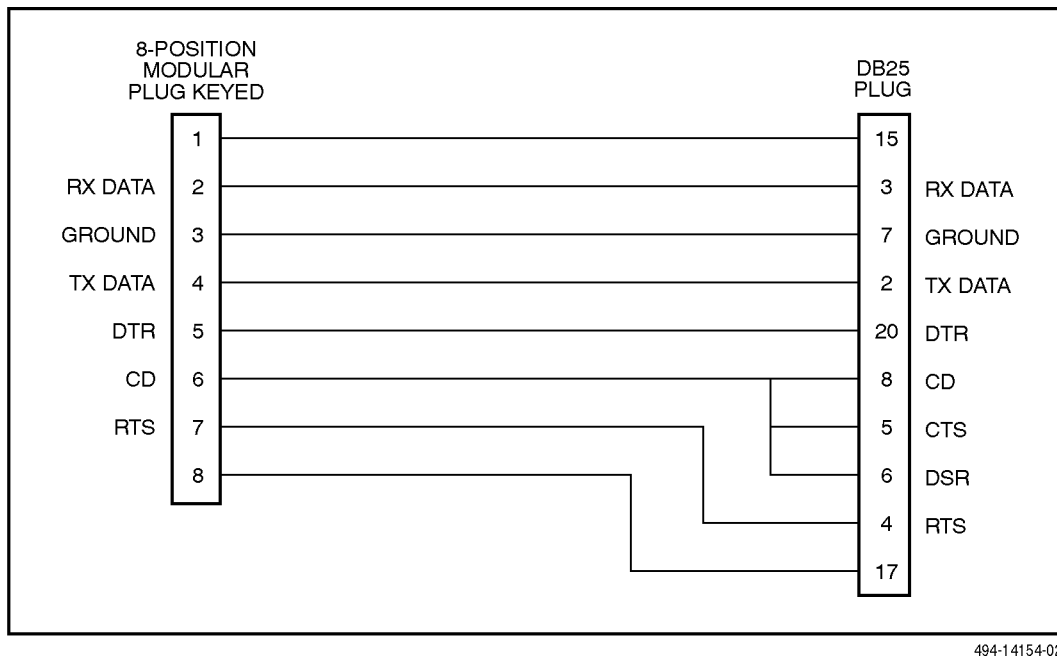


Figure B-8. COM Port-to-Terminal/Printer Cable (Feature Number 3100-F1-540)

Table B-4
COM Port Adapter Connector (J6)

Signal	Direction	Pin Number
Reserved for future use	to DTE (Out)	1
DCE Received Data	to DTE (Out)	2
SIGNAL Ground	—	3
DCE Transmit Data	from DTE (IN)	4
DCE Data Terminal Ready	from DTE (IN)	5
DCE Carrier Detect	to DTE (Out)	6
DCE Request-to-Send	from DTE (IN)	7
Reserved for future use	to DTE (Out)	8

Port Interfaces

The port interface connectors (Model 3161 only) include the EIA-530A DB25 connector. The V.35 connector and the RS449 connector require an adapter cable.

EIA-530A DB25 Port Interface Connector

The EIA-530A Port Interface connector information is shown in Table B-5 and Figure B-9.

Table B-5
EIA-530A Port Interface Connector

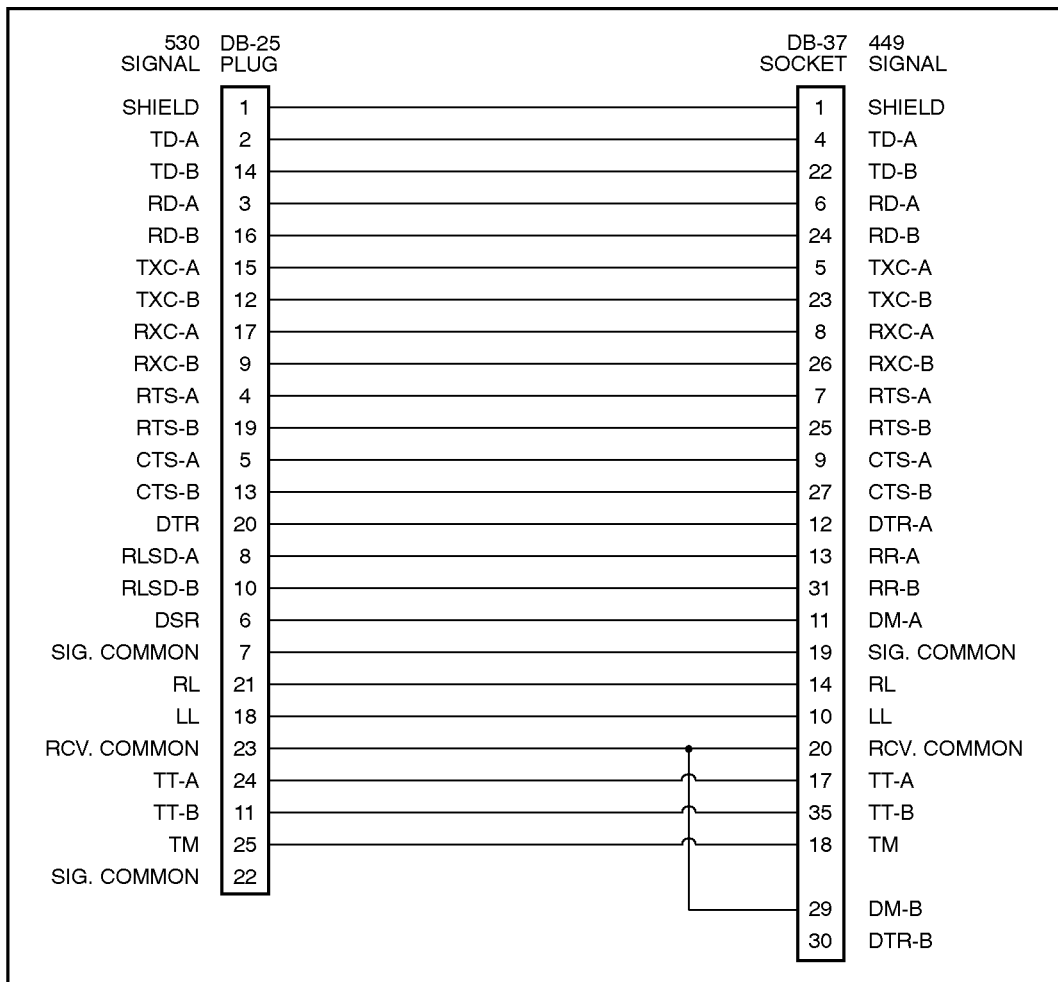
Signal	Circuit Mnemonic	CCITT Number	Direction	Pin
Signal Common	AB	102A	—	7
Signal Common	AC	102B	—	22, 23
Transmitted Data	BA	103	To DCE	2 (A) 14 (B)
Received Data	BB	104	From DCE	3 (A) 16 (B)
Request to Send	CA	105	To DCE	4 (A) 19 (B)
Clear to Send	CB	106	From DCE	5 (A) 13 (B)
Received Line Signal Detector	CF	109	From DCE	8 (A) 10 (B)
DCE Ready	CC	107	From DCE	6
DTE Ready	CD	108/1, /2	To DCE	20
Transmit Signal Element Timing (DTE Source)	DA	113	To DCE	11 (A) 24 (B)
Transmit Signal Element Timing (DCE Source)	DB	114	From DCE	12 (A) 15 (B)
Receiver Signal Element Timing (DCE Source)	DD	115	From DCE	17 (A) 9 (B)
Local Loopback	LL	141	To DCE	18
Remote Loopback	RL	140	To DCE	21
Test Mode	TM	142	From DCE	25

RS449 Port Interface Connector

The RS449 Port Interface connector information is shown in Table B-6 and Figure B-9.

Table B-6
RS449 Port Interface Connector

Signal	Circuit Mnemonic	CCITT Number	Direction	Pin
Shield	—	—	—	1
Signal Ground	SG	102A	—	19
Receive Ground	RC	102B	—	20
Send Common	SC	—	—	37
Send Data	SD	103	To DCE	4 (A) 22 (B)
Receive Data	RD	104	From DCE	6 (A) 24 (B)
Request to Send	RS	105	To DCE	7 (A) 25 (B)
Clear to Send	CS	106	From DCE	9 (A) 27 (B)
Receiver Ready	RR	109	From DCE	13 (A) 31 (B)
Data Mode	DM	107	From DCE	11 (A) 29 (B)
Terminal Ready	TR	108/1, /2	To DCE	12 (A) 30 (B)
Terminal Timing	TT	113	To DCE	17 (A) 35 (B)
Send Timing	ST	114	From DCE	5 (A) 23 (B)
Receive Timing	RT	115	From DCE	8 (A) 26 (B)
Local Loopback	LL	141	To DCE	10
Remote Loopback	RL	140	To DCE	14
Test Mode	TM	142	From DCE	18



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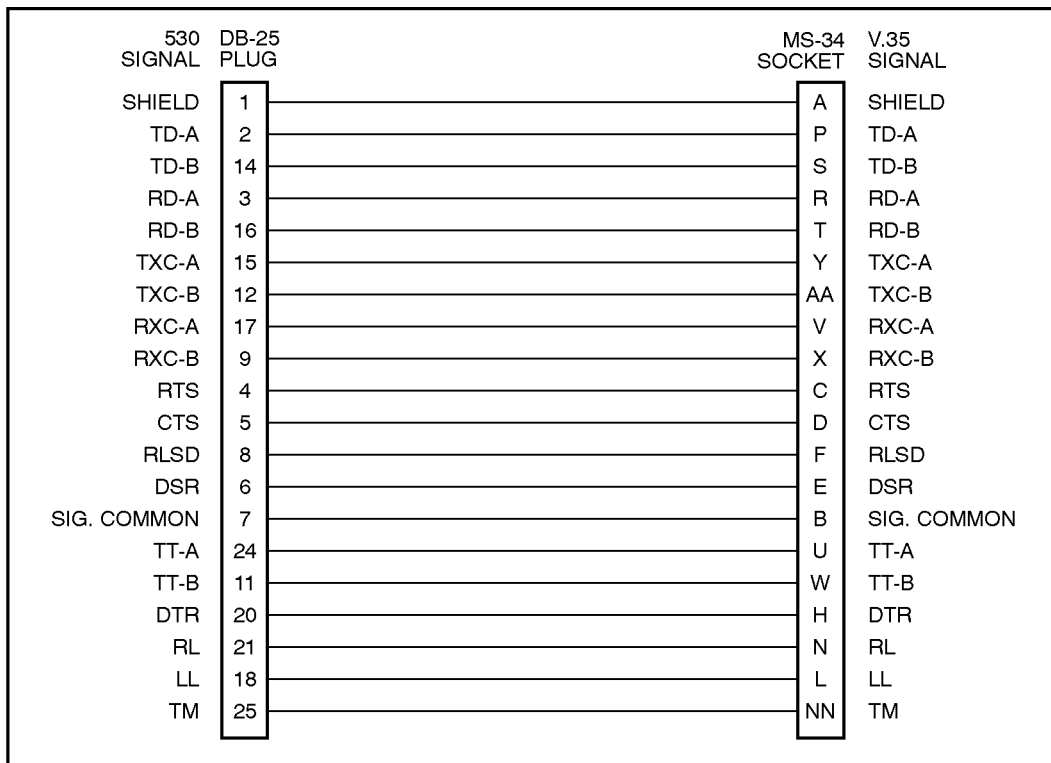
Figure B-9. EIA-530A to RS449 Adapter Cable (Feature Number 3100-F1-580)

V.35 Port Interface Connector

The V.35 Port Interface connector information is shown in Table B-7 and Figure B-10.

Table B-7
V.35 Port Interface Connectors

Signal	CCITT Number	Direction	Pin
Shield	—	—	A
Signal Common	102	—	B
Transmitted Data	103	To DCE	P (A) S (B)
Received Data	104	From DCE	R (A) T (B)
Request to Send	105	To DCE	C
Clear to Send	106	From DCE	D
Data Channel Received Line Signal Detector	109	From DCE	F
Data Set Ready	107	From DCE	E
Data Terminal Ready	108/1, /2	To DCE	H
Transmit Signal Element Timing (DTE Source)	113	To DCE	U (A) W (B)
Transmit Signal Element Timing (DCE Source)	114	From DCE	Y (A) AA (B)
Receiver Signal Element Timing (DCE Source)	115	From DCE	V (A) X (B)
Local Loopback	141	To DCE	L
Loopback/Maintenance	140	To DCE	N
Test Indicator	142	From DCE	NN



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Figure B-10. EIA-530A to V.35 Adapter Cable (Feature Number 3100-F1-570)

External Clock Connector

The External Clock connector cable (Model 3161 only) diagram is shown in Figure B-11. This is a customer-supplied cable. Connector pinouts are in Table B-8.

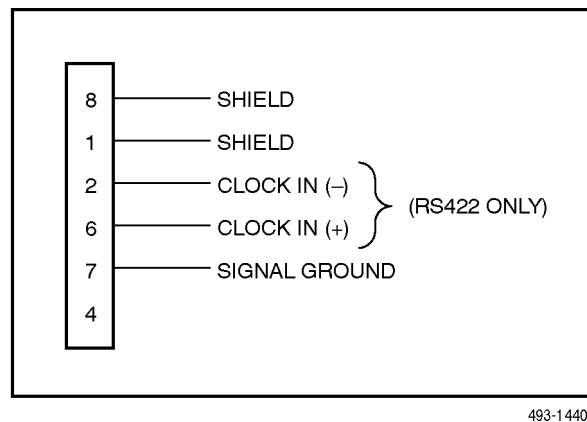


Figure B-11. External Clock Connector

Table B-8
External Clock Connector

Signal	Pin Number
Shield	1, 8
Clock (+) RS422 only	6
Clock (-) RS422 only	2
Signal Common	7

Diagnostic Channel Extension Cable

A 12-inch cable with 8-pin modular plugs at each end is used to connect two Auxiliary Backplanes (see Figures B-12 and B-13).

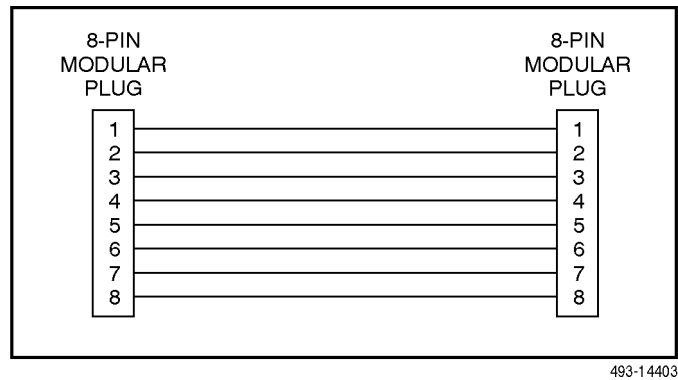


Figure B-12. Diagnostic Channel Extension Cable Connectors

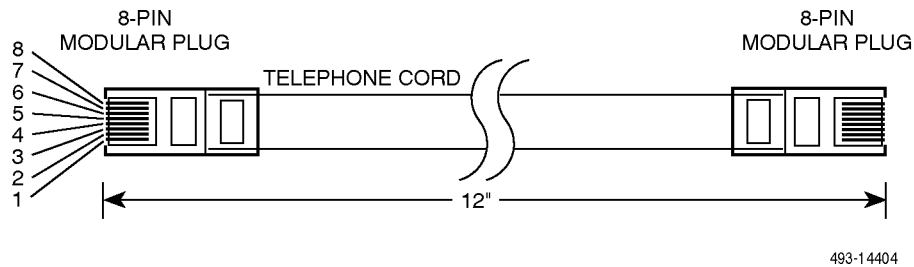


Figure B-13. Diagnostic Channel Extension Cable (Feature Number 3100-F1-910)

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Equipment List C

Equipment	Feature/Part Number	Comcode
Carrier Assembly with		
–48 Vdc Power Unit (includes fan)	3000-B1-501	106459563
100 Vac Power Transformer Unit	3000-B1-601	107073488
115 Vac Power Transformer Unit	3000-B1-201	106779366
230 Vac Power Transformer Unit	3000-B1-301	106789110
230 Vac Power Transformer Unit (UK)	3000-B1-304	—
Included in Carrier Assembly:		
Two Spare Slo-Blo 4 amp Fuses (100 and 115 Vac Power Transformer Unit)	190-0037-0431	—
Two Spare Slo-Blo 2 amp Fuses (230 Vac Power Transformer Unit)	190-0035-0031	—
Cable Ties (6)	650-0001-0433	—
Wire 22 AWG Stranded (.2 feet)	714-0001-2231	—
Ordered Separately by Customer:		
COMSPHERE 72-Inch Cabinet EIA standard 19-inch wide cabinet with 6 inches of interior vertical height for equipment installation.	4000-B2-200	106063571
Spare Power Units		
–48 Vdc Power Module (includes fan)	3000-F1-022	106490766
100 Vac Power Transformer Unit	327-0079-0031	—
115 Vac Power Transformer Unit	3000-F1-200	106238538
230 Vac Power Transformer Unit	327-0080-0031	—
Fan Module		
100 Vac	3000-F1-801	107123572
115 Vac	3000-F1-007	106238496
230 Vac	3000-F1-800	107074854
Shared Diagnostic Control Panel (with ribbon cable)	3000-F1-001	106303274
Models 3811/3911 Speaker Panel	3800-F1-011	106308505
Shared Diagnostic Unit (SDU)	3000-F1-002	106304181

Equipment	Feature/Part Number	Comcode
Rear Connector Plate – 25-Pin EIA-232/25-Pin V.35	3000-F1-021	106476229
Modular DSU V.35 Interconnect Cable (Plug EIA-232/Socket V.35)	3000-F1-510	106476237
Filler Panel	3000-F1-008	106238504
Carrier DBM, DBM-V, or DBM-D Network Interface Module ¹ Permissive (1 per 8 carrier slots) – also for the DBM-D Programmable (1 per 8 carrier slots)	3000-F1-003 3000-F1-004	106303845 106303852
Carrier DDD Network Interface Module NIMs with the Make Busy feature: Permissive (1 per 8 carrier slots) Programmable (1 per 8 carrier slots) NIMs with the Make Busy and Service Line features: Permissive (1 per 8 carrier slots) ² Programmable (1 per 8 carrier slots) NIMS with the Service Line feature: Permissive (1 per 8 carrier slots) Programmable (1 per 8 carrier slots)	3000-F1-010 3000-F1-011 3000-F1-018 3000-F1-019 3000-F1-016 3000-F1-017	106308489 106308505 106597875 106597883 — —
Carrier 4-Wire Switched 56 DBM or DBM-S Network Interface Module	3000-F1-025	106758741
NMS EIA-232 Interface Connector 871A Adapter Central-site 25-pin to 6-pin (873A) Adapter Remote-site Adapter Cables (M6AY and M6BK – 7' and 5', respectively) ANALYSIS Gender Adapter (1') 10-pin to 6-pin Cable (5')	4400-F1-590 4400-F1-594 6821-F1-518 4951-032F 4400-F1-577	106473119 106473150 106261464 105757496 106473208
Straight-In Plug-Socket Mass Termination (50-pin) Cable Right-Angle Plug-Socket Mass Termination (50-pin) Cable	10' — 3000-F1-013 30' — 3000-F1-014 10' — 4400-F1-501 30' — 4400-F1-504	107151797 107151813 106472806 106472814
¹ This NIM type has neither the Make Busy or Service Line Feature. ² This NIM type can be used by any circuit card installed in the carrier.		

Equipment	Feature/Part Number	Comcode
Network Adapter Cables ³		
50-pin to eight 6-pin Modular Network Interface Adapter (Canada Only)	1.5' — 3000-F1-009	106459621
50-pin to eight 8-pin Modular Network Interface (DSU/JM8 Lease) Adapter for Digital or Lease Lines	1.5' — 3600-F2-503	106303837
50-pin to eight 8-pin Modular Network Interface (RJ45S/Programmable) Adapter	1.5' — 3600-F2-504	106459548
50-pin to eight 6-pin Modular Network Interface (RJ11C/Permissive) Adapter	1.5' — 3600-F2-505	106459928
6-Port V.35 Interconnect Cable (26-pin/V.35)	1' — 3600-F3-500	106953508
Multipoint Cables		
TDM 60-pin Plug to five EIA-232 Socket Interface Connectors for multiplexing and digital sharing	6' — 3600-F2-500	106314651
Digital Bridge 60-pin Plug to five EIA-232 Plug Interface Connectors for multipoint dial backup	6' — 3600-F2-501	106315294
Telephone Cord 6-pin Modular RJ11C/Permissive DDD (PSTN) Plug	7' — 4400-F1-531 25' — 4400-F1-533	106472913 106472921
Telephone Cord 8-pin Modular RJ45S/Programmable DDD (PSTN) Plug	2.5' — 4400-F1-541 14' — 4400-F1-543 25' — 4400-F1-544	106472947 106472962 106472970
NMS 6-pin Modular Cable	3' — 4400-F1-510 10' — 4400-F1-511 25' — 4400-F1-512	106472830 106472848 106472855
NMS Adapter Cable/Diagnostic Extension	1.5' — 3000-F2-510	106768690
<i>COMSPHERE 3000 Series Carrier, Installation Manual</i>	3000-M3-001	—
<i>COMSPHERE —48 Vdc Central Office Power Unit, Installation Manual</i>	3000-A2-GB41	—
<i>COMSPHERE 3550 Series Data Service Units, Models 3550 and 3551, User's Guide</i>	3550-A2-GB20	—
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Operator's Guide</i>	3600-M1-001	106314636
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, Applications Guide</i>	3600-M1-002	064654461
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, Applications Guide</i>	3600-M1-003	106465438
³ These adapter cables are extended using a 4400-F1-501/504 or 3000-F1-013/014 cable.		

Equipment	Feature/Part Number	Comcode
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, User's Guide</i>	3600-M1-005	107149064
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, User's Guide Supplement</i>	3600-M1-006	107149122
<i>COMSPHERE DualFlow Data Service Units, Models 3615 and 3616, User's Guide</i>	3615-A2-GB20	—
<i>COMSPHERE 3800 Series Modems, Models 3810, 3811, and 3820, User's Guide</i>	3800-M1-005	—
<i>COMSPHERE 3900 Series Modems, Models 3910 and 3911, Point-to-Point/Multipoint, Installation and Operation Manual</i>	3900-M1-900	107047342
ACCULINK Model 3151 CSU and Model 3161 DSU/CSU		
Model 3151 CSU	3151-B2-010	107336620
Model 3161 DSU/CSU	3161-B2-010	107336588
Auxiliary Backplane	3100-F1-900	107170409
T1 Network Interface Multiport Adapter, 50-pin socket to eight 8-pin modular plugs (RJ48H-RJ48C), 30"	3100-F1-930	107200313
Diagnostic Channel Extension, D8W 8-pin modular plug to 8-pin modular plug, 12"	3100-F1-910	107200339
COM port adapter, DB25 plug to 8-pin modular jack, 2"	3100-F1-920	107200321
COM port to terminal adapter cable, DB25 plug to 8-pin modular plug, 14'	3100-F1-540	406941534
COM port to PC adapter cable. DB9 socket to 8-pin modular plug, 14'	3100-F1-550	406941542
EIA 530A-to-V.35 cable, 12"	3100-F1-570	107116543
EIA 530A-to-RS449/422 cable, 12"	3100-F1-580	107116550
<i>ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide</i>	3100-A2-GK40	—
<i>ACCULINK 315x Channel Service Unit Operator's Guide</i>	3150-A2-GB21	—
<i>ACCULINK 316x Data Service Unit/Channel Service Unit Operator's Guide</i>	3160-A2-GB21	—

Equipment*	Part Number
Carrier Assembly (with backplane)	3000-B1-201
Carrier Backplane	870-1580-5000
Ferrite Choke	175-0018-0031
Line Cord 18/3 Conductor	125-0007-0031
Carrier Assembly with	
–48 Vdc Power Unit	
Power Supply Tray Assembly (with fan)	870-1684-0011
Power Supply (with fan)	870-1637-0011
Power Unit Backplane	870-1642-5000
Air Filter (UAF-263)	713-0001-0031
100 Vac Power Transformer Unit	
Fan Module	022-0031-0331
Power Transformer Unit	869-2291-0011
115 Vac Power Transformer Unit	
Fan Module	022-0031-0031
Power Transformer Unit	870-1588-0111
230 Vac Power Transformer Unit	
Fan Module	022-0031-0431
Power Transformer Unit (220/240 Vac)	869-2276-2111
Cable Ties (6)	650-0001-0433
Wire 22 AWG Stranded (.2 feet)	714-0001-2231
Shared Diagnostic Control Panel (with ribbon cable)	870-1835-574-8xxx
SDCP Ribbon Cable	835-1123-0011
LCD (16 characters by 2 lines) with Cable	153-0009-1131
Membrane Switch	631-0014-0031
Model 3811/3911 Speaker Panel	869-2250-0011
Shared Diagnostic Unit (SDU)	870-1575-8xxx
Rear Connector Plate – 25-Pin EIA-232/25-Pin V.35	869-2211-0011
Ferrite Choke	175-0018-0031
Filler Panel	3000-F1-008

* For use by AT&T Paradyne Field Service personnel.

Equipment*	Part Number
Carrier DBM, DBM-V, or DBM-D Network Interface Module ¹ Permissive (1 per 8 carrier slots) – also for the DBM-D Programmable (1 per 8 carrier slots)	870-1581-8100 870-1582-8100
Carrier DDD Network Interface Module NIMs with the Make Busy feature: Permissive (1 per 8 carrier slots) Programmable (1 per 8 carrier slots) NIMs with the Make Busy and Service Line features: Permissive (1 per 8 carrier slots) ² Programmable (1 per 8 carrier slots) NIMS with the Service Line feature: Permissive (1 per 8 carrier slots) Programmable (1 per 8 carrier slots)	870-1583-8xxx 870-1584-8xxx 870-1629-8xxx 870-1630-8xxx 870-1632-8xxx 870-1633-8xxx
Carrier 4-Wire Switched 56 (DBM-S) Network Interface Module	870-1673-5000
NMS EIA-232 Interface Connector 871A Adapter Central-site 25-pin to 6-pin (873A) Adapter Central-site Cable (50') Remote-site 25-pin to 6-pin Adapter 10-pin to 6-pin cable – M6BK (5') ANALYSIS Gender Adapter (1')	002-0026-0031 002-0025-0031 035-0145-5031 035-0185-5031 035-0106-0531 835-4507-1011
Straight-In Plug-Socket Mass Termination (50-pin) Cable – B25A	10' — 035-0254-1031 30' — 035-0254-3031
Network Adapter Cables ³ 50-pin to eight 6-pin Modular Network Interface Adapter (Canada Only) 50-pin to eight 8-pin Modular Network Interface (DSU/JM8 Lease) Adapter for Digital or Lease Lines 50-pin to eight 8-pin Modular Network Interface (RJ45S/ Programmable) Adapter 50-pin to eight 6-pin Modular Network Interface (RJ11C/ Permissive) Adapter	1.5' — 035-0258-0231 1.5' — 035-0256-0231 1.5' — 035-0257-0231 1.5' — 035-0255-0231
Multiport Cables TDM 60-pin Plug to five EIA-232 Socket Interface Connectors for multiplexing and digital sharing Digital Bridge 60-pin Plug to five EIA-232 Plug Interface Connectors for multipoint dial backup	6' — 035-0101-0631 6' — 035-0102-0631
¹ This NIM type has neither the Make Busy or Service Line Feature. ² This NIM type can be used by any circuit card installed in the carrier. ³ These adapter cables are extended using a 035-0156-1031/3031 or 035-0254-1031/3031 cable.	

* For use by AT&T Paradyne Field Service personnel.

Equipment*	Part Number
Telephone Cord 6-pin Modular RJ11C/Permissive DDD (PSTN) Plug – D4BU	7' — 035-0274-0731 25' — 035-0274-2531
Telephone Cord 8-pin Modular RJ45S/Programmable DDD (PSTN) Plug – D8W	2.5' — 035-0116-0231 14' — 035-0116-1431 25' — 035-0116-2531
Modular DSU V.35 Interconnect Cable (Plug EIA-232/Socket V.35)	1' — 035-0135-0031
6-Port V.35 Interconnect Cable (26-pin/V.35)	1' — 035-0174-0031
NMS 6-pin Modular Cable	3' — 035-0145-0331 10' — 035-0145-1031 25' — 035-0145-2531
NMS Adapter Cable/Diagnostic Extension	1.5' — 035-0173-0031
<i>COMSPHERE 3000 Series Carrier, Installation Manual</i>	3000-A2-GA31
<i>COMSPHERE –48 Vdc Central Office Power Unit, Installation Manual</i>	3000-A2-GB41
<i>COMSPHERE 3550 Series Data Service Units, Models 3550 and 3551, User's Guide</i>	3550-A2-GB20
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Operator's Guide</i>	3610-A2-GB91
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, Applications Guide</i>	3610-A2-GN32
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, Applications Guide</i>	3610-A2-GB41
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Dial Backup Module and SNA Diagnostic Interface Options, User's Guide</i>	3610-A2-GB46
<i>COMSPHERE 3600 Series Data Service Units, Models 3610 and 3611, Time Division Multiplexer, Multichannel Multipoint, and Digital Bridge Options, User's Guide Supplement</i>	3610-A2-GB48
<i>COMSPHERE DualFlow Data Service Units, Models 3615 and 3616, User's Guide</i>	3615-A2-GB20
<i>COMSPHERE 3800 Series Modems, Models 3810, 3811, and 3820, User's Guide</i>	3810-A2-GB91

* For use by AT&T Paradyne Field Service personnel.

Equipment*	Part Number
<i>COMSPHERE 3900 Series Modems, Models 3910 and 3911, Point-to-Point/Multipoint, Installation and Operation Manual</i>	3910-A2-GN32
ACCULINK Model 3151 CSU and Model 3161 DSU/CSU Model 3151 CSU Model 3161 DSU/CSU Auxiliary Backplane T1 Network Interface Multiport Adapter, 50-pin socket to eight 8-pin modular plugs (RJ48H-RJ48C), 30" Diagnostic Channel Extension, D8W 8-pin modular plug to 8-pin modular plug, 12" COM port adapter, DB25 plug to 8-pin modular jack, 2" COM port to terminal adapter cable, DB25 plug to 8-pin modular plug, 14' EIA 530A-to-RS449/422 cable, 12" EIA 530A-to-V.35 cable, 12" COM port to PC adapter cable. DB9 socket to 8-pin modular plug, 14' <i>ACCULINK 3151 CSU and 3161 DSU/CSU General Information Guide</i> <i>ACCULINK 315x Channel Service Unit Operator's Guide</i> <i>ACCULINK 316x Data Service Unit/Channel Service Unit Operator's Guide</i>	3151-B2-010 3161-B2-010 3100-F1-900 035-0264-0231 036-0116-0131 002-0069-0031 3100-F1-540 3100-F1-580 3100-F1-570 3100-F1-550 3100-A2-GK40 3150-A2-GB21 3160-A2-GB21

* For use by AT&T Paradyne Field Service personnel.

Glossary

ACCULINK®	An AT&T product family and a registered trademark.
ACCUNET® Spectrum of Digital Services (ASDS)	An AT&T network service offering the alternatives of fractional T1, 9.6, 56 or 64 kbps (clear channel) digital, and analog access to a digital core network.
Advanced Diagnostic protocol (ADp)	The network management protocol used by the COMSPHERE 6700 Series NMS and 6800 Series NMS. It provides diagnostic communication for the network.
Auxiliary Backplane	An 8-slot backplane that fits over one half of the open section of the 3000 Series Carrier. This is a passive assembly that provides interconnect capability between 3151 CSUs and 3161 DSU/CSUs and provides all interface connectors.
backbone network	The primary route from a control DSU or modem to its first tributary when the communications network contains extended controls.
backplane	A common bus at the rear of the COMSPHERE 3000 Series Carrier connecting each circuit card slot to the SDCP and/or SDU. It also distributes low-voltage ac power to each slot.
carrier	The rack mounting that contains 17 slots: 1 control slot and 16 circuit card slots.
carrier-mounted	A DSU or modem that is designed for and is installed in a COMSPHERE 3000 Series Carrier and is used at central-site operations. Up to 16 DSUs or modems can be installed per carrier, with 6 carriers per cabinet.
CCITT	The International Consultative Committee for Telegraphy and Telephony, a committee of the International Telecommunication Union (ITU).
circuit pack lock	A screw lock tab installed over a circuit card's latch release tab to prevent the unit from being removed without a tool. It is used on SDUs, DSUs, dial/lease modems, and filler panels.
COMSPHERE®	An AT&T product family and registered trademark.
connector module	Used with modular DSU-TDM (or DSU-MCMP) circuit cards. A connector module is installed onto the rear of the COMSPHERE 3000 Series Carrier. It contains six DB25 connectors and one 26-pin high-density D-type connector. It functions as an interface between the modular circuit cards and DTEs.
control	A DSU or modem that is, for diagnostic purposes, at the logical head of a hierarchical network. There is only one control per link.

Control Channel (CC)	The diagnostic interface between an NMS and the SDU.
CSA	Canadian Standards Association.
CSU	Channel Service Unit. Protects the T1 line from damage and regenerates the T1 signal.
Data Communication Equipment (DCE)	A device, such as a DSU or modem, that provides an interface between a DTE device and a digital or analog network. (Also called data circuit-terminating equipment.)
DATAPHONE® II	The name of both a family of AT&T NMS products (System Controller, Diagnostic Console, and Network Controller) and the network management protocol used by these products.
Data Service Unit (DSU)	A DCE device that interprets, interfaces, and provides timing and signal control between a DTE device and a digital network.
Data Terminal Equipment (DTE)	A computer or peripheral device, such as a terminal or printer; a data source or sink.
DBM	The dial backup module option for the Model 3611, 3551, and 3616 DSUs. This module is a pair of childboards that attach to the DSU circuit card to provide an alternate data path via a point-to-point telephone call.
DBM-D	A dial backup module (DBM) that provides automatic dial backup and service restoration of failed digital circuit using 2-wire access over 2-wire 56 kbps switched digital services. It is used for multipoint dial backup, where it occupies one slot in the carrier and is connected to a digital bridge, to provide an alternate data path via a point-to-point dial call to a remote DBM when the digital circuit fails. The DBM-D optional Model 3611 DSU feature is composed of two childboards (DBM-D primary core and line interface).
DBM-S	A dial backup module (DBM) that provides automatic dial backup and service restoration of failed digital circuits using 4-wire access over 4-wire 56 kbps switched digital services. It is used for multipoint dial backup, where it occupies one slot in the carrier and is connected to a digital bridge, to provide an alternate data path via a point-to-point dial call to a remote DBM when the digital circuit fails. The DBM-S optional Model 3611 DSU feature is composed of two childboards (DBM-S primary core and line interface).
DBM-V	A V.32 dial backup module (DBM) that provides automatic dial backup and service restoration of failed digital circuits over the public switched telephone network (PSTN). It is used for multipoint dial backup, where it occupies one slot in the carrier and is connected to a digital bridge, to provide an alternate data path via a point-to-point dial call to a remote DBM when the digital circuit fails. The DBM-V optional Model 3611 DSU feature is composed of two childboards (DBM-V primary core and line interface).
DDS	Digital Data Service, such as DATAPHONE Digital Service or ACCUNET Spectrum of Digital Services, that provides digital (not analog) communication circuits.
Diagnostic Channel	A digital interface between a DSU and a modem used to extend diagnostics to the DSU via the modem.

Diagnostic Console	An AT&T DATAPHONE II NMS that uses the DATAPHONE II protocol.
DIP switch	Dual In-line Package switch.
Direct Distance Dialing (DDD)	Telephone exchange service, the public switched telephone network (PSTN), that enables a telephone service user to access telephone lines without operator assistance.
D-lead control	A control signal method which causes the associated modem to go off-hook in the Originate mode. With D-lead control signaling, a single signal lead is associated with each modem. Momentary connection of this lead to common ground actuates the signal.
DMC	Diagnostic MicroComputer. The network management protocol used by AT&T Paradyne ANALYSIS™ 6510 NMS.
DSU	Data Service Unit. Data communications equipment which transmits digital data over a private line. Also used for limited distance communications over the PSTN when a high-speed modem is not needed.
DOC	Canadian Department of Communication.
EIA	Electronic Industries Association. This organization provides standards for the data communications industry to ensure uniformity of interface between DTEs and DCEs.
extended network	The extension of a circuit where the tributary DCEs are connected to an extended control DCE. (Also called a tail circuit or an off-network extension.)
FCC	Federal Communications Commission. Board of Commissioners that regulates all interstate and foreign electrical communication systems that originate from the United States.
IEC	InterExchange Carrier. A company that provides inter-LATA (local exchange carrier) telecommunications services, like AT&T, MCI®, and US SPRINT®. Access to these services can be provided through DDS dedicated channels, T1.5 dedicated access channels, or digital switched access (DSA) channels.
LADS	Local Area Data Set (also called a limited-distance modem).
LATA	Local Area Transport Area. A region served by a local exchange carrier (LEC) that consists of one or more area codes.
LCD	Liquid Crystal Display. A thin sandwich of two sealed glass plates containing liquid crystal material. When voltage is applied, the amount of light able to pass through the glass plates is altered so that messages may be “written” on the display.
LEC	Local Exchange Carrier. A company that provides intra-LATA (local exchange carrier) telecommunications services, like NYNEX or Bell South.
LED	Light-Emitting Diode. A light or status indicator on the control panel that glows in response to the presence of a certain condition (e.g., Alarm).

Make Busy	An additional capability for DDD NIMs. This feature is useful when modems are used in a “hunt” or “rotary” group. The Make Busy feature ties the Tip and Ring signals together so that the modem appears busy. This feature is not used by DSUs with DBMs, but using a NIM with this feature will not affect the DBM’s performance. However, if a NIM is used with this feature, it must be used behind a PBX.
Mode Indicate and Mode Indicate Common (MI/MIC) control	A control signal method which causes the associated modem to go off-hook in the Originate mode. With MI/MIC signaling, two leads are provided, usually via Pins 3 and 6 of an 8-position modular VF connector: Mode Indicate and Mode Indicate Common. Actuation of the signal is by momentary connection of these two leads.
modular circuit card	A DSU or dial/lease modem that contains “gold finger” contacts on the rear edge of the circuit card. A modular circuit card can be removed from the front of the carrier without disturbing DTE cables.
Multichannel Multipoint (MCMP)	A circuit card that enables the support of up to six independent applications over a single multipoint digital facility. The MCMP capability can support up to 40 tributary DSUs, each optioned with an MCMP card.
network address	The customer-assigned diagnostic address of a tributary DSU or modem.
Network Controller	An AT&T NMS that uses the DATAPHONE II protocol.
Network Interface Module (NIM)	The interface provided, up to two per carrier, for the public switched telephone network (PSTN) used by V.32 dial backup modules (DBMs) and dial/lease modems, and for the switched 56 kbps digital service used by the 2-wire and 4-wire Switched 56 DBMs.
Network Management System (NMS)	A set of diagnostic and configuration management tools for a data communication network, consisting of software programs and dedicated computer hardware.
non-modular circuit card	A carrier-mounted circuit card with connectors mounted onto the card. This circuit card type requires that the DTE cables be disconnected before the circuit card is removed from the carrier.
permissive interface	A dial modem operating mode characterized by a fixed output power level of –9 dBm. It is one of two possible modes of operation for DSUs or modems connected to dial lines (see programmable interface).
physical address	The diagnostic address of a control DSU or modem derived from its location in the carrier: its carrier and slot number.
primary core	This is the circuit card that is normally running when power is supplied to the unit. In the case of a DBM-V, DBM-S, or DBM-D, the primary core and the active core are the same.
programmable interface	A dial modem operating mode characterized by an output power level (–12 to 0 dBm) set by a programming resistor in the datajack. It is one of two possible modes of operation for DSUs or modems connected to dial lines (see permissive interface).
PSTN	Public Switched Telephone Network (dial network).

Rear Connector Plate	Used with modular DSUs and modems. A connector plate is installed onto the rear of the COMSPHERE 3000 Series Carrier. It contains two DTE connectors and functions as an interface between the modular DSU or dial/lease modem and the DTE.
Service Line	An additional capability for DDD NIMs. This feature permits an extra dial line to be connected to a COMSPHERE 3000 Series Carrier. It can be used for NIMs or as a backup line when the primary line goes down.
Shared Diagnostic Control Panel (SDCP)	A feature that allows carrier-mounted DSUs and modems to share the same diagnostic control panel. Installed at eye level into one COMSPHERE 3000 Series Carrier, it controls and monitors the DSUs and modems in all the carriers in the cabinet. A single SDCP can control up to 8 carriers, with a total of 128 DSUs (and if present, 128 DBMs) and modems.
Shared Diagnostic Unit (SDU)	A circuit card that plugs into a dedicated slot in the COMSPHERE 3000 Series Carrier to provide the shared diagnostic control panel and network management interfaces to the DSUs in the carrier. It translates the network management protocol to the devices in the carrier and routes incoming messages to the appropriate slots.
Speaker Panel	An optional component that can be installed on the carrier to provide audio monitoring of any Model 3811 or 3911 dial/lease modem.
switched 56 kbps digital service	A service provided by local exchange and interexchange carriers (LECs and IECs) that allow customers to use high-speed switched digital data capability without having to subscribe to private network services.
System Controller	An AT&T DATAPHONE II NMS that uses the DATAPHONE II protocol.
tail circuit	See extended network.
Time Division Multiplexer (TDM)	A circuit card that enables the simultaneous transmission of multiple independent channels (point-to-point only) into a single high-speed outbound data stream. Multiplexing is done by dividing the signal into successive alternate bits.
tributary	A DSU or modem that is, for diagnostic purposes, at a logically subsidiary level in a hierarchical network. Tributary DSUs or modems in a network receive control data from the control DSU or modem, as well as from any network management system present in the network.
UL	Underwriters Laboratories, Inc.
USOC	Universal Service Ordering Codes
6700 Series Network Management System (NMS)	An AT&T Paradyne automated network management system for the Model 3611 DSUs, Models 3811 and 3911 modems, and other devices that allow an operator to monitor network conditions, analyze problems, and take restorative measures from a single personal computer (PC) workstation. This NMS operates in a Microsoft® Windows™ graphic environment.
6800 Series Network Management System (NMS)	An AT&T Paradyne automated network management system for the Model 3611 DSUs, Models 3811 and 3911 modems, and other devices that allows an operator to monitor network conditions, analyze problems, and take restorative measures.

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